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THE IRON AGE

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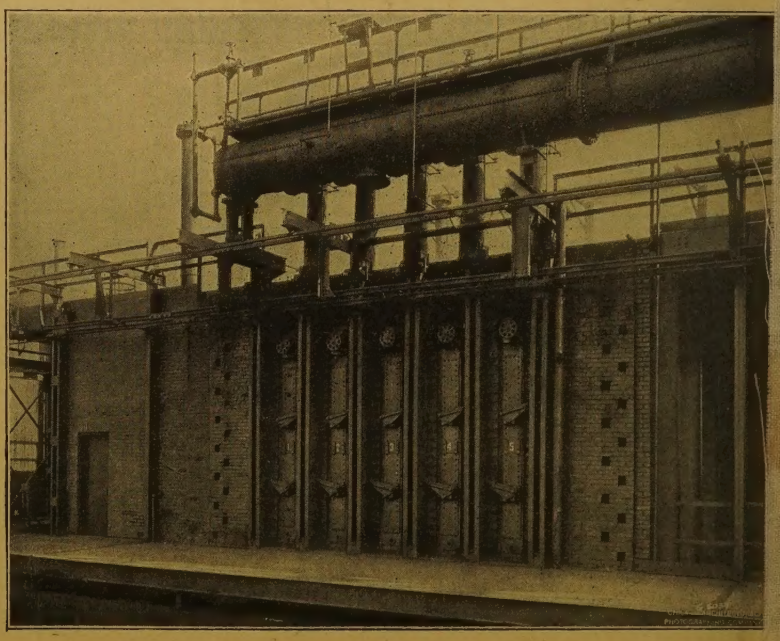

Battery of Five New Koppers Ovens

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THE IRON AGE

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VOL. 110, No. 1

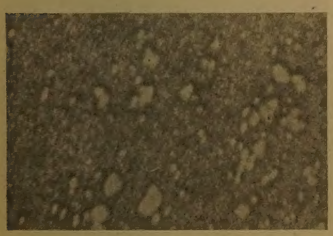
Physical Tests on High-Speed Steels

Transverse and Tenstile Tests of Two Grades Compared—Effect of These Properties on the Service of the Tool

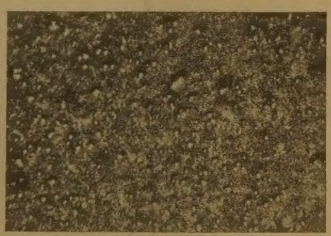
BY A. H. D'ARCAMBAL*

A RECENT search of the literature on high-speed steel showed that very little information had ever been published on the strength of high-speed steel given different heat treatments. Believing that such information was of sufficient value to merit work along these lines, the writer conducted a series of tensile and transverse tests on the two classes of high-speed steel finding the widest use in this country, namely, the 18 per cent tungsten, 1 per cent vanadium-

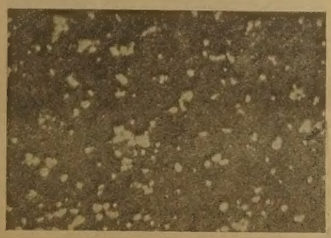
*Chief metallurgist Pratt & Whitney Co., Hartford, Conn.



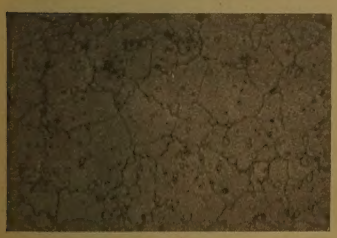
Annealed Condition; Longitudinal Section



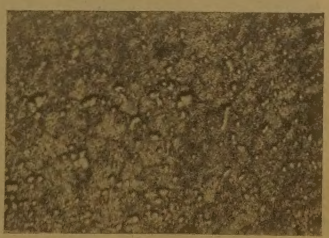
2100 Deg. Fahr.; Oil Quenched; Not Drawn; Cross Section



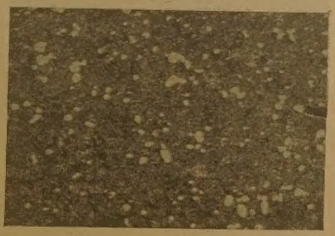
2100 Deg. Fahr.; Oil Quenched; Drawn to 1100 Deg. Fahr.; Cross Section



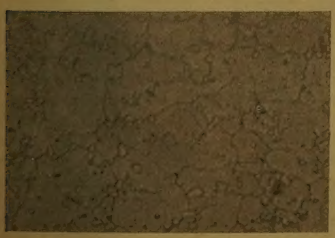
2500 Deg. Fahr.; Oil Quenched; Not Drawn; Cross Section



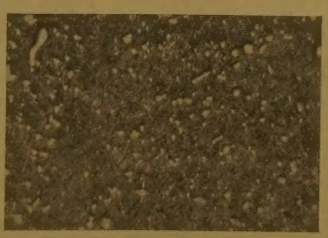
2350 Deg. Fahr.; Oil Quenched; Drawn to 450 Deg. Fahr.; Cross Section



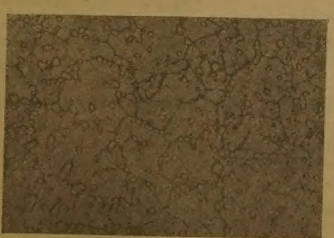
2350 Deg. Fahr.; Oil Quenched; Drawn to 1100 Deg. Fahr.; Cross Section



2350 Deg. Fahr.; Quenched in Lead at 1100 Deg. Fahr.; Then Air Cooled; Not Drawn; Cross Section



2350 Deg. Fahr.; Quenched in Lead at 1100 Deg. Fahr.; Air Cooled; Then Drawn to 1100 Deg. Fahr.; Cross Section



2350 Deg. Fahr.; Quenched in Oil Until Specimen Was Cooled to About 1100 Deg. Fahr.; Then Air Cooled; Not Drawn; Cross Section

Fig. 1.—Photomicrographs on Grade A Transverse Series Reduced About One-Fifth from an Original of 500 Diameters. Samples etched for 3 minutes in 5 per cent nital

Composition of the Steel: Carbon, 0.63; Chromium, 3.55; Vanadium, 0.97, and Tungsten, 17.04 Per Cent

type and the 14 per cent tungsten, 2 per cent vanadium grade.

Transverse Tests

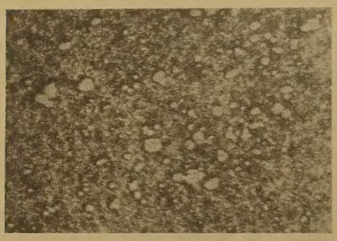
Hot rolled and annealed bars ¾ in. round were used for the transverse specimens, the analysis of the material running as follows:

	Grade A Per Cent	Grade B Per Cent
Carbon	0.63	0.65
Chromium	3.55	3.33
Vanadium	0.97	1.78
Tungsten	17.04	13.85

These bars were cut into seven inch lengths, centered, and turned to 11/16 in. in diameter. They were given the different heat treatments shown in Table I, then carefully ground to 21/32 in. The transverse figures obtained on these different specimens are shown in Table I and the photomicrographs in Figs. 1 and 2. The fractures were also examined, and it was noted that on the specimens of grade B steel quenched from 2350 deg. Fahr. they showed a slight coarsening of the grain; the fractures on the grade B samples quenched from 2100 deg. Fahr. and all of the grade A specimens possessing a velvety appearance. All of these transverse samples were also tested for hardness, using flat temper testing Nicholson XF files. The only specimens too soft to the file were the samples of grade A and grade B steels quenched from 2100 deg. Fahr. and given the 1100 deg. Fahr. draw. One is led to draw the following conclusions from these tests:

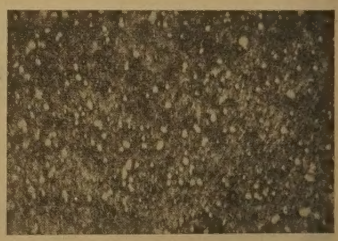
1.—The heat treatment which produced the greatest fiber stress, together with the requisite hardness, was that of quenching from 2350 deg. Fahr. in the lead bath at 1100 deg. Fahr., cooling to room temperature and drawing to 1100 deg. Fahr. Quenching from the high temperature in an oil bath, and drawing to 1100 deg. Fahr., gave almost as high results as the specimens quenched in the lead bath and given the high draw. On tests conducted several months ago, transverse specimens made from high-speed steel similar in analysis to grade A steel, were quenched from 2300 deg. Fahr. in oil and drawn to 1100 deg. Fahr. These specimens gave a fiber stress of 550,000 lb. per sq. in., two and one-half times the strength of the samples from the same bar quenched from the same temperature, but drawn to 450 deg. Fahr. only. I believe that if the A steel specimens, quenched from 2350 deg. Fahr., had been drawn to 1150 to 1175 deg. Fahr., the fiber stress figures obtained would have compared quite favorably with the samples given the 2300 to 1100 treatment. This higher drawing treatment would also have produced the requisite hardness because of the higher quenching temperature (2350 deg. Fahr.).

2.—Specimens of grade A steel, quenched from 2350 deg. Fahr. in oil and not drawn and samples quenched from the same temperature in the lead bath at 1100 deg. Fahr., air cooled and not drawn, showed a fiber stress of only a little more than one-half that of specimens given the same quenching treatment but drawn to 1100 deg. Fahr. Some of the undrawn specimens developed small cracks after grinding, due to the strains in the material. Every specimen made from grade B steel, and quenched from 2350 deg. Fahr. in oil or lead and not drawn, developed so many grinding cracks that they could not be tested. The undrawn specimens of both grades of steel were ground with the utmost care, for from tests conducted in the past, we discovered that the specimens given the high quenching temperature (2300 deg. Fahr.) and not drawn all cracked in grinding. It was impossible, however, to grind all of the undrawn specimens from grade A steel without cracking a few, and we were not able to obtain an undrawn specimen of grade B steel



Annealed Condition; Longitudinal Section

2100 Deg. Fahr.; Oil Quenched; Not Drawn; Cross Section

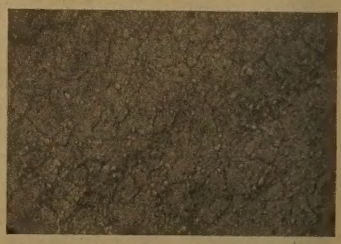


2100 Deg. Fahr.; Oil Quenched; Drawn to 1100 Deg. Fahr.; Cross Section

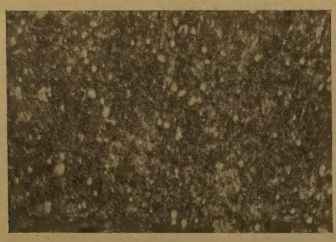
2350 Deg. Fahr.; Oil Quenched; Not Drawn; Cross Section

Fig. 2.—Photomicrographs on Grade B Transverse Series, Reduced About One-Fifth from an Original of 500 Diameters. Samples etched for 3 minutes in 5 per cent nital

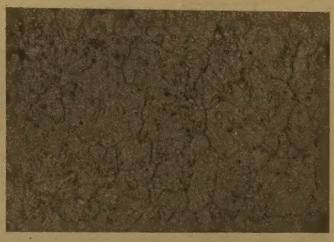
Composition of the steel: Carbon, 0.65; chromium, 3.33; vanadium, 1.78, and tungsten, 13.85 per cent.



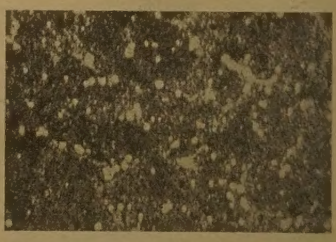
2350 Deg. Fahr.; Oil Quenched; Drawn to 450 Deg. Fahr.; Cross Section



2350 Deg. Fahr.; Oil Quenched; Drawn to 1100 Deg. Fahr.; Cross Section



2350 Deg. Fahr.; Quenched into Lead at 1100 Deg. Fahr.; Then Air Cooled; Not Drawn; Cross Section

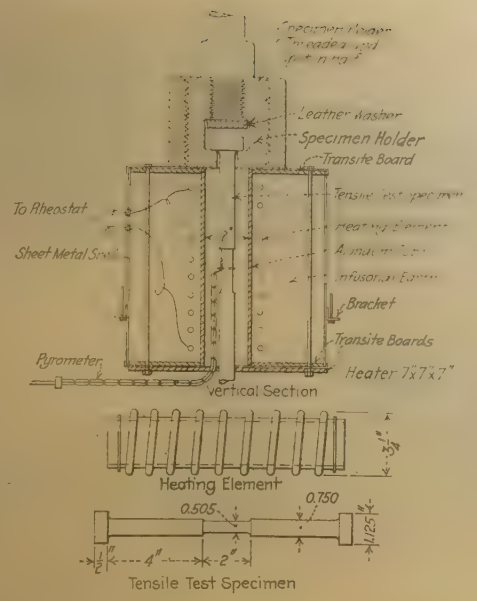


2350 Deg. Fahr.; Quenched into Lead at 1100 Deg. Fahr.; Air Cooled; Then Drawn to 1100 Deg. Fahr.; Cross Section

that was not full of grinding cracks. This high-drawing treatment, therefore, not only produces about double the transverse strength over that of undrawn specimens, but also gives a greater factor of safety in grinding.

3.—Grade B specimens quenched from 2350 deg. Fahr. and drawn to 450 deg. Fahr. and 1100 deg. Fahr., did not possess as high a transverse strength as grade A specimens given the same hardening treatments. It would appear that grade B steel does not stand as high a quenching temperature as grade A steel, for the fracture on the grade B specimens, quenched from the high temperature, showed a slight coarsening of the grain. I believe that grade B specimens quenched from 2300 deg. Fahr. and drawn to 1100 deg. Fahr. would show at least as great a strength as grade A specimens given the 2350 to 1100 treatment.

4.—The micrographs, Figs. 1 and 2, showed that the material as received in the annealed condition was satisfactory. Specimens of both grades of steel quenched from 2100 deg. Fahr. and not drawn possessed a fine grained martensitic structure with free carbides and tungstides. Drawing to 1100 deg. Fahr. produced a small amount of troostite with its corresponding softness. Specimens of both types of steel quenched from 2350 deg. Fahr. in oil or lead and not drawn possessed the polyhedral structure of austenite with only a few undissolved carbides and tungstides. Drawing to 450 deg. Fahr., in case of the A grade, left only a trace of the polyhedral structure, while the B specimens still showed the well developed grain. It would thus seem that the B type of steel requires a higher drawing temperature to produce the same changes in microstructure than is required by the A grade. It is also interesting to note the extremely low fiber stress on the B grade drawn to 450 deg. Fahr. in comparison with the A grade given the same heat treatment. Photomicrographs of both grades of steel, drawn to 1100 deg. Fahr., showed a complete disappearance of the polyhedral structure of austenite, and the development of a full martensitic structure. This structure is the most desirable one, for material possessing this microstructure has the greatest strength, proper hardness, and greatest degree of red hardness.



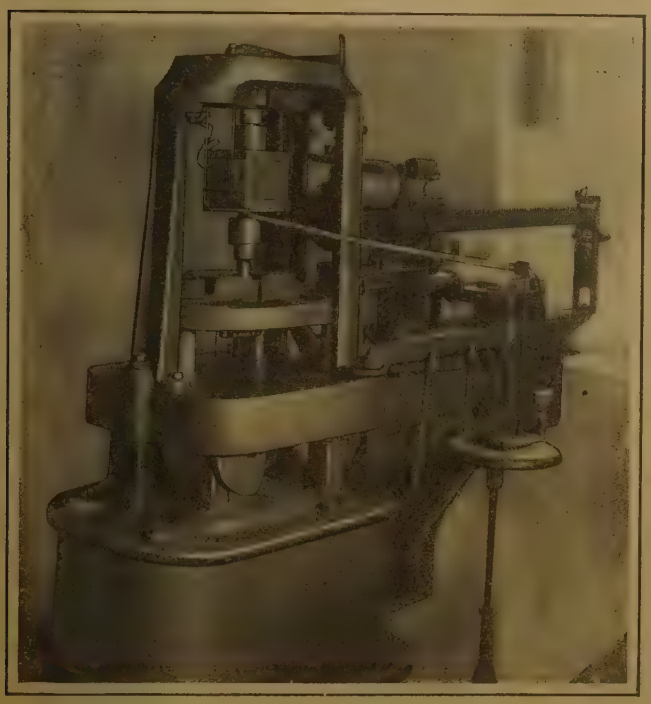


Fig. 3 (Above).—Electric Heater and Test Specimen. Heating element contains 2 coils each containing 56 ft. of No. 22 chromel A wire, connected in parallel, wound around an alundum tube, then covered with alundum cement

Fig. 4 (Left).—Electric Heater in Position on a Standard Testing Machine

Fig. 5 (Below.)—Tensile Test Curves. All specimens were quenched in oil from 2350 deg. Fahr. and drawn to 1100 deg. Fahr. before being tested. Additional tensile tests were:

Grade A High-Speed Steel

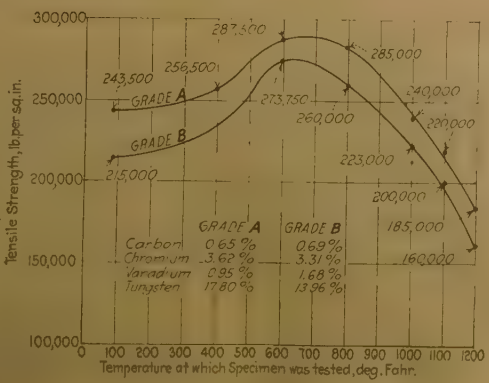
Heat Treatment, Deg. Fahr.	Temp. at Which Tested, Deg. Fahr.	Tensile Strength, Lb. per Sq. In.
2350, oil quenched, not drawn	Room temp.	175,000
2350, oil quenched, not drawn	800	272,000
2350, oil quenched, not drawn	1100	225,000
2350, oil quenched, 450 deg. drawn	Room temp.	185,000

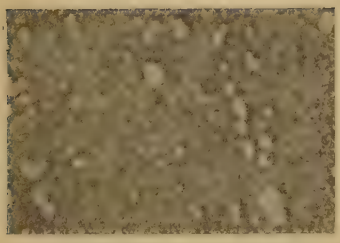
Carbon Tool Steel

1460, brine quenched, 400 deg. drawn	Room temp.	183,500
1460, brine quenched, 400 deg. drawn	1100	65,000

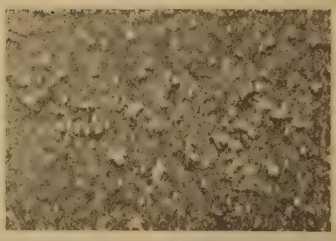
Tensile Tests

Hot rolled and annealed bars of high-speed steel

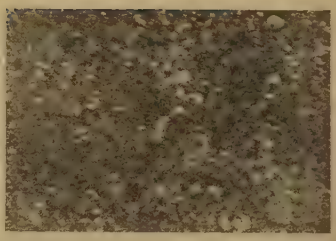




Annealed Condition; Longitudinal Section



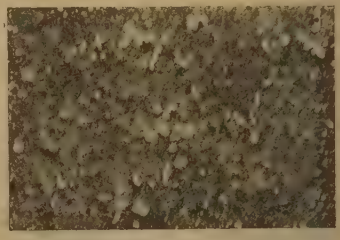
2350 Deg. Fahr.; Oil Quenched; Drawn to 1100 Deg. Fahr.; Tested at Room Temperature; Cross Section



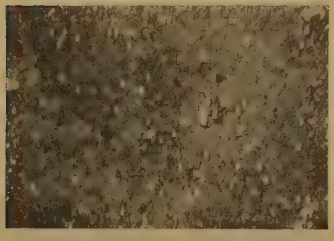
2350 Deg. Fahr.; Oil Quenched; Drawn to 1100 Deg. Fahr.; Tested at 600 Deg. Fahr.; Cross Section

2350 Deg. Fahr.; Quenched; Drawn to 1100 Deg. Fahr.; Tested at 1100 Deg. Fahr.; Cross Section

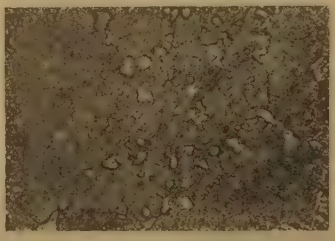
Fig. 6. — Photomicrographs on Tensile Test Series, Grade A Steel, Reduced About One-Fifth from an Original of 500 Diameters. All specimens etched for 3 minutes in 5 per cent nital



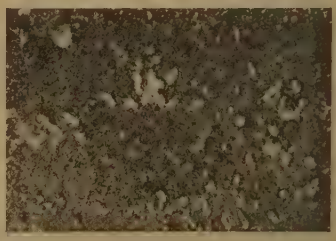
2350 Deg. Fahr.; Oil Quenched; Drawn to 1100 Deg. Fahr.; Tested at 1200 Deg. Fahr.; Cross Section



2350 Deg. Fahr.; Oil Quenched; Drawn to 450 Deg. Fahr.; Tested at Room Temperature; Cross Section



2350 Deg. Fahr.; Oil Quenched; Not Drawn; Tested at 800 Deg. Fahr.; Cross Section



2350 Deg. Fahr.; Oil Quenched; Not Drawn; Tested at 1100 Deg. Fahr.; Cross Section

1 3/16 in., were obtained for the tensile test specimens. These bars analyzed as follows:

	Grade A Per Cent	Grade B Per Cent
Carbon	0.65	0.69
Chromium	3.62	3.31
Vanadium	0.95	1.68
Tungsten	17.80	13.96

The test specimens were made with shoulders instead of threaded ends, for past experience had shown that it was impossible to obtain accurate tensile test results on hardened high speed steel with the standard United States threaded end test pieces, due to the specimens usually failing in the threads.

A large number of these specimens were to be tested at elevated temperatures, so the test specimens were made 11 in. in length in order to allow a sufficient length on each end of the test specimen to extend through the electric heater so as to fit into the especially designed holders. The electric heater, shown in Fig. 3, is quite similar in design to that used by R. S. MacPherran.*

Fig. 4 shows the heater in position on the Tinius Olsen universal testing machine. All specimens were held at temperature for 30 min. before being tested. The results obtained with the various heat treatments, and at the different temperatures tested are shown in Fig. 5. The fractures of the grade A specimens pulled at room temperature all had the usual velvety appearance, but the fractures of the specimens made from grade B steel all showed a coarse, fairly crystalline structure.

I believe that this coarseness was due not only to the high quenching temperature but also to the fact that the material as received in the annealed condition had large lumps of carbide present, which, of course, would not go into solution upon hardening (See Fig. 7). The fractures on the specimens tested at temperatures higher than room temperature presented an interesting range of colors, as is shown in the following chart:

Fracture Colors

Deg. Fahr. at Which Specimen Was Tested	Grade A Steel Color	Grade B Steel Color
Room temp.	Steel gray	Steel gray
400	Steel gray	Steel gray
600	Very dark gray	Very dark gray
800	Chocolate brown	Medium brown
1000	Dark blue	Dark blue
1100	Greenish blue	Greenish blue
1200	Dull purple	Brownish purple

These specimens, after being pulled, were also tested with the flat temper testing files, all of these pieces being hard to the file with the exception of the grade A and B specimens tested at 1200 deg. Fahr., these being filed with difficulty, and the grade A specimens quenched from 2350 deg. Fahr., not drawn, and tested at 800 deg. Fahr. test. The specimens which were drawn to 1100 deg. Fahr., before being tested were file hard after each temperature tested from room temperature to 1100 deg. Fahr.

This illustrates another advantage of the high drawing treatment, for tools in service which have not been drawn quite often attain a temperature of 600 to 1000 deg. Fahr. These tools will, therefore, be very soft, after being cooled to room temperature in comparison with their original hardness, whereas tools drawn to 1100 to 1150 deg. Fahr. before being placed into service will maintain their hardness when cooled to room temperature from any temperature up to the original drawing heat.

Photomicrographs were taken from some of these tensile test specimens and are shown in Figs. 6 and 7. As stated in a previous part of this article, the micro-

*"Comparative Tests of Steel at High Temperatures," R. S. MacPherran, A. S. T. M. 1921 proceedings.

structure of the grade B steel was in a very unfavorable condition as received, due to the presence of large carbide lumps. The structure on the grade A material as received is satisfactory. Specimens drawn to 1100 deg. Fahr. after quenching, and then tested at elevated temperatures, showed the same microstructures as samples given the same treatment but tested at room temperature. This is to be expected for a temperature higher than the original drawing temperature must be exceeded before the martensitic matrix is changed into troostite.

Photomicrographs of the samples of carbon tool steel tested at room temperature and 1100 deg. Fahr. are also shown in Fig. 7. The sample tested at room temperature shows a martensitic matrix with free cementite present, while the samples tested at 1100 deg. Fahr. show a sorbitic matrix with a large amount of free cementite present.

Referring again to Fig. 5, we note that both grades of steel attained their maximum tensile strength at 600 deg. Fahr. The slope of the curve would indicate that the maximum physical properties would have been reached at around 700 deg. Fahr. Unfortunately, we did not have sufficient specimens to run tests at temperatures between 600 and 800 deg. Fahr. Hardened high-speed steel therefore gives the same characteristic curves when tested at elevated temperatures as do plain carbon and alloy steels. The grade B specimens gave lower reading than the type A samples, as would be expected from an examination of the fractures. I believe that drawing specimens of both grades of steel to 1150 to 1175 deg. Fahr., would have produced higher tensile strengths, without sacrificing the hardness to any extent.

Grade A test specimens quenched from 2350 deg. Fahr. and not drawn showed a tensile strength of only 175,000 lb. per sq. in., about 70 per cent of the value obtained on specimens quenched from 2350 deg. Fahr. and drawn to 1100 deg. Fahr. Specimens drawn to 450 deg. Fahr. after being quenched from the high temperature, showed a tensile strength of 185,000 lb. per sq. in. Very little increase in strength is obtained by drawing to only 450 deg. Fahr. Carbon tool steel, given its usual heat treatment, gave a tensile strength of 183,500 lb. per sq. in., tested at room temperature, and 65,000 lb. per sq. in., tested at 1100 deg. Fahr. Carbon tool steel shows a higher tensile strength at room temperature than high-speed steel quenched from 2350 deg. Fahr. and not drawn.

All of the high-speed test specimens were measured for elongation and reduction of area and none was obtained, even on samples pulled at the high temperatures. Hardened high-speed steel therefore possesses zero ductility, even when tested at a red heat.

The following precautions were taken in conducting these tests:

Table I—Transverse Tests of High-Speed Steel

ANALYSIS OF MATERIAL USED

	Grade A Per Cent	Grade B Per Cent
Carbon	0.63	0.65
Chromium	3.55	3.33
Vanadium	0.97	1.78
Tungsten	17.04	13.85

Specimens 0.656 in. in diameter x 7 in. long

Heat Treatment	Approximate Fiber Stress Grade A Lb. per Sq. In.	Grade B Lb. per Sq. In.
2100 deg. Fahr. Oil quenched; not drawn	302,000	330,000
2100 deg. Fahr. Oil quenched; drawn to 1100 deg. Fahr.	460,000	520,000
2350 deg. Fahr. Oil quenched; not drawn	250,000†	*
2350 deg. Fahr. Oil quenched; drawn to 450 deg. Fahr.	308,000	222,000
2350 deg. Fahr. Oil quenched; drawn to 1100 deg. Fahr.	401,000	378,000
2350 deg. Fahr. Quenched in lead at 1100 deg. Fahr.; then air cooled; not drawn	243,000	*
2350 deg. Fahr. Quenched in lead at 1100 deg. Fahr; air cooled; then drawn to 1100 deg. Fahr.	432,000	396,000
2350 deg. Fahr. Quenched in oil until specimen was cooled to about 1100 deg. Fahr.; then air cooled; not drawn	243,000‡	

*Full of grinding cracks, so not tested.

†Few small grinding cracks present.

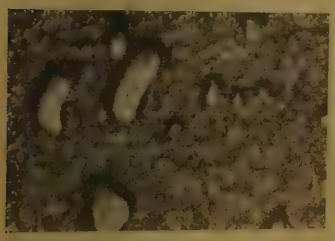
‡Few small grinding cracks present in one of the specimens.

The specimens were all time hardened, so as to insure the heat treatment being a constant.

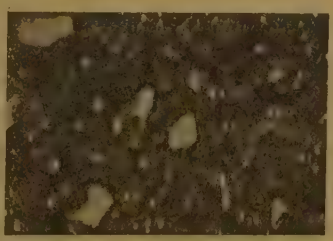
All pyrometers were carefully calibrated before being used.

The accuracy of the testing machine was determined.

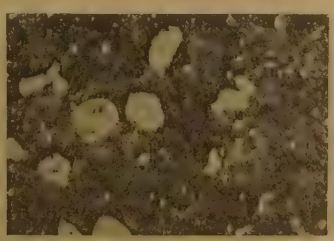
The writer does not wish to convey the impression that the physical strength of high-speed steel is an indication of its cutting qualities, but does believe that tools possessing the proper analysis, hardness and red hardness, together with the highest possible physical strength, will give the most satisfactory service.



Annealed Condition: Longitudinal Section

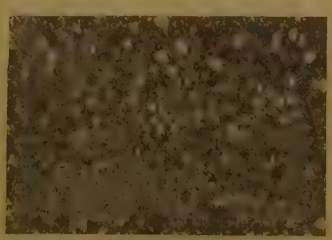


2350 Deg. Fahr.; Oil Quenched; Drawn to 1100 Deg. Fahr.; Tested at Room Temperature; Cross Section



2350 Deg. Fahr.; Oil Quenched; Drawn to 1100 Deg. Fahr.; Tested at 600 Deg. Fahr.; Cross Section

2350 Deg. Fahr.; Oil Quenched; Drawn to 1100 Deg. Fahr.; Tested at 1200 Deg. Fahr.; Cross Section



Carbon Tool Steel: 1440 Deg. Fahr.; Brine Quenched; Drawn to 400 Deg. Fahr.; Tested at Room Temperature; Cross Section

Carbon Tool Steel: 1440 Deg. Fahr.; Brine Quenched; Drawn to 400 Deg. Fahr.; Tested at 1100 Deg. Fahr.; Cross Section

Fig. 7.—Photomicrographs in Tensile Test Series, Grade B Steel, Reduced About One-Fifth from an Original of 500 Diameters. All specimens etched 3 minutes in 5 per cent nital

LARGE AUTOMOTIVE MERGER

Associated Motor Industries, With $80,000,000 Capital, Takes Over 14 Plants

A consolidation of manufacturers of automobiles, trucks and automobile parts, taking in 14 plants in seven states, with capitalization of $80,000,000, has been effected at Dayton, Ohio. The name of the consolidated company is the Associated Motor Industries. Main offices will be in Dayton. All of the plants are owned outright by the new corporation, the merger having been the result of actual purchase rather than transfer of property to a holding company.

Included in the new company are the following companies and plants: National Motor Car & Vehicle corporation, Lockport, N. Y.; Covert Gear Co., Lockport, N. Y., transmission and clutch manufacturer; Recording & Computing Machines Co., Dayton, Ohio, ignition, magneto, starter, battery and generator manufacturer; Jackson Motors Corporation, Jackson, Mich.; Kentucky Wagon Mfg. Co., Louisville, Ky.; Saginaw Sheet Metal Works, Saginaw, Mich.; Traffic Motor Truck Corporation, St. Louis, Mo.; Murray-Tregurtha Corporation, Boston, gasoline engines; H. F. Holbrook Co., New York, automobile bodies.

Officers of the corporation are: Will I. Ohmer, Dayton, Ohio, chairman of the board of directors; Louis Ruthenburg, Dayton, Ohio, president; A. A. Gloetzner, Lockport, N. Y.; Robert V. Board, Louisville, Ky.; T. C. Brandle, St. Louis, Mo., and George M. Dickson, Indianapolis, Ind., vice-presidents.

Directors include the above and the following: James R. Duffin, Louisville, Ky.; H. G. Stoddard, Worcester, Mass.; H. V. Hale, Saginaw, Mich.; H. J. Linkert, Dayton, Ohio; C. L. Halladay, Jackson, Mich.; W. W. Sterling, Jackson; C. L. V. Exselsen, Chicago; Guy Wilson, St. Louis; Buell Hollister, New York; H. F. Holbrook, New York; M. D. Flattery, Boston.

Mr. Ohmer, chairman of the board, made the following announcement regarding the new corporation:

This merger is unique in that it has purchased outright all its plants, instead of being a holding company. The usual thing in such mergers has been a holding corporation and separate operating corporations, the holding corporation owning a majority of the stock, with a full set of officers and each operating corporation having a full set of officers and staff. Associated Motor Industries eliminates all that duplication. The executive officers of the consolidation are the only executive officers of the merger. All the plants will be operated as a unit from the central offices. It is not an imitation of any organization that has gone before it.

As to prosperity, it is here now. We have only to accept it and go ahead with business. So much pessimism has been spread over the country that many people have lost belief in themselves. Associated Motor Industries believes that the time to start up is now. Business is ready right now for people who can make the right kind of goods at the right price.

It is the purpose of Associated Motor Industries to standardize and produce in such quantities as will get the cost of cars of quality within the reach of the people.

There is no question but that a reduction in cost so that prices will come within reach of the consumers' pocketbook must be brought about before there can be a return to "old-time prosperity." The manufacturer must be satisfied with smaller profits. And to be able to reduce the cost and work on smaller profits it is necessary to increase production by the most efficient methods.

As to my employment policies, they are well known and I shall have more to say about them later. I believe in paying people all they can earn, and making it possible for them to enjoy their work.

Women should receive the same pay as men for the same work.

I want employees to feel that they are partners in the business and share in the success of the business.

The interests of the employees of Associated Motor Industries shall have my personal care, and everything possible will be done to make them satisfied and happy.

Production in all of the plants will be started at full speed at once, Mr. Ohmer said.

PROMPT REPLIES

Independent Steel Companies Answer Questionnaire of Commission

WASHINGTON, July 4.—Replies in good-sized numbers are being received by the Federal Trade Commission from independent steel companies to the questionnaire it has sent out to all steel makers of the country in connection with its investigation regarding proposed mergers. The companies proposing to consolidate, including the Bethlehem Steel Co. and the Lackawanna Steel Co., and the Midvale Steel & Ordnance Co., the Republic Iron & Steel Co., and the Inland Steel Co., were the first to make response to the questionnaire. The freedom with which companies not involved in the proposed mergers have replied to the questionnaires apparently is a source of gratification to the commission. The replies, it was stated at the commission, are made complete wherever it is possible to do so.

Reports that the commission in asking for responses from companies not associated with the merger plans is actually attempting, without direction from Congress, to inquire into the entire industry of the country are strongly denied. It is insisted by the commission that, as stated in THE IRON AGE last week, the only purpose of sending out the questionnaire to all of the producers is to ascertain the effect of the contemplated consolidations on competition.

The questionnaire, aside from that portion of it inquiring as to the tonnage the producers sell in the United States and foreign countries, is largely formal and deals with matters that for the most part are already of public record through annual statements, trade papers, commercial publications, etc. The other information sought also is a matter of current knowledge, such as whether products of some companies are sold in the open market or to the parent company and, if both, the percentage of each.

The commission has not as yet taken any action regarding the issuance of a complaint against the Midvale, Republic and Inland companies and has not indicated whether it will or will not issue one. It also has done nothing as to the suggestion of the Bethlehem and Lackawanna companies to the effect that the hearing be set for an early date. It has been stated by the commission that no actual date for the hearing has been set. The fact remains, however, that it was announced in the notice appended to the Bethlehem-Lackawanna complaint that "on the 24th day of July, 1922, at 10:30 o'clock in the forenoon, is hereby fixed as the time, and the offices of the Federal Trade Commission * * * when and where a hearing will be had on the charges set forth in this complaint." It was stated at the offices of the commission that this was intended to mean only that the two companies had until July 24 to make answer to the complaint.

Clay Pipe as Substitute for Cast Iron

As a result of laboratory tests made in the College of Industries of Carnegie Institute of Technology, Pittsburgh, the claim is made by the institute that it has finally been established that bituminous clay pipe for drainage and sewerage use is in every way the equal of the more expensive cast iron pipe which has been employed heretofore. Details can be obtained by addressing R. S. Clark, office of the secretary, Carnegie Institute of Technology, Pittsburgh.

Charles Close, Bureau of Sanitation and Safety, United States Steel Corporation; Major William M. Hoag, National Tube Co., Charles Woolridge, Carnegie Land Co., and R. J. Young, Safety Department Illinois Steel Co., recently visited Gary, Ind., for the purpose of working out a plan for the construction of several hundred additional houses to take care of the employees of the tube plant to be erected there.

Trade Status of Some Minor Steel Products

Facts and Figures Collected by the Tariff Commission Relating to Production and Markets, Also the Export and Import Trade

INFORMATION concerning methods of manufacturing various iron and steel products, and their uses in manufacture and trade, together with data as to imports and exports, also the countries which compete with the United States in the manufacture of these products, is given in a volume of more than 1600 pages. The material in this book was prepared by the United States Tariff Commission for the use of the Senate Committee on Finance in making up the schedules in the pending tariff bill. All the articles in the various schedules are covered, the title of the book being "Summary of Tariff Information, 1921, Relative to the Bill HR 7456." From the sections devoted to the metal schedule the following paragraphs are taken relating to various manufactured forms of iron and steel:

Hoops and Bands Cut to Lengths—Cotton Ties, Etc.

This paragraph applies particularly to the standard cotton tie, a strip of steel 15/16 in. wide by 35/1000 in. thick (20 gage) and 11½ ft. long, chiefly used in tying bales of cotton. Once used, they are rerolled and used again. Production is part of the output of rolling mills making also hoops, wire nails, smooth wire, barbed wire, woven wire fence, bars, spikes, and similar products. Four plants are located in Pennsylvania, one in Georgia, and one in Alabama. The annual production is estimated at 2,000,000 to 3,000,000 bundles of 45 lb. each, approximately two-thirds of the world's output. England and Germany are the principal foreign producers. Imports of hoop or band iron, etc., in 1915 were 1,416,538 lb., valued at $22,552. In 1920 they were 131,370 lb., valued at $5,952, and in the first nine months of 1921 they were 1,055,366 lb., valued at $32,883. Exports are irregular; they depend almost entirely upon the cotton crop and English competition. It is roughly estimated that in recent years they have ranged somewhat over 1,500,000 lb. annually.

Galvanized Wire for Fencing and Wire for Baling Hay

Wire provided for in this paragraph is that used for fencing purposes and for baling hay and other commodities. The fencing wire is limited to galvanized, while the baling wire may or may not be galvanized. Barbed wire is provided for in paragraph 1680, and hence is not included in this paragraph. The country's output of woven wire fencing and poultry netting, plain and coated, in 1919, amounted to 312,150 tons, valued at $30,527,000. In 1914 the corresponding figures were 411,460 tons and $19,795,800. Exports of woven wire fencing since 1917 by calendar years have been as follows: 1918, $1,036,730; 1919, $933,143; 1920, $903,272; 1921 (9 months), $451,823. The principal destinations of this exported material were Cuba, Canada, Mexico, Argentina and New Zealand.

Woven Wire Cloth

Woven wire cloth consists of gauze fabrics, screens, etc., composed of wire with fine meshes and is used largely for straining and for protection against insects and the like. "Fourdrinier wires," or wire cloth used in paper making, are one of the most important items. In the figures of the Federal Census, the country's output of woven wire cloth is included with that of other woven wire products. Excluding woven wire fencing and poultry nettings, the output of woven wire products in the United States in 1919 amounted to 26,610 net tons, valued at $4,274,200. In 1914 the country's output was 22,720 tons, valued at $2,822,700.

Anti-Friction Balls and Bearings

Anti-friction bearings consist of metal balls or rollers fitted between two metal cases in such a way that a shaft may be inserted into the inner case, and the outer case into the bearing frame, the contact between the two cases being through balls or rollers. This arrangement substitutes a rolling contact for the sliding contact of the ordinary bearing and thus reduces friction. The automobile industry is the largest consumer of ball and roller bearings; the bicycle affords examples of the use of ball bearings. Some anti-friction bearings are used in screw jacks, many machine tools, elevators, etc. The domestic industry has gone extensively into both types of bearing—roller and ball. The European industry has given attention chiefly to the ball bearings.

Wheels for Railroad Purposes

The car wheels in general domestic use are either of chilled cast iron, cast steel, or rolled steel. A car wheel made with a cast or forged center piece, about which a steel tire is shrunk, is used to some extent. Locomotive drive wheels are of this type. It has been estimated that 3,000,000 chilled cast iron wheels, valued at $40,000,000, were produced in 1917. According to the 1920 census there were produced in 1919 117,700 gross tons of car and locomotive wheels, rolled or forged, valued at $17,044,700. Pennsylvania has a larger number of manufacturers than any other State; Michigan, New York and Ohio follow. European concerns have not developed the chilled cast iron or rolled steel wheels, which are the predominant types here. The bulk of foreign production has been the steel-tired wheel. Such wheels are likewise made here, and (according to report) before the war could be produced as cheaply as in Europe.

Chains

Structurally, chains made of iron or steel may be divided into (1) those with each link a single piece of metal, and (2) those with each link made of several pieces of metal. The first are used generally for fastening objects together or supporting or lifting weights. Such chains, if small, are chiefly made by machinery, but larger sizes are usually hand-made. Chains for cranes, ships' cables, dredges, etc., have each link welded by hand, often both formed and welded from the rolled bar iron. Those of the second class are known as sprocket or driving chains and are used for transmitting power. In certain of these each link is made of several pieces of metal connected by rivets, bolts, or steel screws, and so formed as to engage with the teeth of a sprocket wheel. The bicycle chain is a familiar example. Stud-like chains are those with a bar or rod across the width of the link. The United States is a large producer of chains made of iron or steel, but statistics are not available. A representative of an important producer estimated the investment in the chain industry in 1918 at $5,000,000 and the country's normal output at $10,000,000.

Bolts, Nuts and Washers

Iron and steel nuts, bolts, washers, spiral nut locks, etc., and their uses are for the most part well known. The word "blank" used in connection with nuts and bolts signifies a piece of metal that has been prepared for manufacture into these various forms. The term "washer" denotes a ring of metal or perforated plate used to distribute pressure to prevent motion or play. Spiral nut locks are special devices for locking a nut, as on a bolt, so that it may not be loosened by jarring. In 1914 the output of bolts, nuts, rivets and washers was valued at $23,403,000, in addition to that of builders' hardware which was valued at $24,280,000.

Horseshoe Nails

The tariff classification embraces horseshoe nails, the product of a distinct industry (the horseshoe nail

manufacturers generally make no other nail product), hobnails and shoe nails to a great extent made in tack mills. Production of horseshoe nails in 1914 was valued at $2,345,762. In 1918 there were six factories located in New York, Connecticut, Pennsylvania, and Illinois. The raw material used is nail rods or wire of soft steel or iron. One company has imported nail rods from Sweden, an important producer of horseshoe nails.

Wire Staples

The census heretofore did not specify wire staples separately. In 1914 the production of wire tacks, brads and staples, made in establishments drawing wire, was valued at $1,324,948. A portion of the product of wire staples is manufactured in the tack mills. In the 1920 Census wire staples figures were separated from those of wire tacks and brads and the 1919 output was shown as 68,221,300 lb., valued at $2,745,000.

Cut Tacks, Brads and Sprigs

Tacks and brads are of two kinds, cut and wire. Cut tacks and brads fall under this designation; those of wire (if of iron or steel) are included under "all other wrought iron and steel nails." "Sprig" is an obsolete word in the trade, formerly applied to sharp-pointed shoe-heel nails. Production of cut tacks and small nails in 1918 was estimated at from 50,000,000 to 60,000,000 lb., valued at approximately $6,600,000. The establishments making cut tacks also manufacture small nails cut from sheets, and to some extent wire tacks. Massachusetts leads in production of cut tacks.

Horse, Mule and Ox Shoes

The factory horse or mule shoe usually requires further working by the horseshoer to fit it to the hoof. Formerly he made the entire shoe from a bar; some shoes are still so produced. Production of horse and mule shoes by rolling mills, etc., was valued at about $9,000,000 in 1914. Hand production from bar iron (not recorded) was very small. In 1917 horse and mule shoes were produced by nine establishments, located in Pennsylvania, Ohio, New York, Illinois, and other States, as their principal or only product. Two large companies (one iron and one steel) are included in this number. Horse and mule shoes are formed by a series of rolling, bending and pressing operations, and, to a lesser extent and at a higher cost, by drop forging. The latter method is used chiefly in France, Belgium and Great Britian. Germany and Canada manufacture by a process similar to ours.

Steel Wool and Shavings

Steel wool consists of long steel fibers resembling curled hair. The fibers are of triangular cross section, and are graded according to fineness from coarse shavings to wool. Steel wool is used as an abrasive, and is a substitute for sandpaper and emery cloth or pumice stone, being regarded as superior to them for certain purposes. It is used in shipbuilding, in other building, in factories, and in the household. No accurate figures of production are available. In 1917 the yearly consumption was estimated at between 1,000,000 and 1,500,000 lb., which (imports being cut off) virtually represented domestic production. Germany and Switzerland are also producers.

Grit, Shot and Sand of Iron and Steel

Grit, shot and iron sand are chilled iron shot made by heating scrap or pig iron to a fluid state and spraying it with steam as it runs into a large vat of water. The grit is used in grinding rough surfaces of granite, marble and other stones. Production figures are not available. Before the war domestic consumption was estimated at 3200 tons. England is an important producer of these abrasives.

Wood Screws

Screws known in the trade as "wood screws," because intended for use in wood, are of mild steel or iron; or of brass, copper, and zinc when protection from rust is desirable. In 1914 wood screws, including those made of brass and bronze, were valued at $6,217,000, the output of twelve establishments. In 1919 the value was $16,462,000, the output of the same number of establishments.

Umbrella Ribs and Tubes

The United States is a large producer of umbrella and parasol ribs and tubes. The value of the annual production is estimated at from $1,250,000 to $2,000,000. Although figures regarding the extent of the output of parts are not available, the production of umbrellas, parasols and canes in 1914 was valued at $13,813,353, and in 1919 at $22,199,000.

Saddlery and Harness Hardware

The phrase "saddlery and harness hardware" is applied to buckles, rings, etc., made of metal and used on bridles, saddles and harness. In 1914 there were 58 establishments in the United States manufacturing saddlery hardware, with an output valued at $4,040,000. In 1919 the number of establishments had declined to 37, but the value of the product had increased to $14,137,000.

Snap Fasteners and Clasps

These articles are fastening devices chiefly for clothing, and are used as a substitute for buttons, hooks and eyes, buckles and pins. In 1914 snap fasteners and clasps, or parts of, amounted to 91,957 great gross, valued at $714,492. Production was estimated by a well-informed manufacturer in July, 1919, to be at the rate of about 1,500,000 great gross annually, valued at approximately $6,000,000.

Metal Buttons

The industry includes practically every kind of metal button, from the most ordinary button of sheet iron, made automatically, to the expensive gold button, made by hand. There are sew-on trouser buttons; tack buttons, put on by machine; bachelor buttons, put on by hand; uniform buttons, and buttons for women's and children's clothing. Connecticut, New Jersey, New York, Massachusetts, and Rhode Island are the leading States in the manufacture of metal buttons. Production in 1914 of steel trouser buttons amounted to 535,207 gross, valued at $307,802; other metal trouser buttons, to 252,248 gross; metal buttons, not including trouser or collar or cuff buttons, to 872,563 gross, at $455,485.

Pins

Production of common or toilet pins in 1914 amounted to 641,121 lb. plus 1,825,673 packs of 3360 pins of steel wire, and 1,186,397 lb. plus 1,638,035 packs of 3600 pins of brass wire, with a combined value of $1,248,757. Some firms report output in pounds and others in packs. Production of hairpins was 9,242,012 gross, valued at $528,362, and of safety pins, 4,744,303 gross, valued at $936,663. Production of common or toilet pins in 1919 amounted to 2,799,000 lb. plus 1,342,000 packs of 3360 pins of steel wire, valued at $1,521,000; and 741,000 lb. plus 1,089,000 packs of 3600 pins of brass wire, valued at $1,269,000. Production of hairpins was 24,310 gross, valued at $1,481,000; and of safety pins, 8,428,000 gross, valued at $2,977,000. The total value of common pins, hairpins and safety pins produced in 1914 was $2,713,782, and in 1919 was $7,248,000. Connecticut leads in the manufacture of articles covered by this paragraph. The leading foreign producers are France, Germany and England.

Pens

The domestic manufacture of steel pens began in 1860, when the knowledge of the quality of metal best adapted for their manufacture was acquired. Most of the steel used has been imported from England and Sweden. Five establishments, with a capital of $870,601 and 573 wage earners, manufactured steel pens in 1914. Materials used were worth $117,113, wages amounted to $243,043, and the value of the product was $513,498. Steel pens valued at $160,068 were also produced by establishments classified under other industries. The value of the product of five establishments in 1919 was $1,706,000. A pre-war estimate credited domestic production with 2,500,000 gross.

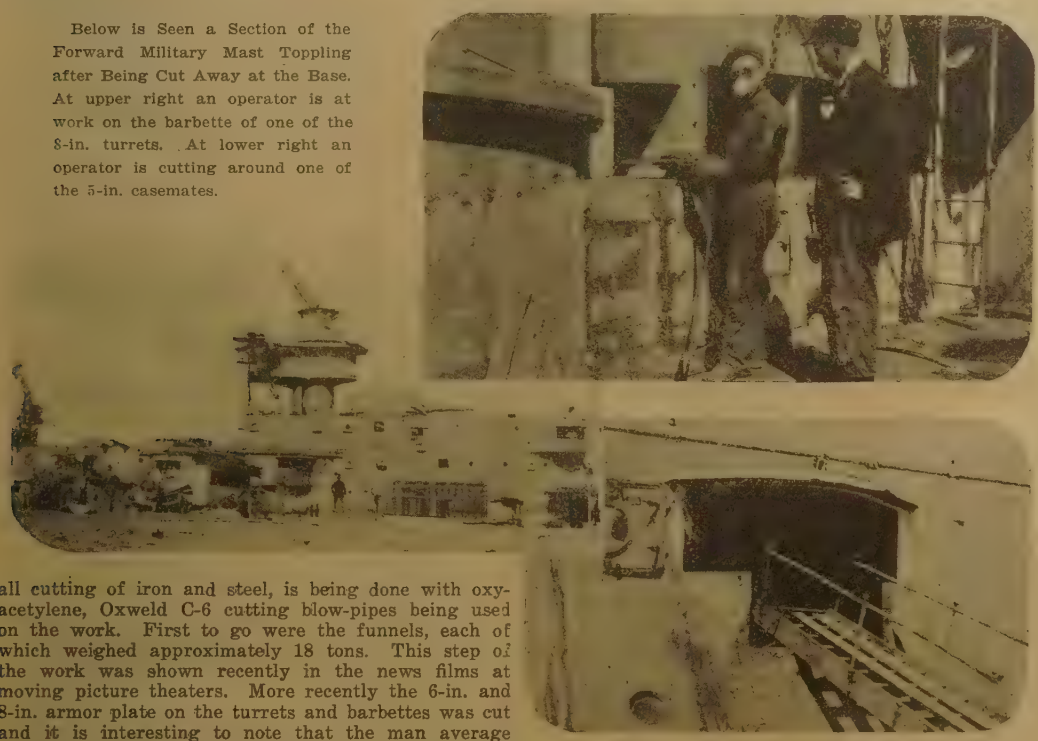
CUTTING CRUISER INTO SCRAP

Ten Feet Per Hour Speed of Advance on Armor Plate with Oxy-acetylene Blowpipe

With the cutting up into junk of the United States armored cruiser Brooklyn, famous as the fighting flagship of Admiral Schley at Santiago, there passes into the limbo of things departed a symbol of the new America. The Brooklyn, constructed at a cost of more than $4,370,000, was sold for $40,000 to a California dealer in scrap metals. It is estimated that the ship will yield 6500 tons of steel, and many tons of copper and brass, besides the miles of copper wire that were used in the electric signalling system. The four main engines, 18,000 hp. in all, will also afford valuable salvage in the form of parts that can be removed without injury and sold for other construction.

The major part of the demolition work, including all cutting of iron and steel, is being done with oxy-acetylene, Oxweld C-6 cutting blow-pipes being used on the work. First to go were the funnels, each of which weighed approximately 18 tons. This step of the work was shown recently in the news films at moving picture theaters. More recently the 6-in. and 8-in. armor plate on the turrets and barbettes was cut and it is interesting to note that the man average per hour on this kind of cutting was approximately 10 lineal feet. This cutting speed was attained with an oxygen pressure of 85 lbs.

In a general way the cutting that is being done on the Brooklyn is typical of the work that is being done not only in the newly created ship-breaking yards in this country, but in those of England and Japan, in the undertaking set on foot at Washington early this year. One picture of the work in progress on the Brooklyn shows a part of the foremast, atilt and about to fall after having been cut at the base of the section. This picture shows also a large supply of oxygen cylinders in the foreground.



Below is Seen a Section of the Forward Military Mast Toppling after Being Cut Away at the Base. At upper right an operator is at work on the barbette of one of the 8-in. turrets. At lower right an operator is cutting around one of the 5-in. casemates.

Federal Trade Commission Personnel

WASHINGTON, July 4.—Judge W. Vernon Van Fleet, of South Bend, Ind., was sworn in last Friday for a term of seven years as a member of the Federal Trade Commission and has assumed his duties. Judge Van Fleet until recently has been special assistant to the Attorney General, giving his attention particularly to re-organization work. He became associated with the Department of Justice in March, 1921. His appointment as a member of the Federal Trade Commission completes the personnel of that organization and is important to the iron and steel industry because of the activities of the commission as they relate to the industry. These include the Pittsburgh base and cost reporting cases as well as the investigation regarding proposed mergers of independent steel companies.

MECHANICAL PUDDLING

Ground Broken for First Unit of a Large Plant of Youngstown Steel Co.

Ground was broken last week by the Youngstown Steel Co., Youngstown, Ohio, for a mechanical puddling plant on a 415-acre site two miles north of Warren in Trumbull county. The initial unit in an extensive construction program, will consist of four machines, with a capacity of 250 tons of puddled iron per 24-hr., and rolling mill complement.

The rolling mill will consist of two stands of 3-high rolls, arranged tandem, and will be furnished by the United Engineering & Foundry Co., Pittsburgh. Rolling mill machinery to be installed at this time will handle up to 1000 tons of iron per day.

A rotary furnace will be installed for mixing the iron. From the time it enters the cupola furnace for melting until it emerges from the rolling mill, all operations will be mechanical. The plant will be fully electrified and will produce its own power. After the puddling operation, the iron will be removed in the form of a ball weighing from 2000 to 2500 lb., and will be pressed into ingot form by a hydraulic press. In this form it will be sent to the heating furnaces and rolled direct into billets, sheet bar or muck bar.

The present installation is merely the beginning of an extensive plant, plans for which have been drawn, to include a total of 16 mechanical puddle furnaces, two 500-ton blast furnaces and auxiliary by product coke ovens. Pig iron will be purchased on the market until blast furnaces are built later. It is planned to operate the initial installation for at least a year before undertaking extensions on any large scale.

The plant will produce a ton of puddled iron every 20 minutes. This compares with an average produc-

tion of 2500 to 2700 lb. by a puddler and helper, working five heats per day. Production costs by the mechanical process are therefore considerably less costly than by the hand-puddled methods now in effect in the majority of plants, and it is claimed the product is of a superior grade. It will be similar to the old-time hand puddled iron. Its corrosive resistance properties are said to be greater than those of steel. The structure of puddled iron is fibrous, instead of crystalline, as is the case with steel.

Present plans do not contemplate any finishing units and the company proposes to market its product in the semi-finished forms mentioned, making the product available for a diversity of uses in pipe, sheets, bar iron for railroad uses and the like. It is expected the first installation will be completed and ready for operation by the first of next year. Construction will be conducted under direction of the company's own organization.

Plans to proceed follow years of intensive experimentation by E. L. Ford, who is a director of the Youngstown Sheet & Tube Co. and a member of the executive committee of the Brier Hill Steel Co. The puddling machines are designed after plans patented by him.

One of the machines was built a number of years ago at the Brier Hill company's plant and has produced some tonnage in trial runs, which has proved satisfactory upon conversion into finished product. This equipment will be transferred to the Warren site and will form part of the new plant.

An office building will be erected at the plant to house the operating departments. At present, the company's principal office is located at 513 Stambaugh building, Youngstown. The company's name is to be changed to more properly conform to its product, while details of capitalization and reincorporation are still to be worked out. Contracts for buildings and electrical equipment for the plant will be awarded in a short time.

Associated with Mr. Ford in the enterprise are T. M. Phillips, general manager of the company, and H. Z. Bixler, chief engineer. Mr. Phillips has been identified with the iron and steel industry in the Mahoning Valley for many years, and previously had charge of blast furnaces and the washed metal plant of the Brier Hill company.

Mr. Bixler was formerly chief engineer of the Brier Hill company, but has been with the Youngstown Steel Co. for the past two years. J. P. Suter, formerly accountant with the Republic Rubber Corporation, Youngstown, is secretary-treasurer.

The company's site at Warren has rail connections with the Erie, Baltimore & Ohio and Pennsylvania railroads. At the start, only a small number of men will be employed.

FRENCH TARIFF CHANGES URGED

Commission Suggests Increased Duties on Hematite Iron, Spiegeleisen, Tool Steel, Hoops and Sheets

(*By Correspondence*)

PARIS, FRANCE, June 15.—The recently published findings of the Departmental Commission for the Revision of customs duties relative to pig iron, has been generally criticized by the French engineering and other steel-using trades, which want to obtain raw and semi-finished materials as cheaply as possible, regardless of origin.

While the pig iron capacity of France since the war is 10 to 12 million tons annually, last year only about three million tons was produced, and this year the increase will probably be only about one million tons. Therefore production in 1921 was only one-fourth and in 1922 probably will be one-third of the total capacity. Producing at full capacity under normal conditions France probably could not consume more than one-half her output.

Therefore, France, which before the war had never been an iron exporting country, is being led by the force of altered circumstances to become one.

But French producers are now meeting with strong competition in foreign markets from Germany—favored by the fall of the mark and by intensive production—as well as from Great Britain, Belgium and Luxemburg, the two last named countries being now economically united, and the French producers are forced to offer foreign purchasers prices often below cost. The inland market is relied upon to make up these losses. But there again producers are confronted by keen Belgian and British competition. Both Belgium and Great Britain, which are receiving the minimum rates of the French tariff, have lately succeeded in exporting to France quite important quantities of hematite pig iron, sheets and plates, and rolled merchant products.

French blast furnaces are now paying for coke (mostly German) 93 fr. ($7.75) per ton at the Franco-German frontier. (There is a refund of 20 fr. per ton ($1.68) on coke used in making export pig iron), while British blast furnaces, for instance, pay about 28s. per ton ($6.16). On the other hand, wages and other charges are higher in France than in Great Britain and in Belgium.

French iron-makers, because of this situation, have asked for an increased tariff protection. The French consuming industries have protested, claiming that if they obtain their raw materials at a low price they can increase their exports of finished products, machinery and electrical goods. The Departmental Commission took a middle course and suggested the following revisions, which have not yet been approved by the government:

Product	New Duty (Fr. per Metric Ton)	Old Duty (Fr. per Metric Ton)
Hematite iron and spiegeleisen	37.50	30.00
Pig iron, other kinds	27.00	30.00
Steel ingots	99.00	76.50
Tool steel, per 100 kg.	52.50	39.00
Other special steels, per 100 kg.	125.00	95.00
Hoops and strip steel, hot rolled, per 100 kg.	13.00	15.60
Hoops and strip steel, cold rolled, per 100 kg.	{ 24.00 39.00	11.20 18.20
Iron and steel sheets, cut, per 100 kg.	{ 11.25 18.00	10.50 16.80

Wages of Puddlers Advanced

YOUNGSTOWN, July 3.—Boiling rate for July-August will be $8.53 per ton, based on a 1.60c. card. This was determined June 28 at the bimonthly examination of sales sheets conducted at the office of James H. Nutt, secretary of the Western Bar Iron Association, Youngstown. Examination of reports of shipments of base sizes of bar iron shipped from April 20 to June 20 by mid-Western mills disclosed an average price of $1.604. This compares with an average of $1.50 per 100 lb. at the settlement two months previously, and represents an advance of two points on the card rate. Puddlers were paid $7.63 per ton in May and June.

The wage rate for boiling will be $8.53 per ton for the reason that the boiling base rate was advanced 50c. per ton, in the new agreement with employees, effective from July 1. Under the agreement which expired June 30, the puddling rate on a 1.60c. card was $8.03. In the new contract, the base puddling rate is increased from $5.50 to $6 on a 1c. card, with a 50c. advance applying at all card points above 1c.

Shipments for the period covered by the settlement showed an appreciable gain as compared with the 60 days ending April 20.

Finishers receive an increase of 4 per cent as a result of the settlement, and will be 28½ per cent above the rates in the scale for July and August.

Employees were represented by officials of the Amalgamated Association of Iron, Steel and Tin Workers, located at Pittsburgh.

Manufactured gas sold in 1920, nearly 500 billion cu. ft., was greater than ever before. The value is estimated by the United States Geological Survey at over $300,000,000.

METAL SCHEDULE COMPLETED

Further Announcements May Be Made, However, Before Tariff Bill is Passed

WASHINGTON, July 4.—The metal schedule of the tariff finally has been completed by the Senate sitting as a Committee of the Whole, but when the bill is presented to the Senate as a body and the parliamentary status permits it, it is expected there will be many amendments offered other than those made by the Senate Committee on Finance itself. While it is not likely that the attacks that will be made on the schedule by Democrats as well as some so-called progressive Republicans will yield any changes of importance, the schedule undoubtedly will be subjected to further sharp criticism, such as was made on it during the past few weeks.

The iron, steel and foundry interests are greatly displeased at the action of the Senate with regard to the duties it has placed on raw materials. At the same time, those who have been urging protection for these materials are gratified at the duties named.

Estimated Increase in Costs

Estimates have been made here that iron and steel costs because of the proposed tariff duties fixed by the Senate on raw materials will be increased by $21,757,962 annually. This compares with $23,805,225, which Chairman John A. Topping of the Republic Iron & Steel Co. estimated they would cost annually in the production of steel. Mr. Topping made his statement as a representative of the independent iron and steel industry before the Senate Committee on Finance in the course of hearings on the metal schedule. His estimate was based upon House duties on ferrosilicon, fluorspar, manganese ore, magnesite, pig tin, and zinc. He appeared in opposition to duties on these products and asked that ferromanganese, if made dutiable, be given no higher rate than pig iron.

Action of the Senate committee in reporting the bill had partly followed suggestions made, particularly in the case of manganese ore, which was made free, ferromanganese, which was given a duty of $2.50 per ton and pig tin which also was made free. But as amended upon the initiative of the committee itself, the Senate as a Committee of the Whole, restored the House duty of 1c. per lb. (of contained manganese) on manganese ore and fixed a duty of 1⅞c. per lb. (of contained manganese) on ferromanganese containing more than 1 per cent of carbon as compared with the House duty of 2 1/5c. per lb. Rates on ferrosilicon were revised downward in the Senate and pig tin was left on the free list, but the duty on fluorspar was increased by the Committee on Finance from the House duty of $5 per ton to $5.60 per ton and the duty of $10 per ton on crude magnesite carried in the House bill was restored by the Senate after somewhat lower rates had been reported by the Committee on Finance.

Mr. Topping's Figures Revised

Iron and steel producers who are opposed to the duties fixed on raw materials, using the duties adopted by the Senate, have revised the figures presented by Mr. Topping which were based on House duties and have made estimates as to increased costs as follows:

	Annual Requirements Tons	Proposed Tax Per Ton	Tax per Annum
Ferrosilicon, 57 per cent	80,000	$25.50	$2,042,200
Fluorspar	300,000	5.60	1,680,000
Manganese ore, 48 per cent	750,000	10.75	8,062,500
Magnesite	150,000	10.00	1,500,000
Zinc (first two years)	†426,986,416	*0.0175	7,472,262
Total			$21,757,962

*Per pound. †Pounds.

The duty determined upon for ferromanganese recalls the statement of Mr. Topping before the Committee on Finance that independent steel interests might form a co-operative company of two or three concerns and put one or two blast furnaces on ferromanganese for joint use:

"And that is what we would have to do if this (House) rate goes through without change, because we could not afford to be at the disadvantage that this bill contemplates placing on us as compared with the cost of manganese per ton of steel made by the Steel Corporation. Should we import our ore and pay the duty you proposed in this bill, and manufacture our own ferro, it will be more economical than to buy our ferromanganese in the open market."

Changes Adopted

The final and important changes made in the metal schedule included the following:

Chain (paragraph 329) not less than ¾ in. in diameter, duty reduced from 1c. to ⅞c. per lb.; less than ¾ and not less than ⅜ in., duty reduced from 1¼ to 1⅛c. per lb., etc.; sprocket and machine chains, duty reduced from 50 per cent to 35 per cent ad valorem; for shovels, spades, etc. (paragraph 373), duty of 35 per cent reported by the committee agreed to.

New paragraph (392B) submitted by Chairman McCumber fixes duty of 60 per cent on twist drills, reamers, milling cutters, taps, dies, and metal cutting tools of all descriptions, not provided for, containing more than 0.6 per cent of tungsten or molybdenum, this action following complaint of tool steel makers that they had been given a duty of only 40 per cent while their raw products had been made dutiable at 60 per cent.

PACIFIC COAST COMPANY

California and Utah Capitalists Plan a $15,000,000 Enterprise

SAN FRANCISCO, June 30.—Announcement is made to-day by Wigginton E. Creed, president of Columbia Steel Co., of the projected organization of a $15,000,000 independent steel and coke company on the Pacific Coast, following the acquisition of extensive coal and iron properties in Utah from the Utah Coal & Coke Co. by the Columbia Steel Co. The new company, which will be organized for the manufacture of steel products and coke as soon as practicable, is being backed by several prominent capitalists of Utah and California. Among the San Franciscans interested are: W. E. Creed, H. D. Grant, A. E. Boynton, Joseph Sloss, W. P. Hammon, John S. Drum, Herbert Fleischhacker of the Pacific Coast Steel Co., Mortimer Fleischhacker and Alfred Esberg. The Utah group includes: W. W. Armstrong, president National Copper Bank of Salt Lake City; L. R. Rains, president Carbon Fuel Co.; Adrian C. Ellis, Jr., A. M. Clark and D. H. Botsford.

The properties being acquired comprise 3120 acres of coal lands and the townsite of 1160 acres near Sunnyvale, Carbon County, Utah, and a number of patented claims covering the iron deposits in Iron County.

For the past eight months those interested have been investigating the possibilities of developing the resources acquired. Although it has been decided to construct a plant for the manufacture of fabricated material, complete plans have not as yet been reached. W. E. Creed makes the following statement: "The Columbia Steel Co. has acquired the coal and iron properties of the Utah Coal & Coke Co., situated in Carbon and Iron counties, Utah. The purchase will be effected through the organization of a new corporation to take over the rolling mills and steel foundries of the Columbia Steel Co. and the assets of the Utah Coal & Coke Co. An intensive investigation, extending over a period

of more than eight months, has demonstrated that the Utah coal and iron properties can be used to form the basis of an independent steel industry for the Coast and Mountain territory. Definite plans have not been matured, except to the point of effecting the purchase and consolidation, but the program for future developments is now being worked out. The West needs the basic industries of iron and steel fully developed, and an unusual opportunity exists for progress in this direction by co-operation by California and Utah."

The building of a blast furnace to supply pig iron to the Columbia and Pacific Coast steel companies is part of the plan of the new company and has been long contemplated.

GERMAN PRICE TREND UPWARD

Export Demand for Machinery and Electric Material—French and Belgian Competition on Pig Iron and Steel

(*Special Correspondence*)

BERLIN, GERMANY, June 14.—The domestic iron and steel market continues active. This is also true of the export market for finished metal goods, machinery and electro-technical articles, but in heavy and semi-finished products there is increased French and Belgian competition, and in pig-iron, for which the domestic demand is great, there is more dependence upon imports from France. The failure of the reparations loan has not affected business in the way predicted. The expectation was that if the loan failed the mark would collapse, and an increased domestic and export boom would result. The mark has, however, so far fallen only a little; and business conditions have on the whole remained unchanged.

Domestic prices are still rising, although at a reduced rate. The *Frankfurter Zeitung's* wholesale commodities index, which is based on 100 for January, 1920, showed for the beginning of June 606, against 584 on May 1. Assertions that Germany cannot compete appear daily in the trade press, but are in general untrue. The *Frankfurter Zeitung* index for twenty-one standard finished products shows a forty-six-fold increase. As the dollar is appreciated about seventy fold, German prices for finished articles are materially lower than in 1914, if expressed in dollars or in gold. The official "Wirtschaft und Statistik" correctly shows that in March, American prices were 154 per cent above German.

Production is increasingly threatened by fuel shortage. The Ruhr coal output in May was 25,000 tons a day less than in March. The Ruhr miners have rejected a Government proposal to do extra work on four days a week, at increased pay. Lack of coal is the main cause of the pig iron shortage. The importing body, the Pig Iron Syndicate (Roheisenverband) is now offering its customers large quantities of Luxemburg foundry iron No. III, at a price of 195 French francs ($16.34) per metric ton, duty paid, delivered on the Lorraine or Luxemburg frontier. At present exchange, this makes less than 5500 m. per ton ($14.85), or below the latest German price of 6133 m. ($16.57) but these imports were contracted for when the mark stood materially higher than now.

Rising Prices for Metal Products

As cabled June 3 (June 8 issue of THE IRON AGE), the "Eisenwirtschaftsbund" again raised pig iron prices, effective June 1. Simultaneously, ferromanganese 80 per cent was raised from 14,415 m. ($38.92) to 15,415 m. ($41.62); 50 per cent from 13,735 m. ($37.08) to 14,400 m. ($38.88) and ferro-silicon 10 per cent from 7750 m. ($20.92) to 8100 m. ($21.87). The reason given was the increase in cost of coal, transport and wages. The Steel Syndicate (Stahlbund) decided on June 8, to make no change in semi-finished products, bars, shapes, wires, plates and rails. [An advance of 12 per cent was made on June 22, as given in THE IRON AGE of June 29, p. 1845.—EDITOR.] The prices of finished metal goods are still rising, though slowly. The Central Association of Electro-Technical Industries lately raised machines and transformers 10 per cent and small articles 20 per cent. The Trade-Screw Association yesterday raised its prices, which had been unchanged since April, by varying amounts, the highest being 6500 per cent above peace rates.

A movement led by Hugo Stinnes, aims to encourage importation of French semi-finished products on a large scale, in order to take care of Germany's finishing industries. The Lorraine mining industry shows nervousness at the decline in German ore buying, fearing that the increased German importation of pig iron is only temporary. The *Journée Industrielle* declares that good relations must be established between French smelters and German pig iron consumers, as the only way to prevent the Thyssen, Kloeckner and other groups re-establishing in Westphalia the great Hagendingen, Kneutingen and other smelting works which passed to France under the peace treaty.

Some Lines Not Prosperous

The market for plates is less satisfactory, sales of heavy plates being damaged by the inactivity in shipbuilding, caused mainly by lack of money. The paper-mark compensation for the shipping companies' war losses agreed on with the Goverment in March, 1921, has largely lost its value through price increases. In thin plates England and Belgium are both underselling Germany, by as much as 2000 m. ($5.40) per ton. The Upper Silesian smelting and rolling mill companies have orders for several months. The small iron and steel finishing branches report reserve by buyers, and complain of shortage of materials. Reports from manufacturers of tools, screws, saws and hammers, and locks and fittings complain of stagnation. A great demand for plates, wire and tubes is noted in Upper Silesia, but the local fuel supply is insufficient. Many Silesian coal miners, fearing worse living conditions under Polish rule, have left the mines.

Labor More Efficient

Favorable data are appearing as to the recovery in labor efficiency. The Prussian factory inspectors report that in some rolling mills, per capita production has risen to 95 per cent of that of 1913; and that one blast furnace which produced 5895 tons of iron a month in 1920 produced (for the same number of employees) 7765 tons in 1921. The Ukrainian Government has been negotiating with German smelting interests to work the manganese mines of the Ukraine; but negotiations were suspended because of the German condition that only high grade ore should be mined. An English counter offer is under consideration. The Austrian Government has leased the Wollersdorfer mechanical works to the General Electricity Co. On these works Austria has been losing at the rate of fifteen billion crowns a year. The term of the concession is fifty years. A company capitalized at one billion Austrian crowns will be formed, Austria receiving one-third of the shares for land, buildings, plant and raw materials in stock, but not ready machines.

GERMAN IRON AGAIN ADVANCES

Higher Coal Prices Force Pig Iron Upward 15 Per Cent On Top of June 1 Advance

BERLIN, GERMANY, June 30.—Another advance in pig iron has been determined on by the Eisenwirthschaftsbund, effective July 1. It amounts roughly to 15 per cent. Prices had been raised 5 to 6 per cent on June 1. Meanwhile the value of the mark is sharply receding and for the moment the dollar equivalent of various grades of iron is as follows: Hematite pig iron, $19.50, foundry No. 1, $18, spiegeleisen, $20.50. Higher coal prices are expected and these will increase automatically the price of iron.

The New Castle, Pa., plant of the Carnegie Steel Co. is now on a 100 per cent basis, with resumption of Rosena or No. 1 blast furnace in the New Castle group. The stack was lighted June 27 with appropriate ceremonies.

American Society for Testing Materials

Annual Convention Discusses Steel Castings and Pig and Cast Iron—Sulphur in Steel—Symposiums on Impact Testing and Fatigue of Metals

FOR many years prior to 1920, the American Society for Testing Materials had held its annual meetings at Atlantic City, N. J., but in 1920 and 1921, Asbury Park, N. J., was the meeting place. The society this year featured its twenty-fifth annual meeting by returning to Atlantic City and previous records for attendance were broken. At the last meeting at Atlantic City in 1919, the record attendance of 692 men and 174 women was made; this year the attendance was estimated at not less than 725 men and 175 women. The meetings were held from June 26 to 30, inclusive, in the spacious auditorium and rooms of the new Haddon Hall Hotel and the technical sessions were distinctly large and enthusiastic. While there were no features of unusual significance, the papers and the reports of the various committees were of the usual high order. Several new tentative specifications, including carbon steel castings for railroads and high-test gray iron castings, were adopted. There was an important symposium on impact testing which made history in this particular subject. An important section of one session was devoted to the fatigue of metals.

Two sessions were devoted entirely to iron and steel matters. The one on steel, which covered also steel castings, was restored to its old place on the program, being held on Wednesday morning. In the program devoted to wrought, cast and malleable iron, specifications for pig iron and cast iron were uppermost topics.

Session on Steel

Three principal topics were discussed at the session devoted to steel, at which Vice-President Guilliaem Aersten presided. The subject to which most of the attention was devoted was the tensile properties of steel castings. Other topics were the effect of sulphur on rivet steel and various methods of testing the welds in butt-welded steel plates.

Because of the fact that part of the report of committee A-1 on steel was the presentation of new specifications for carbon steel castings for railroads, the committee's report was presented in conjunction with a paper entitled "Tensile Properties of Steel Castings" by Lawford H. Fry, Standard Steel Works Co., Burnham, Pa.

New Specifications

New specifications for steel castings for railroads were the result of the work of the joint committee of the American Railroad Association and the American Society for Testing Materials, the final draft having been agreed upon March 24, 1922. The report of the society's representatives on the joint committee was signed by J. C. Davis, fourth vice-president American Steel Foundries, Chicago. It was emphasized that the sub-committee spent a great deal of time on the questions of elastic limit and yield point. It was finally agreed upon by the majority that the yield point by drop of beam or by dividers gave the most uniform results for steel castings and it was decided the yield point should be determined in either of these ways. The specifications also provide that the manganese requirement be placed at a maximum of 0.85 per cent, this concession being made to satisfy the majority of consumers. These specifications will be published later in THE IRON AGE.

Before the adoption of these specifications as tentative, Mr. Fry's paper was presented in abstract by the author. It deals with the tensile properties of steel castings made of grades commonly used for railroad service and is a comprehensive study of the subject. It covered an investigation which involved the examination of about 600 tests from seven manufacturers. In one series of tests, the tensile properties as usually determined are compared to show the relation between strength and ductility, and the relation between yield point and the elastic limit, determined by the method for forgings adopted by committee A-1 on Steel. In a second series, the so-called true elastic limit is compared with the yield point by a series of tests involving much greater precision than usually applied in commercial testing. Complete data of all the tests are given together with charts. The tests were made by a group of manufacturers of steel castings as a contribution to the work of the joint committee on the new specifications for steel castings. The author of the paper was the chairman of the committee and the other members were H. M. Lewis, Pratt & Letchworth Co.; C. N. Ring, Ohio Steel Castings Co.; J. D. R. Stehman, Birdsboro Steel Foundry & Machine Co.; and J. L. Uhler, Union Steel Casting Co. The author stated that the results of the tests show that, with even a moderate degree of precision in the method of measurement, annealed cast steel is found to behave as a plastic rather than an elastic material and that the term "elastic limit" has little meaning.

In the discussion which followed George F. Comstock, Titanium Alloy Mfg. Co., Niagara Falls, N. Y., called attention to the fact that no extensometer had been used in the tests and criticized the use of the Berry strain gage, implying at the same time that the results were not, therefore, scientific. Mr. Fry replied that the use of a more accurate extensometer would not have changed the general results. Prof. H. F. Moore, University of Illinois, Urbana, Ill., reviewed some of the points brought out by the author and stated that, as a result of much of the work done at his laboratories, there was no evidence yet of the existence of any absolute point for the elastic limit.

The new specifications were formally adopted as tentative together with the committees' report as a whole.

Changes in Steel Specifications

The report of the committee A-1 contained also recommendations involving minor changes in standard and tentative standard specifications. These embraced eight proposed revisions in standards and two proposed revisions in tentative standards. During the year, one new sub-committee was appointed as sub-committee XIX on sheet steels. The report announced that 11 specifications have been approved during the year for submission to the secretary-treasurer for transmission to the American Engineering Standards Committee.

Sulphur in Rivet Steel

Some disappointment was evident that there was but little discussion of the preliminary report of the joint committee on the investigation of phosphorus and sulphur in steel, covering in particular the effect of sulphur on rivet steel, presented by the chairman, Dr. George K. Burgess. Supplementing his presentation of the abstract of the report (given in THE IRON AGE of June 22) Dr. Burgess said that the committee's work on rivet steel was practically completed with the exception of a few minor points; that for the investigation on sheets, the steel had been manufactured and tests were being prepared; that the work on grade-B steel had progressed rapidly and tests were nearly completed and that for the investigation on forgings, the steel had been promised. So far as conclusions were concerned covering the report on rivet steel, the committee had felt that, until all the data had been completed and studied, the publication of any conclusions or comments was unwise.

Henry S. Rawdon, Bureau of Standards, Washing-

ton, read an interesting discussion commenting on one of the features of the report involving the effect of heat treatment and notched bar impact test on a low carbon steel containing 0.056 per cent sulphur. He showed that in both the Charpy and Izod tests the fractures varied decidedly as to whether the breaks were through the crystals or not, depending on the heat treatment.

Dr. John S. Unger, director Central Research Bureau, Carnegie Steel Co., Pittsburgh, read a written discussion, the substance of which follows:

For more than 40 years the question of the effect of sulphur in steel has attracted the attention of metallurgists. Much study has been given to this subject, extending so far as to include the several chemical forms or combinations in which it exists, particularly in cast iron.

Within a period of 20 years, the tonnage of steel made by the two principal processes, the Bessemer and the basic open-hearth, has undergone a great change. In 1900 about 65 per cent of the total was Bessemer; in 1920 it was 25 per cent.

With the change in processes came a change in the sulphur content in steel, the average sulphur in Bessemer steel being at least 0.065 against 0.040 per cent in the basic open-hearth. Structures of all kinds built from 20 to 40 years ago of Bessemer steel, are still in service today. Additional evidence is found by making a study of soft, medium and hard steel parts which have worn out in service, giving a good life, and which in many cases have contained more than 0.065 per cent, sulphur. On the other hand, equally convincing evidence is found for the same kinds of steels failing after a short time in similar service, in which the sulphur has been under 0.040 per cent. Evidence of this kind is enough to make one hesitate in forming an opinion whether a reasonable amount of sulphur, say under 0.100 per cent, is detrimental or otherwise. These facts conflict with the generally accepted opinion that steel is of poor quality and should not be used for any important work, unless it be low in sulphur. I sincerely hope the committee will give this angle of their work serious consideration in their future studies.

In discussing the committee's preliminary report, I have copied graphs from their report, combining a number of their graphs on a single sheet and inserting a line for sulphur in order that it may be more easily and quickly comprehended. In this chart, I have shown the composition curves for carbon and manganese at the bottom, adding a line for the sulphur content. Since the ordinates and abscissas are in percentages of sulphur, the line for sulphur becomes a gradually rising straight line.

The effect of the carbon and manganese in the several heats is clearly shown by the approximate parallelism of the composition curves with those representing the tensile, shearing, torsion, impact and hardness curves. All the curves for the physical properties are not shown as there is not sufficient space.

The striking thing seems to be that changes in the carbon and manganese content are immediately reflected by similar changes in the physical properties of the several heats with little, if any, change due to the increasing sulphur. It is almost impossible to make a number of heats of steel containing exactly the same percentage of carbon and manganese. Since this is true, it is practically impossible to determine the effect of sulphur if other variables in composition exist in the steel.

In studying this same problem during 1915, I believed it best to use the same heat of steel, but to vary the sulphur content in the individual ingots of the heat. My results were given in full in a paper before the Society of Automotive Engineers, January, 1916, and later in a paper before the American Boiler Manufacturers in June, 1916. [THE IRON AGE, Jan. 13, 1916.]

Many persons are inclined to believe that sulphur added to steel does not have the same effect as residual sulphur remaining in the steel, but it is surprising how closely my results, obtained by added sulphur, check the results of the committee's work with residual sulphur, when allowances are made for the effects of the variations in the carbon and manganese in the several heats.

The committee's work was confined to rivet steel, but this same quality steel is used in making wire products, tubular products and sheets. The specifications for such products specify the composition and sometimes calls for tensile tests and bending tests. The fitness of the steel is determined by the working of steel during fabrication and by such shop tests as flattening, bending, hydrostatic or beading tests. On pp. 9, 10, 11 and 23 of the report, some shop tests are given, showing very little differences among the steels. These are some of the commercial tests employed by the user to show whether the steel is of good quality, yet the committee, beyond stating what was done, have not made any comment on the quality. Instead physical or mechanical tests of many kinds were made, very few of which are ever regularly used in the arts.

I have examined the complaints or claims for rivet steels covering a period from 1911 to 1922, or 11 years. They show the following percentages:

	Per Cent
For Quality:	
Mixed steel and tensile strength	15
For Surface:	
Mechanical defects, seams, pipe, split heads	28
For Rolling:	
Out of round } Variation of size }	6
For high sulphur	51
Total	100

This table shows that more than one-half of the complaints were due to high sulphur, in most cases causing the rejection of the steel without any effort being made on the part of the user by shop or service tests to see if the steel was really bad or unfit for use.

The committee has refrained from drawing conclusions from its work. The graphs are not easily understood by the layman. Considerable time has elapsed since the work was begun. Probably a much longer time will be needed for the study of the medium and harder varieties of steel. In the meantime, much commercially good steel is being thrown away. The producer and consumer are awaiting the verdict.

I ask the committee to hasten its work, drawing conclusions as it proceeds and completing the work at an early date. This will be of great benefit to our society, settling, partially at least, a controversy of many years' standing.

Dr. Unger exhibited a series of lantern slides taken from a paper contributed by him before the Society of Automotive Engineers in January, 1916, which involved an investigation of sulphur in various forms of rolled products, and the effect of the sulphur on these products when worked. The original paper was published in THE IRON AGE, Jan. 13, 1916.

Heat Treatment of Iron and Steel

The report of committee A-4 on the heat treatment of iron and steel, in the absence of the chairman, H. M. Boylston, was presented by John Howe Hall, Taylor-Wharton Iron & Steel Co., High Bridge, N. J. The report states that one sub-committee was making an investigation to determine the desirability of annealing wrought iron chain at intervals, and that another sub-committee, on the heat treatment of steel castings, has recommended a substitute for the present recommended practice for the annealing of carbon steel castings. The latter was accepted by the Society as tentative and the report as a whole was adopted.

Magnetic Testing of Welds

A highly interesting paper entitled "Electrical and Magnetic Weld Testing as Applied to Butt-Welded Steel Plates" by T. Spooner and I. F. Kinnard, research engineers Westinghouse Electric & Mfg. Co., East Pittsburgh, was presented in abstract by Mr. Spooner. The work described by this paper involves a series of laboratory tests applied to arc-butt welded steel plates to ascertain whether it is possible to develop electrical and magnetic tests capable of revealing the quality of such welds. The paper describes the various apparatus and the methods of applying the electrical and magnetic tests and then these are compared with tension tests from the plates which had been tested electrically and magnetically. It states that the electrical, magnetic and tension tests showed a very fair general agreement among themselves, as well as with the known quality of the welds as reported by the welder. As a result of the tests, the authors feel that the electrical and magnetic methods of testing show considerable promise, at least as applied to butt-welded plates, and that without doubt a really poor weld can be demonstrated. They also feel that the methods described can be applied commercially by suitable alterations in the details of the apparatus so as to provide a more rugged portable device. They hold that such an outcome will greatly increase the possible applications of electrical and gas welding, since it should be feasible to eliminate poor welded sections before any harm could come to a completed structure.

In discussing this report, Dr. Burgess commented on the excellence of the data brought forth and

asked whether the authors believed that the magnetic tests could be adapted to the testing of electrically welded rail joints in position, to which Mr. Spooner replied that, while no work had been done on this subject, they were justified in saying that it could be applied to such rails.

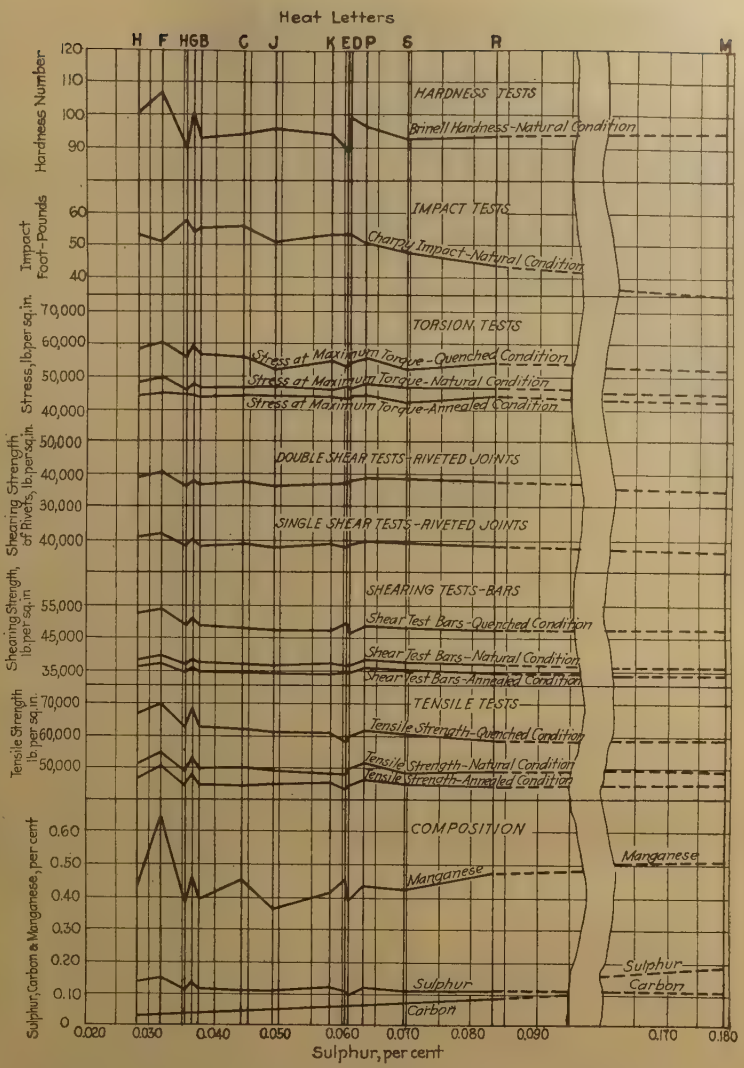
Session on Iron

The session on wrought, cast and malleable iron was held Tuesday afternoon, June 27, with Vice-president Burgess in the chair.

Some problems connected with foundry pig iron were easily the leading topics of this meeting. The subject was introduced by paper entitled "The Physics of Cast Iron and Its Bearing On All Cast Iron Products and Specifications for Cast Iron" by William R. Webster, consulting engineer, Philadelphia, followed by a report of committee A-3 on cast iron, the two subjects being thrown open to general discussion after their presentation.

Physics of Cast Iron

Mr. Webster's paper was presented in abstract by Dr. Moldenke. After referring to some of the earlier discussions of the physics of cast iron before the American Institute of Mining Engineers at one of its meetings in March, 1895, in which the author presented a brief note on a proposed scheme of the study of the physics of cast iron (which led ultimately to the preparation of the testing society's standard specifications for foundry pig iron) Mr. Webster draws attention to the importance of reducing to the lowest possible minimum the great variety of chemical compositions of pig iron now used in the manufacture of steel, gray iron and malleable iron castings.



Various Charts of the Investigation on Sulphur in Rivet Steel Compared with a Chart of the Carbon and Manganese Composition. This was prepared and used by Mr. Unger in his discussion

At present, the chemical requirements of pig iron ordered by foundries making even the same grade and weight of castings vary so greatly that blast furnacemen are caused unnecessary trouble when required to make several grades of pig iron for the same weight and grade of castings. The author emphasized that the standard specifications for foundry pig iron of the society, known as A 43-09, have been in general use for about seventeen years with excellent results, and yet there are no definite statements in the specifications of the chemical composition of the foundry pig iron that would guide and assist the foundryman in making light, medium or heavy castings or malleable iron. According to Mr. Webster, all that they have given the foundrymen is a convenient code for writing out a prescription in code words to the blast furnaceman giving the chemical composition of the irons most desirable for the requirements.

The suggestion is made by the author that the present practice of foundrymen and blast furnacemen be tabulated in such a way that a representative standard set of requirements can be agreed upon which will protect fairly the interests of both producers and consumers and that such requirements would form a valuable addition to the society's present specifications. The author quotes from an article in THE IRON AGE, Dec. 1, 1921, by Y. A. Dyer, entitled "Purchasing Foundry Iron by Specification," in which was cited the classifications by analysis of various foundry irons as created by the committee on steel and steel products of the American Iron and Steel Institute during the war.

In a printed appendix to the paper, Dr. Moldenke, chairman of the committee on cast iron, discusses several proposals in Mr. Webster's paper. He offers some changes in the suggested lines for discussion and investigation as contained in the original proposals and states that the discussion of every point included in such a scheme of study would assume the magnitude of a book. He offered as a summary of a life's work in the production of good castings, which are necessarily interwoven with the chemical and physical characteristics of cast iron, the following:

1. Use the best material suited to the production of the castings wanted.
2. Employ correct melting, molding and finishing processes.
3. Gate the molds correctly, so that the good material properly manipulated, may be given the best chance possible to produce good work.

According to Dr. Moldenke, the natural solution of the present conditions, referred to by Mr. Webster, "is to collect the requirements under which pig iron has

been sold for each grade of casting, including steel and malleable, the work to be done by a committee having an equal representation of blast furnacemen, whom we term the producers, and the consumers who manufacture the finished product. If this course is followed, it would enable any blast furnace in the country to produce a much larger output on a given grade of pig iron than ever before, as the number of grades would be reduced and the hair-splitting requirements removed. In dull times, this would enable the furnaces to stock up considerable quantities of each grade of iron with much more certainty than under the present conditions."

Foundry Pig Iron Specifications

The report of committee A-3 on cast iron was then presented by its chairman, Dr. Moldenke. The section of the report referring to specifications for foundry pig iron, A 43-09, adopted in 1904 and revised in 1909, has been brought up-to-date, says the report, by making a few changes found desirable as experience was acquired. Th principal change referred to consists in removing from the original specifications the code already referred to and incorporating it as an appendix to the new proposed tentative specification. Other points in the committee's reports are referred to later on.

The discussion of Mr. Webster's paper and the proposed changes in the specifications for cast iron involved some sharp differences of opinion, particularly from representatives of makers of steel castings. R. A. Bull, J. L. Uhler and J. H. Hall, in particular, said that they were not aware, until a day or so previous to the meeting, that these specifications were intended to include foundry irons used in steel foundry practice, but understood that they applied only to the gray iron foundry. It was their opinion that in their present form the specifications could not be used to purchase iron for certain steel foundry work, particularly acid open-hearth, and for that reason, they did not approve of the adoption of the specifications, if they were intended to include anything else than gray iron foundry pig iron.

G. C. Davies, Philadelphia, chairman of the committee on pig iron, in response to these objections claimed that the specifications were not only intended to apply to all grades of iron used in all kinds of foundry operations but also felt that they were easily adaptable to the ordering of iron for steel foundry as well as gray iron foundry use. Messrs. Hall and Uhler, replied that for converter use a pig iron having a low manganese content was necessary,and a phosphorus and sulphur content not exceeding 0.04 per cent, while for acid open-hearth work a Bessemer pig iron not exceeding 0.10 per cent phosphorus and a low phosphorus iron not exceeding 0.04 per cent phosphorus and sulphur, as well as a manganese content running from 1 to 1.50 per cent was required. They insisted that it would be impossible to buy such irons under the present foundry iron specifications or, if it were possible, a bonus would be exacted by the producers for certain constituents, such as manganese.

Walter Wood, of R. D. Wood & Co., Philadelphia, impressively stated that he considered that the time for distinguishing various irons by grades had passed and that what was necessary was a set of specifications as elastic as possible. In his opinion the revised specifications as proposed by the committee were the best that could be formulated.

Dr. Moldenke, in reply to some of the foregoing statements, stated that he agreed with some of the objectors and even differed from the chairman of the pig iron committee as to an allowable variation of 0.25 per cent in the silicon content of malleable pig iron, but he felt that the solution of the present difficulty lay in adopting the present report with the understanding that during the coming year the steel foundry and malleable iron interests could formulate their objections or offer specifications more in harmony with their own ideas and present them to the committee for proper consideration and possible further revision next year. With this understanding, the report on foundry specifications, after a division of the vote, was adopted.

Chilled Wheel and High-Test Iron

Two other important matters contained in the report of committee A-3 on cast iron included revisions in the proposed tentative specifications for chilled cast iron wheels, A 46-22 T, and the presentation of new specifications covering what the committee has classified as high-test gray iron castings, which include those irons showing higher strengths than the usual run of iron and more popularly known as semi-steel.

Changes in the tentative specifications for chilled iron wheels were confined chiefly to three points, two of these having to do with chemical composition. In the new tentative specifications, it is stated that the phosphorus content shall not exceed 0.30 per cent and the maximum on sulphur was advanced from 0.17 to 0.18, while under the paragraph dealing with the chilled test, a note is added that the chilled and physical test specified cover only 33-in. wheels of the weights listed, other diameters and weights to be in proportion. It was stated in explanation that the fixing of maximum sulphur at 0.18 per cent was in the way of a compromise as a result of tests made by the Cast Iron Wheel Manufacturers Association. These demonstrated that sulphur is not harmful up to 0.18 per cent or thereabouts, and if limited to 0.17 per cent it would throw out too many good wheels. As to phosphorus, recent physical and thermal tests on a large variety of wheels have shown in some cases that certain wheels crack which are low in phosphorus. J. R. Onderdonk, Baltimore, Md., said that for the size of some wheels now in use, the 250-lb. tup used in the drop tests was altogether too light, some wheels at present in use running as high as 900 lb. and higher.

Wrought Iron

The report of committee A-2 on wrought iron was presented by its chairman, H. C. Smith. It offers minor recommendations for revisions in existing tentative standards for welded wrought iron pipe; for wrought iron forgings for locomotives and cars, and for lap welded and seamless steel and lap welded iron boiler tubes.

In connection with the committee's report, two papers were presented, one by W. M. Myers, general manager Highland Iron & Steel Co., entitled "Merchant Bar Iron Made by the Busheled Scrap Process" and the other by H. S. Rawdon and S. Epstein of the Bureau of Standards, entitled "Some Observations on the Nick-Brand Test for Wrought Iron."

Mr. Myers described the manufacture of merchant bar iron made from re-worked iron scrap or a reworked mixture of iron and steel scrap in hand busheling furnaces and in mechanical busheling furnaces. Test results were included, together with the physical properties and chemical analysis of the materials. The Rawdon and Epstein paper called attention to the fact that the nick and bend test, as included in specifications for wrought iron, specifies that the materials shall show no crystalline areas or not more than a specified amount, the test being made either by pressure or by blows. The aim of the paper is to show that the usual nick and bend clause is indefinite, since either fibrous or crystalline fractures may be produced according to the procedure followed, including the apparatus used and the way in which the blow is received and the nick is made. Robert Job, Montreal, Canada, pointed to this paper as a good illustration of much of the work done by the Bureau of Standards and contended that decidedly more explicit specifications were needed for wrought iron, particularly as to the crystalline areas resulting from the nick and bend tests.

Symposium on Impact Testing

The entire Wednesday evening session, June 28, was devoted to a symposium on impact testing of materials. It is probably the first symposium of the kind ever attempted; it made a deep impression and was a complete success. In general, it was a review of the development of the impact testing of materials and a discussion of the significance and value of the impact test. There were ten contributions to this symposium. After

a brief preface, the subject was introduced by a résumé of impact testing of materials, including a bibliography and then various papers discussed three phases of the subject: Machines and test specimens used; standardizations of machines and specimens for notched bar impact tests of metals; and the measurement of impact, closing with a paper on the significance of the test.

The contributions to the symposium were published in a pamphlet, ready for distribution at the meeting and containing 107 pages. The symposium was announced as the outcome of an informal discussion in the society's committee E-1 on methods of testing, extending over a period of nearly two years. It was agreed by the committee that steps should be taken by the society to study impact testing of materials more definitely and intensely than heretofore attempted in any concerted way in this country, covering not only details of methods and their standardization, but also inquiring into the significance of such tests. As a result, committee E-1 appointed a sub-committee of 12 members of which T. D. Lynch, Westinghouse Electric & Mfg. Co., was chairman which, in co-operation with the committee on papers, planned the symposium. The publication of the various papers referred to is believed by the committee to comprise the most recent and extensive statement of the status of impact testing of materials and to serve as the start for further study.

Machines for Impact Testing

The résumé and bibliography was prepared by H. L. Whittemore, mechanical engineer Bureau of Standards, Washington. The contributions on machines and test specimens used in impact testing were by D. J. MacAdam, Jr., metallurgist United States Naval Engineering Experiment Station, Annapolis, Md., on "Impact Tests of Metals"; by Thomas R. C. Wilson, engineer in forest products, Forest Products Laboratory, United States Department of Agriculture, Madison, Wis., on "Impact Tests of Wood," and by Earl B. Smith, senior testing engineer, United States Bureau of Public Roads, Washington, entitled "Impact Tests of Road Materials."

Mr. MacAdam, besides describing impact testing machines of various types, as well as a static-resilience testing machine, discussed the relations of repeated impact to single blow impact and the various impact specimens in common use on metals. He also entered into a theoretical discussion of stress distribution in a notched tension specimen and its effect on resilience, as well as other important phases of the subject.

Under the second general division of the symposium, namely, standardization of machines and specimens for notched bar impact tests of metals, one of the most interesting contributions to this symposium was that of C. L. Warwick, secretary-treasurer of the society, Philadelphia, entitled "A Résumé of American Practice in Notched Bar Impact Tests of Metals." The paper is the result of the circulation of a questionnaire among a selected list of testing engineers, laboratories, etc. Mr. Warwick believes the results of the questionnaire point to the desirability of the society's undertaking a suitable study of impact testing in order that methods for such testing shall be prepared, which will compare with the society's methods for tension, compression and other tests of materials.

The brief review of the work on impact testing done by the British Engineering Standards Association was then presented in abstract by Mr. Lynch. It covered the chief features of British practice in the impact testing of notched metal specimens, abstracted from a more complete report of the main committee a year ago by a special committee under the chairmanship of the author. Mr. Lynch summed up with the statement that it is evident that there is a real need for a standardization of the main features of impact testing by the American society, including size and type of specimen, depth of notch and its character, the striking speed and energy and other important details.

Measurement and Significance of Impact

Under the general subject of measurement of impact, three papers were presented, one by C. E. Margerum, metallurgist, United States Naval Ordnance Plant, Charleston, W. Va., who discussed measurement of pressures caused by impact, another by Armin Elmendorf, consulting engineer, Haskelite Mfg. Corporation, Chicago, on "Measuring Forces of Impact," and another by Prof. H. F. Moore on the "Measurement of the Force of Impact by Means of the Elastic Stretch of a Steel Bar."

The symposium was brought to a close by a paper entitled "Significance of the Impact Test" by F. C. Langenberg and N. Richardson, metallurgist and research engineer, respectively, Watertown Arsenal, Watertown, Mass. A brief summary follows:

The authors point out that many attempts have been made to correlate the impact test with other tests and state that it does not appear at the present time that a definite relation between the static tension test and the dynamic impact test exists. Reference is made to attempts of investigators to develop a certain relation between the amount of work done on a given material when broken statically and dynamically. The conclusions are diversified, but the authors believe that the proper conclusion in the light of our present knowledge is that this relationship will vary with the nature of the material.

Regardless of the type of impact machine employed or form of specimen used, the essential result obtained is the amount of energy absorbed by the specimen. In comparing static and dynamic tests, therefore, the same essential data should be recorded in both cases, and the authors point out that in the ordinary static tension tests as it is carried out to-day such data are not recorded and it is therefore impossible to draw any definite relationship between the values usually recorded in the tension test and the data obtained from the impact test. From the large number of tests made at the laboratories at Watertown Arsenal, the authors conclude that the elastic limit and tensile strength of a wide variety of steels, both in the annealed and heat-treated conditions, do not bear any relationship whatever to the work expended in the rupture of Charpy impact test specimens. The percentgae of elongation in tension is low when the Charpy value is low, but it does not follow that when the percentage of elongation is high the Charpy value will be correspondingly high. Typical test data on certain alloy steels and ordnance steels are recorded, illustrating these conclusions and furnishing an opportunity for comparison of static and dynamic tests.

The paper concludes with a brief discussion of the properties revealed by the impact test and the possibilities of interpreting results of the test in engineering practice.

Fatigue of Metals

The major portion of the morning session of Thursday, June 29, was devoted to the subject of the "Fatigue of Metals" with past-president G. H. Clamer presiding. The subject was introduced by a paper entitled "Fatigue or Progressive Failure of Metals Under Repeated Stress" by Profs. H. F. Moore, J. B. Kommers, and T. M. Jasper, University of Illinois, Urbana, Ill. Professor Moore delivered an abstract of the paper, which consists largely of a discussion of the testing practice used in making repeated stress tests, with special reference to the testing machines, the specimens and the methods used in the joint investigation of the fatigue of metals, now in progress under the auspices of the National Research Council, the Engineering Foundation, the General Electric Co., and the Engineering Experiment Station of the University of Illinois.

The authors point out several important conclusions which have been arrived at. One of these is that, for a ferrous metal, there exists a fairly well defined limiting unit stress below which the metal can withstand hundreds of millions of reversals of stress, and that, so far as can be seen, such a metal can withstand an indefinitely larger number of such reversals. For this particular characteristic or limiting stress the term "endurance limit" has been given, and the statement is made that experimental evidence in favor of its existence has been uncovered.

Another feature of this paper is a discussion of the significance of this endurance limit and the presentation of charts showing its correlation with other physical properties. The paper also discusses recent test results of repeated-stress tests. The paper concludes with the following significant statement:

An interesting series of tests is now in progress. Specimens which have withstood 100,000,000 reversals of a stress close to the endurance limit have been subjected to further reversals at slightly higher stresses—in one case 16 per cent higher—and they have withstood without failure a second

run of 100,000,000 reversals of this increased stress. Static tension tests on other specimens which have withstood 100,000,000 reversals of stress close to the endurance limit have given distinctly higher values for tensile strength than those given by tension tests of the material before repeated stressing. These tests are by no means complete, but the possibility that steel may be actually benefited by repeated stressing below the endurance limit is of interest.

Among the numerous lines of possible investigation of the phenomena of repeated stress, two seem to the writers to be worthy of special attention: (1) the extension of investigations of the fatigue strength of non-ferrous metals, with an attempt to see whether they show any phenomena markedly different from those shown by ferrous metals; and (2) an investigation of the strength of steel under repeated stress and at high temperature. There is almost a complete dearth of test data on this second item, and the problem is certainly one of great importance to makers and users of steam turbines and internal combustion engines.

Stress Concentrations and Polarized Light

At the conclusion of the presentation of this paper, A. L. Kimball of the research laboratory of the General Electric Co., Schenectady, N. Y., delivered a brief illustrated address on "Stress Concentrations as Determined by the Use of Transparent Specimens and Polarized Light." Colored slides illustrating the phenomena were shown and were very impressive.

There was also on exhibition three testing machines used by the joint investigation of the fatigue of metals referred to by Professor Moore and brought from Urbana, especially for the purpose. There was a reversed bending machine of the Farmer type; a machine for testing under a combination of reversed-bending and steady tension, and a reversed bending machine adapted either for tests to destruction or for the "rise-of-temperature" test. The latter machine was shown in operation.

A fairly liberal discussion followed the presentation of Professor Moore's paper, several being written. L. E. Tuckerman, Bureau of Standards, Washington, presented an interesting comparison of the work done at Urbana and at Annapolis, laying particular stress upon the specimens of ingot iron used at both places, as being easily comparable, pointing out that the fatigue results obtained at Annapolis are lower than those obtained at Urbana; he raised the question whether the explanation might not be a difference in the surface condition of the specimen used, particularly as affected by rough or smooth tool cuts.

An interesting comparison of certain fatigue tests made on the non-ferrous alloys, duraluminum and a magnesium alloy, as conducted by the Aluminum Co. of America, was presented by R. L. Templin, New Kensington, Pa. The question of the making of fatigue tests of cast iron was suggested as necessary by George K. Elliott, Lunkenheimer Co., Cincinnati, because of the fact that his experience had shown that drop tests, made on two cast irons of practically the same chemical and physical properties, had shown as high as 200 per cent difference in resistance to breaking. C. B. Bronson, New York Central Lines, New York, called attention to some investigations being made by that railroad on the fatigue of steel rails and some other products used in railroad work, with special reference to determining their endurance limit and their improvement, such information being essential for rail steel used in any form of high-speed service on railroad. The discussion was brought to a conclusion by Prof. T. M. Jasper of the University of Illinois, who answered certain questions.

Non-Ferrous Metals and Corrosion

The first session of the convention, Tuesday morning, June 27, was devoted to papers and committee reports on non-ferrous metals and corrosion. It embraced reports of Committee B-1 on copper wire, J. A. Capp, chairman; of Committee B-2 on non-ferrous metals and alloys, Prof. William Campbell, chairman. These reports presented new tentative specifications for brass pipe, copper tubing and admiralty condenser tubes and tentative methods of chemical analysis of brass ingots and sand castings and of bronze bearing metals. They also included tentative revisions in specifications for pig lead and for aluminum for remelting and rolling.

An important paper, "Physical Properties of Some Copper-Silicon-Aluminum Alloys When Sand Cast," by E. H. Dix, Jr., and A. J. Lyon, engineering division, air service, Dayton, Ohio, was presented in abstract. The paper gives the results of an investigation covering alloys of 3, 6 and 9 per cent silicon with 0, 2, 4 and 6 per cent, and with 2 per cent copper and 1 per cent manganese. The metallography of the alloys "as cast" is illustrated in detail and all the results are given in the form of graphs which show that the most desirable compositions lie between 3 to 5 per cent for both copper and silicon. Within these limits alloys can be prepared, the authors say, by simple foundry methods, to show physical properties as good or better than No. 12 alloy and having casting qualities superior to any other aluminum alloy of which the writers have knowledge. "They possess the property of being cast without chills and around steel barrels or hard cores without cracking."

Corrosion

The report of Committee A-5 on corrosion of iron and steel, J. H. Gibboney, acting chariman, consisted of reports of sub-committee II on preservative metallic coatings for metals, of sub-committee III on the inspection of the Fort Sheridan, Pittsburgh and Annapolis tests and sub-committee V on total immersion tests. The report mentions the death during the year of its chairman, Mr. Vorhees, who passed away last September and pays a suitable tribute to his leadership of the committee for seven years.

W. D. Bancroft, professor of chemistry Cornell University, Ithaca, N. Y., in a paper "Preliminary Notes on Corrosion," which is a brief résumé of the corrosion problem, states that he believes measurement of electromotive force is practically valueless from a fundamental viewpoint.

"A Method of Determining the Spelter Coating of Iron and Steel Sheets by Measuring the Rise in Temperature of the Acid Employed," by D. M. Strickland, research engineer, American Rolling Mill Co., describes an accurate method for determining the weight of such coating which is a departure from any method heretofore suggested. A measured volume of hydrochloric acid is poured into a glass tumbler. The temperature of the acid is taken with a thermometer, reading to 0.1 deg. C. The test piece or pieces are dropped into the acid, the galvanized coating is dissolved from the specimens, and the temperature rise recorded. Each one-tenth degree temperature rise equals a definite weight of zinc in grams. Radiation has no influence as the action is completed in possibly 30 sec. All sizes and shapes of galvanized specimens may be used. The equipment is portable and can be used for field tests, the glass container and thermometer taking the place of the laboratory balance heretofore used in making galvanized coating determinations. A table showing results obtained and detailed description of apparatus, application and manipulation are included.

At the conclusion of this session an announcement was made of the election of officers for the next year. This was published in THE IRON AGE, June 29.

Miscellaneous Matters

Steps were put on foot to combine the two committees on coal and coke, Committee D-5 and D-6, the chairmen of which are A. C. Fieldner and Dr. Richard Moldenke, respectively. One session was devoted Thursday afternoon, June 29, to coal, coke, timber, etc., at which revisions in the regular and tentative specifications were discussed. The committee on coal reported that an exhaustive study has shown that it is impracticable to adopt standard specifications for steam coal because of the great variety of coals. The coke committees presented a tentative method for the shatter test for coke, the result of a year's study.

The evening session of Tuesday, June 27, was devoted to the annual address of the president, C. D. Young, and the annual report of the executive committee, reported in brief in THE IRON AGE, June 29. This was followed by an informal dance and smoker.

CONFUSED CONDITIONS

Much Uncertainty Concerning Coal Strike—Little Gain in Loadings

PITTSBURGH, July 3.—Between the efforts of the Government to bring about a conference of the coal mine operators and the officials of the miners' unions, the walkout of the railroad car shop employees and the observance of the Fourth of July holiday, the fuel situation is very much confused. This is not surprising in view of the fact that there are reports that meetings of miners' locals are being held to consider, among other things, an immediate return to work, pending a settlement of the wage scales. This would indicate some progress toward a settlement, but is counterbalanced by suggestions that the Pittsburgh Coal Co. and some of the other operators with mines in the unionized districts in and around Pittsburgh, tiring of the passive policy hitherto pursued, on July 5 would start up several operations on an open shop basis.

Since a week ago there has been no appreciable gain in the loadings of coal in western Pennsylvania; indeed, as indicating the unrest which still exists in this district, several mines which had resumed have gone down again. The walkout of the railroad shop employees is associated with the coal strike in that it appears to have strengthened the will of the miners to stay out, and, of course, the Fourth of July observance has been the occasion of a good many staying away from work until after that holiday.

The supply situation is tighter than it has been recently and probably will remain so at least over the present week. Local non-union coal now is quoted at $4 minimum, and the few small lots of lump gas coal coming out of local mines command $5 per net ton at mines. Southern coal is priced at $3.50 to $3.75, beehive oven coke is extremely scarce this week and quotable anywhere from $8 to $10 per net ton at oven.

Keen Interest in Washington Conference

UNIONTOWN, PA., July 1.—Considerable interest in the Connellsville bituminous region now is centering on the outcome of the negotiations between union representatives and coal operators called to Washington by President Harding. Just how a successful outcome of such negotiations would affect the local region is being studied. The Connellsville region has never been unionized. The operators have never had any dealings with the unions. Since the sympathetic strike developed in the region union locals were organized at many plants, but these have had no relations with the operators. It is almost a certainty that the union will not be recognized in the Connellsville region. Should the strike be settled and the union men return to work, what will happen to the men who have joined the union in this region? What support will the union give them or will they be allowed "to hold the bag"? These questions are being asked with no answers given.

Union organizers have been busy this week. From one to four meetings a day have been held all week, at which the organizers are understood to have devoted much of their attention to discussing the probable results of the Washington conference and predicting a successful outcome of the strike—but not stating in what way it will be successful.

The sheriff, following disorders of a minor character, issued a ban on meetings within a mile of operating mines. One meeting in the county this week was entirely broken up when the strikers showed some signs of surliness when told to move on. Several other meetings were held after they had been moved outside the limits prescribed.

Beating up of a working miner in Brownsville, not the first such occurrence, resulted in the sheriff and State police taking over police powers in the three river towns.

The union got a foothold at Leisenring No. 2 of the H. C. Frick Coke Co. this week, causing a drop in production at that plant, although failing to bring about an entire suspension of operations.

Hundreds of men have come into the Connellsville region during the past fortnight, bringing production up noticeably. Scores of miners have moved from one plant to another where they have gone to work. To date it is estimated that there have been some 500 eviction notices, possibly 600, served on strikers in the region. In most of these instances their houses are now occupied by men who have come into the region. Many of the evicted families are now living in tents, and in some sections small tent colonies have appeared.

The H. C. Frick Coke Co. production showed an increase of some 1000 tons a day over the preceding week Production this week, it is estimated, will show an increase of 600 to 700 tons a day over last week.

Mineral Section Added to Iron and Steel Division

Inquiries regarding minerals are coming to the Iron and Steel Division of the Bureau of Foreign and Domestic Commerce in such increased volume that its scope has been enlarged by having a mineral section added to it and placed in charge of James A. Stader, of Joplin, Mo., an experienced man in mineralogy. Being a part of the Iron and Steel Division, the section will be under the supervision of Luther Becker, chief of the division. Mr. Stader took up his duties on July 1.

J. A. STADER

The Mineral Section will handle all minerals, metallic and non-metallic, excepting fuels, iron ore and such ores and ferro-alloys as are intimately associated with iron and steel. The section will pay particular attention to refractories and the major metals with which it will deal will include copper and alloys of bronze and brass and their products; lead, zinc and tin and their manufactures. The refractories materials will involve such products as fire clay, magnesite, chrome, and silica brick and clay products except earthenware and pottery. Other products include abrasive, cement, sand, tiling for construction purposes and gold and silver, excepting their financial aspects.

Mr. Stader was selected to take charge of the section because it was considered advisable to find a man not only possessed of a thorough knowledge of the work, but also because of his actual foreign experience in mining and investigation and his acquaintance with economic conditions abroad as they apply to minerals and their production. Mr. Stader is a graduate chemical engineer of the class of 1906 of the University of Missouri. In that year, he did mining work in Mexico. Later he became chief engineer of the Eagle Pitcher Lead Co., Joplin, and subsequently was made a member of the Central European Industrial and Mining Commission, under the Supreme Council created by the armistice agreement. As a member of the commission, Mr. Stader was stationed first in Moravia and upper Silesia. He traveled extensively in connection with his work through various mineral producing European countries.

Production of the Ford Motor Co. for May is reported by *Automotive Industries* at 144,469, which included 134,222 Ford cars and trucks, 602 Lincoln cars and 9105 tractors. Of the Ford cars and trucks, 6579 were Canadian and 7170 for export. Tractors for ex-

An involuntary suit in bankruptcy has been filed against the Cedar Rapids Foundry & Machine Co., Cedar Rapids, Iowa.

Reduced Railroad Rates Effective July 1.

The railroads have not yet issued tariff supplements containing new freight rates in effect July 1, except in a few scattering instances. The following rates are substantially correct. In some instances, the announced rates will be different to the extent of a cent or two, according to the construction placed upon the rule as to figuring new rates. For example, the rate on pig iron from the valleys to Pittsburgh figures $1.764. When finally issued, this may be $1.76 or $1.77.

Finished Material

(Per 100 Lb., Carload Lots)

Pittsburgh to

Philadelphia	$0.325
Baltimore	0.315
New York	0.34
Boston	0.365
Buffalo	0.265
Cleveland	0.215
Cleveland, Youngstown, combination rate	0.19
Detroit	0.295
Cincinnati	0.295
Indianapolis	0.31
Chicago	0.34
St. Louis	0.43
Kansas City (pipe)	0.705

Pittsburgh to

Kansas City	$0.735
St. Paul	0.595
Omaha	0.735
Omaha (pipe)	0.705
Denver	1.275
Denver (pipe)	1.215
Pacific Coast	1.50
Pacific Coast, ship plates	1.20
Birmingham	0.69
Memphis	0.385
Jacksonville, all rail	0.50
Jacksonville, rail and water	0.415
New Orleans	0.515

Pig Iron

(Per Gross Ton)

Buffalo to

Boston (all New England)	$4.92
New York	4.92
Philadelphia	4.92
Pittsburgh	3.275
Albany	2.27
Syracuse	1.89
Rochester	1.385

Youngstown to

Pittsburgh	1.77
Cleveland	1.77
Canton, Ohio	1.77
Warren, Ohio	0.76
Chicago	4.79
Indianapolis	3.66
St. Louis	5.80
Cincinnati	3.66
Boston	6.43
New York	6.03
Baltimore	5.43
Philadelphia	5.63

Virginia to

Philadelphia	5.17
Brooklyn and Jersey City	5.28
Boston	5.64

Birmingham, Ala., to

Cincinnati	4.05
Louisville	3 72
Columbus, Ohio	5.40
Indianapolis	5.29
Chicago	6.00
Cleveland	6.00
Boston, rail and water	6.91
Boston, all rail	9.61
Philadelphia, rail and water	6.67
Philadelphia, all rail	7.81
Pacific Coast	22.40
Omaha	8.17
St. Louis	5.17
Chattanooga	1.02

Ironton and Jackson to

Cincinnati	2.27
Cleveland	3.02
Detroit	3.28
Chicago	4.79

From Chicago to

Rockford, Ill.	1.385
Freeport, Ill.	1.385
Rock Island, Ill.	1.745
Moline, Ill.	1.745
Davenport, Iowa	1.745
Kewanee, Ill.	1.745
Peoria, Ill.	1.745
Aurora, Ill.	0.88
Elgin, Ill.	0.88
Joliet, Ill.	0.63
Milwaukee, Wis.	0.755
Racine, Wis.	0.755
Kenosha, Wis.	0.755
Waukesha, Wis.	0.755
Janesville, Wis.	1.385
Beloit, Wis.	1.385
Madison, Wis.	1.64
Sheboygan, Wis.	1.945
Minneapolis, Minn.	3.04
St. Paul, Minn.	3.04
Michigan City, Ind.	1.385
South Bend, Ind.	1.89
Kokomo, Ind.	2.645
Benton Harbor, Mich.	2.61
Muskegon, Mich.	3.025
Grand Rapids, Mich.	3.025
Kalamazoo, Mich.	2.645
Jackson, Mich.	3.025
Lansing, Mich.	3.15
St. Louis, Mo.	2.16
Des Moines, Iowa	4.15
Omaha, Neb.	5.47
Batavia, Ill.	0.88
Chicago Heights, Ill.	0.63
Geneva, Ill.	$0.88
Carpentersville, Ill.	1.01
Danville, Ill.	1.64
Belvedere, Ill.	1.385
Sterling, Ill.	1.385
Galesburg, Ill.	1.745
Quincy, Ill.	1.745
La Porte, Ind.	1.745
Terre Haute, Ind.	2.645
Indianapolis, Ind.	2.645
Mishawauka, Ind.	1.89
Battle Creek, Mich.	3.025
Appleton, Wis.	1.945
Fond du Lac, Wis.	1.945
Green Bay, Wis.	1.945
La Crosse, Wis.	2.31
Winona, Minn.	2.31
Duluth, Minn.	3.76
Dubuque, Iowa	1.745
Cedar Rapids, Iowa	3.04
Charles City, Iowa	3.04
Waterloo, Iowa	3.04
Ottumwa, Iowa	3.645
Marshalltown, Iowa	4.01

To Chicago from

Birmingham, Ala.	6.00
Ironton, Ohio	4.79
Jackson, Ohio	4.79
Mahoning Valley	4.79
Shenango Valley	4.79
Granite City, Ill.	2.16
Sault Ste. Marie, Ont.	3.645
Wells and Marquette, Mich.	3.04
Cadillac and Antrim, Mich.	3.15
Boyne City and East Jordan, Mich.	3.275

To New York from

East. Pennsylvania	2.27
Buffalo	4.92
Virginia	5.54

To common New England points

From Eastern Pennsylvania	3.65
From Buffalo	4.92
From Alabama	9.60

From Cleveland to

Akron	1.64
Barberton	1.64
Bucyrus	2.02
Canton	1.77
Columbus	2.27
Dover	1.77
Dayton	2.52
Erie	1.77
Elyria	1.77
Lima	2.39
Mansfield	2.27
Newark	2.27
Painesville	1.77
Ravenna	1.64
Salem	1.77
Springfield	2.39
Valley points	1.77

From Toledo to

Bucyrus	1.77
Columbus	2.27
Mansfield	2.27
Springfield	2.40
Dayton	2.40
Indianapolis, Ind.	2.90
Ft. Wayne, Ind.	2.27
Marion, Ind.	2.65
South Bend, Ind.	2.90
Detroit	1.39
Jackson, Mich.	1.77
Lansing, Mich.	2.02
Saginaw, Mich.	2.52
Bay City, Mich.	2.52
Pontiac, Mich.	1.64

From Eastern Furnaces to Philadelphia:

Virginia (all furnaces)	$5.17
Swedeland	0.76
Pottstown	1.14
Birdsboro	1.14
Coatesville	1.14
Reading	1.14
Bethlehem	1.26
Sparrows Point, Md.	1.64
Catasauqua	1.39
Parryville	1.39
Hokendaqua	1.39
Hellertown	1.39
Alburtis	1.39
Robesonia	1.39
Emporium	3.54
Wharton, N. J.	1.64

New Steel Rails

(Per Gross Ton)

Pittsburgh to

New York	$5.17
Philadelphia	4.92
Baltimore	4.79

Pittsburgh to

Boston	$5.67
Chicago	5.42
St. Louis	6.18

Billets, Wire Rods, Etc.

(Per Gross Ton)

Pittsburgh to

New York	$5.67
Philadelphia	5.17
Baltimore	4.92

Pittsburgh to

Boston	$6.18
Chicago	5.42
St. Louis	6.81

Coal Freight Rates

To Eastern Points, per Gross Ton	Originating District: Connellsville Westmoreland Pittsburgh	Fairmont	Greensburg	Latrobe
Baltimore	$3.22	$3.09	$2.95	$2.86
Chester, Pa. (PRR)	2.22	3.09	2.95	2.86
Chester, Pa. (P&R)	3.35	3.21	3.08	2.99
Harrisburg, (PRR & P&R)	2.72	2.58	2.45	2.36
Johnstown, Pa. (B&O)	1.39	1.39		
*Johnstown, Pa. (PRR)	1.64	1.64		
Lebanon, Pa. (PRR & P&R)	3.10	2.96	2.83	2.74
New York (37th St.)	3.47	3.34	3.20	3.11
Brooklyn	3.60	3.47	3.33	3.24
Philadelphia	3.22	3.09	2.95	2.86
Sparrows Point	3.22	3.09	2.95	2.86
Steelton, Pa.	2.72	2.58	2.45	2.36
South Bethlehem, Pa.	3.35	3.21	3.08	2.99
Syracuse, N. Y.	3.35	3.21	3.08	2.99

*The rate from points on the Monongahela Railway in the Fairmont group south of the Pennsylvania state line to Johnstown is $1.96 per net ton. Rates to Johnstown from Greensburg and Latrobe groups apply specifically from point of origin to destination.

The Connellsville rate applies to shipments from points

on the Southwest Branch of the Pennsylvania Railroad south of Ruffsdale, from points on the Pittsburgh, Virginia & Charleston and points on the Monongahela River railroad.

The Fairmont rate on shipments via the Baltimore & Ohio applies to shipments from points East of Suterville, Pa., from points on the Smithfield & Masontown Branch and from the Fairmont Region of West Virginia.

To Western Points, per Net Ton	Originating District — Pittsburgh Group	Upper Connellsville	Lower Connellsville
Canton, Ohio	$1.60	$1.65	$1.80
Chicago	3.09	3.09	3.09
Cleveland	1.85	1.90	1.98
Columbus, Ohio	1.89	2.02	2.04
Detroit, Mich.	2.58	2.58	2.58
Indiana Harbor, Mich.	3.09	3.09	3.09
Toledo, Ohio	2.39	2.39	2.39
Youngstown, Ohio	1.35	1.42	1.64
Lake Ports	1.67	1.73	1.81
To Canadian Basing Points:			
Port Maitland, Ont.	2.26	2.39	2.39
Buffalo	2.25	2.39	2.39

These rates apply in a general way to shipments from the territory described. There are, however, numerous extensions to the specific rates quoted and in each case before applying the rate as a basis for freight charges, the shipper or consignee should determine the exact location of the mine from which the business will move; then refer to the tariff naming the rate in question.

The Pittsburgh district includes points East as far as Latrobe and South on the Southwest Branch to and including Ruffsdale; South to, but not including, Brownsville on the Pittsburgh, Virginia & Charleston railroad; eastward to Dawson on the Baltimore & Ohio railroad and eastward to Dickerson Run and Southwest to and including Brownsville on the New York Central lines.

The Connellsville district includes points on the Southwest Branch of the Pennsylvania railroad South of Ruffsdale; on the Pittsburgh, Virginia & Charleston, except Braznell and all Monongahela River railroad points; New York Central points East of Dickerson Run, including Connellsville Transfer and points on the Baltimore & Ohio, Dawson to Point Marion, Pa.

Coke

(Per Net Ton)

Connellsville, Pa., to		*Connellsville, Pa., to*	
Baltimore	$3.21	Pittsburgh	$1.51
Buffalo	3.28	Port Henry, N. Y.	4.54
Canton, Ohio	2.52	Port Maitland, Ont.	3.28
Chicago	4.16	Pottstown, Pa.	3.40
Cleveland	2.77	Reading, Pa.	3.28
Columbus, Ohio	2.77	Richmond, Va. (B. & O.)	4.70
Detroit	4.65	Richmond, Va. (P. R. R.)	4.79
East St. Louis	4.54	South Bethlehem, Pa.	3.53
Erie, Pa.	2.77	Swedeland, Pa.	3.53
Harrisburg	2.90	Toledo	3.28
Joliet, Ill.	4.16	Wheeling	2.27
Louisville	4.16	Valley points	2.27
Milwaukee	4.79		
New York	3.91		
Philadelphia	3.53		

Iron Ore

(Per Gross Ton)
(From lower lake ports)

Direct Ore

Rail of vessel to car	
Handling charge	$0.08
Line haul to	
Mahoning and Shenango valleys	0.82
Dover, Ohio, district	0.88
Midland, Pa., district	0.99
Pittsburgh district	1.15
Jackson, Ohio, district (Toledo)	0.90
Jackson, Ohio, district (Cleveland)	1.12
Ironton and Hamilton, Ohio, districts	1.25
Johnstown, Pa., district	1.30
Lehigh valley district	1.94
Sparrows Point, Md.	1.99

Dock Ore

In addition to line haul	
Rail of vessel to dock pile	0.56
Dock pile to car	0.13
Storage charge per ton per month	0.01

Mines to Upper Ports

The new freight rates on Lake Superior ore from the mines to the upper lake ports which became effective June 19 representing practically a 10 per cent reduction are as follows, the rates named including unloading charges:

Marquette from Eastern Marquette range	$0.69
Marquette from Western Marquette range	.88
Escanaba from Menominee and Marquette ranges	.91
Ashland from Gogebic range	.91
Duluth and Superior from Mesabi Range	.91
Two Harbors from Vermillion range	.91
Duluth and Superior from Cuyuna range	.91

SOUTHERN COMPLAINTS

Hearing of Pittsburgh Basing Case Held at Chattanooga

CHATTANOOGA, TENN., July 3.—Several Birmingham steel fabricators appeared before Federal Trade Commission Examiner J. W. Bennett in Chattanooga last week presenting argument against the Pittsburgh plus plan of basing steel prices. Interesting testimony was that of R. I Ingalls, of the Ingalls Iron Works, structural steel operator. Mr. Ingalls said the territory of his company included the states of North and South Carolina, Georgia, Florida, Louisiana, Mississippi, Alabama, Tennessee and Virginia, and included exports to Cuba, South America, Philippines and other points. He said as a general rule a differential of $5 a ton is being added by the Tennessee company to the Pittsburgh price, but this is not always the case. In highly competitive jobs, where the Tennessee company desires the business, lower prices are made. He said his business would be much curtailed if full Pittsburgh base plus freight were charged. If there were no differential, Mr. Ingalls said his trade territory would be widened. Concessions have enabled him to go into Virginia and North Carolina. He purchases 80 to 90 per cent of the 20,000 to 25,000 tons of steel consumed in his plant per annum in Birmingham. The Fairfield plant of the Tennessee company, which was built in 1919, has materially assisted in the expansion of his business.

Frank J. Ridout, of the Perfection Spring & Mattress Co., Birmingham, said he paid Pittsburgh price plus the freight from mill to Birmingham for steel for bed springs purchased of a maker other than the Tennessee company. He claimed that on account of this disadvantage bed spring makers in Wisconsin, St. Louis and other distant points competed with him in local territory. He said if the full Pittsburgh price plus freight from Pittsburgh were charged, it would put him out of business.

Harold M. Thompson, of Johnson & Thompson, Birmingham, structural steel operators, specializing in manufacture of tanks, said the operation of his plant was much restricted by the differential. He said the American Bridge Co. could get in wherever it wished irrespective of destination. He declared his company could not compete with Northern operators to the same degree that they compete with him in Birmingham district and adjacent territory.

Francis M. Herring, of the Scofield Sons Co., Macon, Ga., maker of boilers and tanks, said a real Birmingham production cost selling price would extend the competitive area of all Southern manufacturers by allowing them to sell in what naturally, by geographical and fundamental transportation factors, would seem to be their logical right. This would result in less keen competition in what is now the restricted area of Southern factories, as all would share in the benefits of increased volume of business through larger area of sales. This, in turn, would result in lower overhead expenses, which would be reflected in lower selling prices to the ultimate benefit of the consumer.

J. F. Baker, of Sanford-Day Iron Works, Knoxville, said he is limited to Kentucky, Tennessee and Virginia in sales of complete mine cars. On car trucks alone, bodies to be supplied by some other manufacturer, he can compete even in the Pittsburgh district, because he gets his pig iron in Birmingham at Birmingham production price. He sells the trucks pretty well over the country by reason of getting the iron so advantageously.

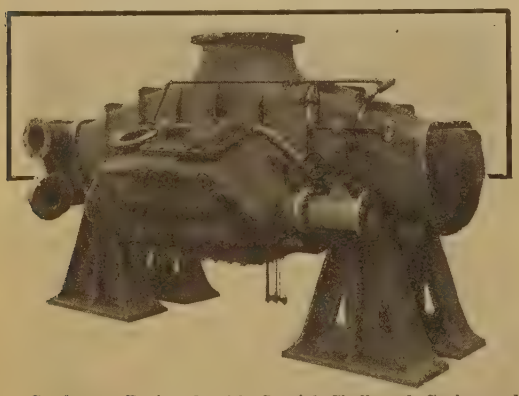
Testimony as to disadvantages of the Pittsburgh plus selling price base were also given by officials of the Vulcan Rivet Works, Birmingham, and others.

Surface Condenser with Separate Cooler

In the accompanying illustration is a shop view of one of the smaller of the new type of surface condenser units developed by the Ingersoll-Rand Co., New York, and built to serve a 600-kw. turbine.

An interesting feature is the separate cooler mounted on the shell, as shown. This is intended to devaporize thoroughly the air and vapors before they are finally drawn off by the vacuum equipment. Air is withdrawn by a steam jet vacuum pump in combination with a small secondary reciprocating pump. The primary steam jet is mounted on the cooler dome and the secondary jet on the tee, shown. The secondary vacuum pump takes its suction from the open end of the tee. The condensate and circulating water pumps are Cameron centrifugal motor-driven units.

The new type condenser is characterized by the special shell and cooler design combined with an



Condenser Designed with Special Shell and Cooler and with Tubes in Stages, to Eliminate Waste Tubes and Reduce Surfaces

arrangement of tubes in "stages" which is said to result in the practical elimination of waste tubes and a condenser of greatly reduced surface. The surface may be still further reduced by the use of high water velocities, which it is urged, are of benefit in alleviating corrosion and fouling.

Elimination of waste tubes is secured by arranging the tubes in "stages," by correct shell shape, and by the use of a separate devaporizer-cooler. The tubes, spaced on wide centers in the top of the shell, are brought closer together in each lower bank or stage. The shell itself is gradually narrowed from its width at the top to that of a nozzle running the length of the shell under the last row of tubes, giving it the characteristic heart-shaped section. Sufficiently high steam velocities to sweep condensate and air films from the tubes are maintained throughout the condenser by this construction, which compensates for the decreased volume of the steam as it is condensed in its passage down over the tubes. The residual air and steam from the last row of tubes is drawn up into the cooler which is mounted on the side of the shell proper and fitted with cast iron cooling grids whose surfaces are particularly adapted to devaporize and cool the air before it passes to the vacuum pump. The withdrawal of the non-condensibles at the bottom of the shell and the use of a multi-stage tube arrangement and correct shell shape is said to assure active flow of steam over every tube and preclude pocketing and stagnation.

The elimination of waste tubes in this way is claimed to result in a large saving in maintenance and renewal costs.

The number of holders of United States Steel common stock at closing of books for June dividend was 99,512, the lowest figure since December, 1920, and comparing with 106,811 in March, a decrease of 7299 in three months. Preferred stockholders at closing of books for May dividend numbered 81,446, compared with 81,865 in February and 81,621 in November, 1921.

Adoption of Uniform Cost Accounting

WASHINGTON, July 4.—Malleable castings, pressed steel, steel barrels and power piping and stoves are included among approximately 120 commodity lines which have adopted uniform cost accounting methods, according to a survey just completed by the Fabricated Production Department of the Chamber of Commerce of the United States. A statement issued by the department says that 40 lines have gone the whole distance in adoption of uniform cost systems and in securing general use of them in their industries. About the same number have adopted complete uniform methods and are now facing the important problem of installing such systems, while the remainder have only worked out plans for simplification of accounts.

While making the survey the department received scores of letters from trade associations and individual manufacturers pointing out the benefits of uniform cost accounting. Some of the advantages enumerated are:

It strengthens position of industry in dealing with Governmental or regulatory bodies.

It inspires confidence that selling prices are determined upon a fair and equitable basis.

It solves disputed points of accounting within the industry authoritatively.

It makes possible a more intelligent competition.

It reveals lines within the industry which have been marketed on an unprofitable basis.

It shows the danger line below which goods cannot be sold at a profit, thus serving as an insurer of profits.

It acts as a common guide to the value, efficiency and waste of workers, machines, methods, operations and plants.

It becomes a reliable guide and basis for estimating prospective business, thus acting as a forerunner for comprehensive production statistics.

It furnishes current reports for comparing major cost items with standards, which are predetermined and thereby measuring and increasing operating efficiency.

It establishes a standard code of accounting practice, so that if your cost clerk or bookkeeper leaves you, his successor will step into a system whose operation has been fully and completely formulated.

In announcing the result of the investigation the department let it be known that it stands ready to suggest the various means by which interest in cost methods can be so aroused that manufacturers will demand uniform cost accounting, rather than have it thrust upon them.

To illustrate what is meant by a uniform cost system the department analyzes some of the systems actually in operation. It calls attention to the flexibility and their adaptability to accounting in the particular industry. The following analysis is made of uniform cost accounting as it applies to malleable castings:

Classification of accounts and departmentalization of industry.
Standard definition of cost accounts.
A method of distributing fixed plant charges.
Standard practice covering the treatment of cost of metal, melting expense and the distribution of indirect costs.
How to arrive at the cost of metal poured.
Standard forms and statements:
- Distribution of fixed plant charges.
- Analysis and distribution of pattern shop costs.
- Statement of iron costs.
- Monthly cost statement.
- Statement of metal, melting and overhead rates.
- Casting summary cost record.
- Casting cost record.

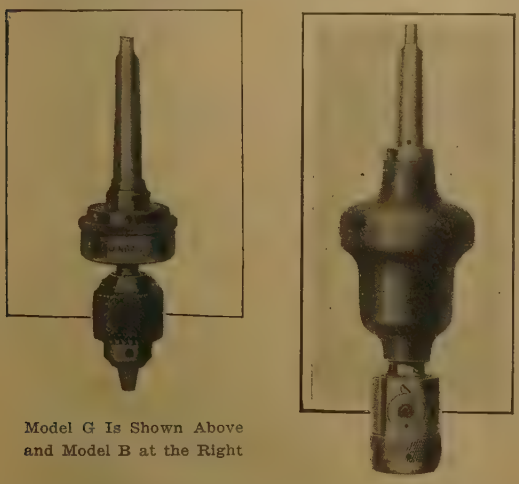
The following are among the associations which, the statement of the department says, have applied themselves earnestly to the establishing of a more uniform cost system: American Foundrymen's Association, American Malleable Castings Association, National Association of Brass Manufacturers, National Association of Stove Manufacturers, National Machine Tool Builders' Association, National Implement and Vehicle Association, Pressed Metal Association, Steel Barrel Manufacturers' Association.

Examinations for valuation engineer in general mining, coal mining, oil and gas and the forest industry are announced by the Civil Service Commission, Washington. The salary is $3,600 to $4,800 per year. Applicants should apply for form 1312. Papers will be rated as received, up to Sept. 1.

Plain and Back Geared Tapping Chucks

The accompanying illustrations show a group of tapping chucks recently placed on the market by the Landau Machine & Drill Press Co., 45 West Eighteenth Street, New York.

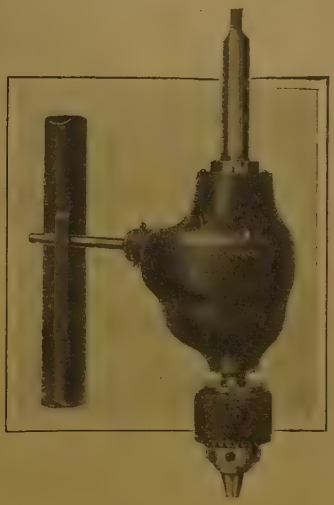
The chuck at the left, known as model G, is a friction tap holder which can be used with type B and E, also shown. It is made in three sizes and two styles, one style having a taper shank for use on a drill press or in the tailstock of a lathe, the other style having a straight shank with reversing sleeve for use in the turret head. The reversing sleeve can be furnished in any diameter from 1 in., minimum. Model B is a single-spindle tapping chuck which is driven from the main spindle of a drill press. It is



Model G Is Shown Above and Model B at the Right

equipped with ball bearings and reverses at higher speed than when tapping. The capacity of the model B chuck is up to ¼ in.

The model E, shown below, is a single-spindle back-geared tapping chuck, in which the ratio of reversing to tapping speed is 5 to 1. It is made for a No.'s 1 or 2 Morse taper and the capacity is for taps up to 7/16 in. The main drive is fitted with ball bearings and a standard chuck is used. The body or housing is comparatively small for a tapper of this capacity, the compactness being attributed to the back gear design. There are no protruding screws. The speed and special clutch design are said to result in greatly preventing tap breakage. The clutch will release on undue strain.



Back Geared Tapping Chuck, Model E. The ratio of reversing speed to tapping speed is 5 to 1

A model F, not shown, is similar to the model E, except that it has a tapping ratio of 3 to 1, the reverse speed being three times the tapping speed, and a capacity of from ⅜ to 1⅛ in.

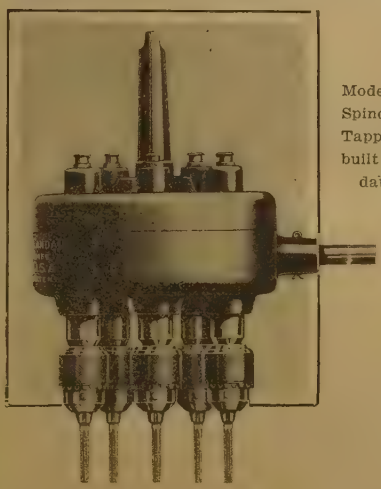
Back-Gear Tapping and Drilling Head.

A multiple spindle back gear tapping head, shown in the separate illustration, designated as the model H, is built to accommodate up to five spindles. The spindles are equally spaced about the circumference of a circle and the distance from the center of the driving spindle to the center of the tap is 2½ in. The main drive spindle is mounted on ball bearings. The tapping ratio is 4 to 1, the reversal being the faster. A standard drill chuck is used and essential parts are hardened and are interchangeable. The capacity is up to ¼ in. Clutches disengage when too great a strain is placed on the taps, which can be fed to the bottom of the hole, stopping automatically when meeting with an obstruction.

A multiple drilling head, known as the model K, is made for use in conjunction with the model H tapper. It is essentially of the same design, but is without the reversing mechanism. The main drive is fitted with ball bearings and the drilling spindles have standard taper shanks, also fitted with ball bearings.

Plants of Aluminum Mfrs. Leased

At a meeting of the stockholders of the Aluminum Mfrs., Inc., held in Cleveland, June 29, the proposed lease of the plants of the Aluminum Mfrs., Inc., to the Aluminum Co. of America, Pittsburgh, for a period of 25 years, was approved by the unanimous vote of the stockholders present. The Aluminum Mfrs., Inc., has plants in Cleveland, Detroit, Buffalo and Fairfield, Conn., for the manufacture of aluminum castings and forgings. For a number of years the Aluminum Co. of America has owned approximately a 50 per cent interest in the plants of the Aluminum Mfrs., Inc. The company has a stock issue of $5,000,000 in preferred stock and 325,860 shares of no par common stock. Under the terms of the lease the Aluminum Co. of America will pay rental sufficient to pay dividends on the preferred stock of the Aluminum Mfrs. and to retire a portion of this stock as provided under the charter and also sufficient to pay approximately $2 per share on common stock after 1926. No change is expected in the management of the plants of the Aluminum Mfrs., Inc., as a result of the lease. The officers of this company are: W. P. King, president and treasurer, George J. Stanley, vice-president in charge of production, and John H. Watson, secretary.



Model H Multiple Spindle Back Gear Tapping Head. It is built to accommodate up to five spindles

The Brier Hill Steel Co., Youngstown, is erecting a six-story office building on West Federal Street, opposite its open-hearth furnace department. The building will house the company's executive, accounting and operating officers and staffs.

Iron and Steel Exports Gain Heavily

Highest Exports Since March, 1921—Rails, Black Sheets, Structural Shapes, Pipe and Wire Share in Increase—Imports Higher

WASHINGTON, July 3.—Exports of iron and steel in May, amounting to 230,062 gross tons, valued at $29,456,349, brought the total to the pre-war monthly average and at the same time showed a sharp recovery over the April total, which aggregated 198,830 tons, valued at $17,563,662. For the 11 months ending with May of the current year the total was 1,498,993 tons, valued at $281,735,991, as compared with 4,117,239 tons valued at $739,214,697 for the corresponding period one year ago. The May movement of this year was the largest since March of last year, which exceeded it only slightly, amounting to 230,635 tons.

Imports of iron and steel and of manganese ore as well as exports of machinery also showed gains in May. Imports of iron and steel aggregated 23,093 tons valued at $2,966,332, as compared with 18,417 tons valued at $2,888,790 in April. For the 11-month period ending with May, the total of imports amounted to 147,391 tons valued at $95,955,369, as compared with 246,336 tons valued at $41,696,151 for the corresponding period of last year. Imports of manganese ore in May aggregated 46,517 tons, valued at $307,571, as compared with 25,559 tons valued at $133,715 in April; for the 11-month period the total was 212,879 tons, valued at $1,226,133.

Exports of machinery in May were valued at $19,415,994, as compared with $19,191,148 in April. For the 11-month period the total value was $222,427,107. The largest machinery items exported in May were textile equipment and agricultural machinery, which amounted to $1,520,512 and $1,603,574, respectively. The exports of lathes were valued at only $66,604.

Exports of Iron and Steel—Gross Tons

	May		Eleven Months Ending May	
	1921	1922	1921	1922
Pig iron	2,541	3,897	123,992	26,334
Ferromanganese	.....	41	3,335	966
Ferrosilicon	2	42	525	405
Scrap	4,146	12,804	178,891	52,136
Ingots, blooms, billets, sheet bar, skelp	749	13,091	81,443	49,949
Iron and steel bars	5,905	26,544	499,138	83,106
Alloy steel bars*	.....	174	.....	4,444
Wire rods	2,642	4,367	61,075	37,558
Plates, iron and steel	18,518	16,879	753,222	110,007
Sheets, galvanized	3,042	9,487	90,211	71,544
Sheets, black steel	7,686	34,619	145,533	275,505
Sheets, black iron	1,264	584	24,451	5,918
Hoops, bands, strip steel	915	2,539	37,128	22,001
Tin plate, terne plate, etc.	1,593	6,291	175,551	70,391
Structural shapes, plain material	17,926	18,132	508,424	107,224
Structural material, fabricated	419	4,242	30,138	20,901
Steel rails	23,492	23,812	529,252	196,490
Rail fastenings, switches, frogs, etc.	289	3,011	13,520	18,587
Boiler tubes, welded pipe and fittings	41,312	15,589	418,631	143,139
Cast iron pipe and fittings	4,124	2,709	72,411	24,691
Plain wire	2,961	12,836	163,328	72,567
Barbed wire and woven wire fencing	1,027	7,791	85,180	33,538
Wire cloth and screening*	.....	143	.....	452
Wire rope and cable*	.....	343	.....	.....
Wire nails	709	5,797	71,761	46,611
All other nails and tacks	191	810	12,872	6,213
Horseshoes	12	109	1,472	653
Bolts, nuts, rivets and washers, except track	1,286	1,313	35,988	12,752
Car wheels and axles†	.....	686	.....	.....
Iron castings†	.....	972	.....	4,504
Steel castings†	.....	204	.....	.....
Forgings†	.....	187	.....	.....
Machine screws†	.....	17	.....	75
Total	142,551	230,062	4,117,239	1,498,993

*Not reported separately, prior to January, 1922.
†Previous to January, 1922, reported by value only.

Imports of Iron and Steel—Gross Tons

	May		Eleven Months Ending May	
	1921	1922	1921	1922
Ferromanganese	75	5,213	42,932	17,624
Ferrosilicon	182	588	6,841	9,493
Pig iron	15,276	4,476	60,471	34,622
Scrap	524	7,292	81,285	40,969
Steel bars	75	1,053	4,177	4,485
Bar iron	314	49	3,782	2,651
Structural steel	72	237	1,322	1,371
Billets, without alloys	.....	823	750	10,963
All other billets	117	180	3,165	941
Steel rails	6,254	2,962	34,998	22,519
Sheets and plates	359	34	1,548	305
Tin and terne plates	14	84	477	292
Wire rods	11	102	4,588	1,156
Total	23,573	23,093	246,336	147,391
Manganese ore and oxide	54,663	46,517	665,601	212,879

MACHINERY EXPORTS
By Value

	May, 1921	May, 1922	Eleven Months Ending May, 1921	Eleven Months Ending May, 1922
Locomotives	$2,647,441	$278,167	$42,313,209	$17,350,752
Other Steam Engines	27,126	9,323	478,419	51,064
Boilers	236,678	55,252	8,684,615	1,351,775
Accessories and Parts	.....	717,028	.....	*482,036
Automobile Engines	248,637	616,128	2,536,811	3,124,168
Other Internal Combustion Engines	403,136	302,707	9,839,550	2,756,703
Accessories and Parts for	.....	509,802	.....	*1,116,771
All Other Parts of Engines	766,249	.....	19,650,065	†3,251,595
Complete Tractors, except Agricultural	35,344	2,435	19,673,808	257,280
Electric Locomotives	274,511	.....	572,982	†1,339,190
Other Electric Machinery and Apparatus	2,132,800	875,694	33,906,464	14,774,031
Excavating Machinery	348,335	.....	2,632,008	†710,339
Concrete Mixers	25,116	39,596	982,924	365,991
Road Making Machinery	109,995	.....	1,100,736	†414,539
Elevators and Elevator Machinery	155,842	.....	1,935,319	†552,821
Mining and Quarrying Machinery	688,326	380,930	9,141,903	3,923,915
Oil Well Machinery	1,039,667	.....	10,773,031	†3,146,283
Pumps	743,498	425,405	15,976,426	5,079,950
Lathes	269,835	66,604	5,244,550	961,285
Boring and Drilling Machines	.....	69,424	.....	*266,448
Planers, Shapers and Slotters	.....	17,590	.....	*95,741
Bending and Power Presses	.....	15,806	.....	*207,794
Gear Cutters	.....	6,174	.....	*22,446
Milling Machines	.....	25,255	.....	*107,053
Sawing Machines	.....	2,930	.....	*20,590
Thread Cutting and Screw Machines	.....	17,668	.....	*71,649
Punching and Shearing Machines	.....	12,610	.....	*75,884
Power Hammers	.....	13,188	.....	*52,827
Rolling Machines	.....	16,270	.....	*23,919
Wire-drawing Machines	.....	2,248	.....	*4,134
Polishing and Burnishing Machines	.....	83	.....	*8,794
Sharpening and Grinding Machines	82,183	83,104	2,515,999	763,411
Other Metal Working Machinery and Parts of	923,953	308,383	25,191,658	6,138,679
Textile Machinery	1,387,118	1,520,512	22,468,133	16,083,407
Sewing Machines	631,809	504,674	10,796,308	5,036,771
Shoe Machinery	88,994	79,748	2,691,430	915,494
Flour-Mill and Gristmill Machinery	247,709	97,703	2,180,176	956,338
Sugar-Mill Machinery	925,866	184,276	27,511,937	3,897,737
Paper- and Pulp-Mill Machinery	157,993	.....	3,453,677	†1,376,074
Sawmill Machinery	90,130	33,569	1,337,513	546,869
Other Woodworking Machinery	193,488	88,996	3,725,058	982,708
Refrigerating and Ice-Making Machinery	71,850	177,877	3,288,132	1,700,700
Air Compressors	205,139	285,430	5,382,697	1,749,559
Typewriters	757,192	1,136,860	18,143,716	9,383,558
Power Laundry Machinery	79,366	68,030	1,082,832	509,912
Typesetting Machines	263,911	432,996	4,369,877	3,046,561
Printing Presses	626,133	266,703	10,026,628	4,467,217
Agricultural Machinery and Implements	3,275,126	1,603,574	48,081,651	17,236,251
All Other Machinery and Parts	11,127,159	8,065,242	183,510,313	85,668,094
Total	$31,287,655	$19,415,994	$561,200,355	$222,427,107

*—January 1, 1922, to May 31, 1922.
†—July 1 to December 31, 1921

As is shown by the accompanying table of exports by countries, Japan continued in May its first position as the leading foreign market for American iron and steel. Of the 34,619 tons of black steel sheets exported in May, the largest single item of export, that country took 28,211 tons, or 81 per cent, while of the 26,544 tons

Exports of Some of the Leading Steel Products to Principal Countries of Consumption

	May, 1922	11 Months Ending May, 1922
Plates		
China	6,083	8,003
Canada	5,427	53,683
Black Steel Sheets		
Japan	28,211	230,690
Canada	3,770	26,475
Rails		
Japan	11,612	82,323
Canada	3,425	27,187
Wire		
Japan	3,353	30,747
Argentina	2,741	7,199
Australia	1,811	4,867
Canada	1,428	12,602
Wire Rods		
Japan	2,416	.....
Canada	1,522	.....
China	316	.....
Hoops and Bands		
Canada	1,035	.....
Tin Plate		
Japan	2,301	.....
Canada	1,836	.....
Argentina	489	.....
Chile	359	.....
Cuba	330	.....
Brazil	289	.....
Structural—Not Fabricated		
Japan	8,097	.....
Canada	6,455	.....
Iron and Steel Bars		
Japan	13,245	.....
Canada	5,017	.....
Skelp		
Canada	9,024	.....
Scotland	2,224	.....
Scrap		
Japan	5,892	.....
China	4,225	.....
Italy	1,505	.....
Hongkong	979	.....
Pig Iron		
Canada	2,110	.....
England	1,205	.....
Ingots, Blooms, E'c.		
Canada	1,816	.....

of iron and steel bars Japan took 13,245 tons or practically 50 per cent. It also led in six other items, as is shown in the table.

Products which showed sharp gains in exports in May over April include black steel sheets, steel rails, plain structural shapes, boiler tubes and welded pipe and plain wire.

Exports, January, 1920, to May, 1922, Inclusive

	Gross Tons		
	All Iron and Steel	Pig Iron	Semi-finished Material
Calendar year 1919...	4,239,837	309,682	258,907
January, 1920	333,601	18,468	19,937
February	308,185	15,739	22,693
March	417,216	22,740	30,444
April	395,120	14,608	19,032
May	420,359	13,032	16,370
June	402,707	17,075	29,811
Fiscal year 1920.....	4,212,732	248,126	288,766
July	458,866	29,647	17,243
August	431,484	22,645	20,920
September	409,200	22,724	18,113
October	452,015	17,296	11,853
November	434,297	13,929	7,042
December	498,765	10,055	3,415
Calendar year 1920...	4,961,851	217,958	216,873
January, 1921	547,394	3,710	315
February	393,328	1,307	92
March	230,635	2,320	1,023
April	162,592	1,234	678
May	142,551	2,541	749
June	119,081	1,689	1,106
Fiscal year 1921.....	4,168,610	129,541	82,549
July	86,523	2,744	363
August	75,827	2,424	2,447
September	95,169	3,078	1,318
October	106,532	2,830	153
November	122,290	1,299	1,869
December	134,415	2,550	250
Calendar year 1921...	2,213,042	28,305	10,363
January, 1922	160,920	1,043	4,683
February	133,975	1,430	6,627
March	208,843	2,724	10,002
April	198,830	2,750	9,376
May	230,062	3,897	13,091
Eleven months	1,498,993	26,344	51,423

Next to scrap, ferromanganese constituted the biggest single item of imports in May, amounting to 5213 tons, which appears to be due to the impending duty that has been placed on this product in the new tariff bill. Scrap imports totaled 7292 tons, while pig iron imports, ranking third, amounted to 4476 tons.

Tests of Bricks Made from Slag

For utilization of blast furnace slag in making slag bricks, the following scheme is proposed by E. P. Gangewere, Lehigh University, who has patented the idea:

1. Discharge slag directly from furnace into cars filled to depth of several feet with water.
2. Place disintegrated slag into centrifugal drier.
3. Run product through pulverizer, crushing slag to such a degree that 75 per cent will pass through a 100-mesh sieve.
4. Mix one part of cement to twelve parts of powdered slag, adding small amount of water.
5. Mold the resulting mixture in presses to bricks of standard size.

The bricks thus produced from slag of Bethlehem Steel Co. furnaces at Bethlehem, Pa., have been tested at the Fritz Engineering Laboratory at Lehigh University by Mr. Gangewere, who reports the following results:

Transverse tests, with supports ⅝ in. from each end; width, 2 5/16 in.; depth, 4 in.; span, 7 in.; average breaking load, 7000 lb.

Compression test with bricks set on edge after being broken in half. The following area was subjected to compression: length, 4 3/16 in.; breadth, 2 5/16 in.; average breaking load, 80,000 lb., or ultimate strength of 8500 lb. per sq. in.

Absorption test. In a period of eleven days the bricks absorbed 7.15 per cent of their weight in moisture.

In subjecting the bricks to a double-shearing test they failed at a unit load of 1650 lb. per sq. in.

The results are taken to show that bricks produced from blast furnace slag have a strength far above the average produced from shale or clay. The texture of the bricks is uniform, and an even, smooth surface results from this method of manufacture.

The cost of producing this product is claimed to be far less than that involved in making bricks from clay or shale, and the whole process can be operated in conjunction with any blast furnaces.

The specifications of the American Society for Testing Materials for vitrified building brick call for 5000 lb., the average minimum compressive strength, tested on edge and an absorption limit of 5 per cent or less after five hours' boiling, or 5 to 12 per cent in the case of hard brick.

The United States Government investigated the cost of making common clay brick on the Hudson River in 1920, and found it to be $13.19 per thousand, plus $3.93 per thousand for barge transportation to New York, making the delivered cost $17.12 per thousand. Such brick is now selling at $18 to $24 retail, while a good grade of vitrified brick will bring around $40.

In an endeavor to direct the attention of foreign-born employees to the citizenship classes conducted by public schools, the Bureau of Naturalization of the United States Department of Labor is offering employers for display in the shop any number of posters calling attention to the free government textbooks and advantages of enrollment. It is also asking data on the number of employees various companies have assisted in obtaining naturalization, the success of public school classes, classes in the plant, etc. Suggestions are called for in the belief that a compilation of such information will be helpful to all industry.

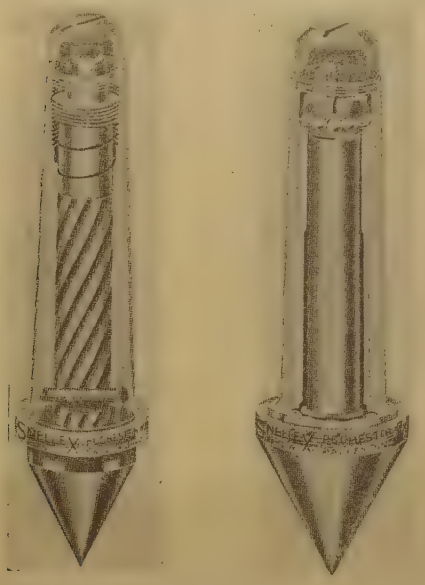
For using anthracite culm as a boiler fuel, the Susquehanna Collieries Co. at Lykens, Pa., has increased its equipment of pulverizers by the purchase of two 42-in. Fuller-Lehigh mills. The steam plant includes six 600-hp. Edgemoor boilers.

Centers for Lathes and Grinders

An anti-expansion center and an anti-friction center, as shown in the accompanying illustrations, have been placed on the market by the Snellex Mfg. Co., Rochester.

The anti-expansion center is for lathe headstocks and releases automatically the pressure caused by expansion of the work. It is said to save adjusting of expansion at the tailstock, ragged or burnt center-points, heavy side-wear on the headstock bearing, buckling of small diameter work, or slippage of drive belts.

The center releases the force of expansion by withdrawing in the sleeve as far as the work expands, the movement being limited by a stop pin. A spring device, which is of a solid piece of tool steel and has no hole,



The Anti-Expansion Center Is Shown at the Left, and the Anti-Friction Center at the Right

is located at the end of the center and is adjustable to equalize the cutting pressure. An oil-grooved stem is provided and is accurately fitted in the sleeve. Lubrication is through an oil hole in the adjusting screw. All parts are hardened and are fitted to assure lasting accuracy in production to within one ten-thousandth of an inch.

The anti-friction center is for lathes and grinders and turns with the work, on ball bearings. It is intended to eliminate friction on the center point, and to save lubrication of center holes, worn centers and spoiled work therefrom, re-grinding centers, and chattering of work. The ball bearings will carry the load without chatter. The ball races are formed in one piece with the center parts and their angular position gives the balls a spinning, as well as a rolling motion, which keeps the balls round and uniform in size. The cone is keyseated with the stem and is adjustable to compensate for wear of the ball bearings, the adjusting nut being split on one side. The center holds enough oil to lubricate the bearings for a month and is sealed by an oil cap and a dust guard to prevent entering of chips or dirt. All parts are hardened and precisely finished to permit of accuracy of production to within one ten-thousandth of an inch.

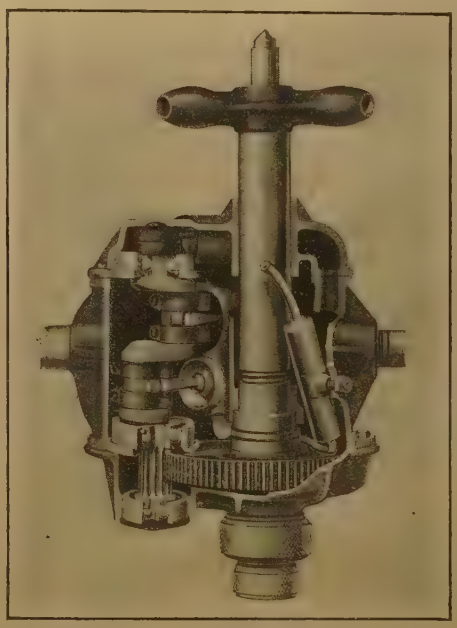
Bessemer Plant Resumes

Current operating schedules of the Republic Iron & Steel Co. provided for the resumption July 5 of its Bessemer department at Youngstown, following a protracted suspension. Except for a 90-day operating period in 1921, this department of the Republic company's plant has been idle since late in 1920. Its operation follows closely the lighting of a third blast furnace in the company's Haselton group. The Bessemer plant was scheduled for operation in April, but the coal miners' strike prevented its resumption at that time. Meanwhile the company has been purchasing its Bessemer steel requirements in the open market.

Air Drill with New Features

The Little Giant air drill of the Chicago Pneumatic Tool Co., New York, will be equipped with a new feature known as the Oil Vent which is designed to prevent oil leakage and to obviate the necessity of frequent oiling of the machine. Another feature that will be incorporated is the Invincible one-piece interchangeable toggle, which, among other advantages, provides a large opening at the top and bottom of the toggle bearing, permitting lubricant to come in direct contact with the crank pins.

The arrangement of the Oil Vent may be seen in the illustration. It is applicable to most sizes and types of the Little Giant drills, it being provided as regular equipment on new drills, but being also attachable to machines now in use. It contains a sliding plunger intended automatically to prevent oil leakage regardless of the operating position of the drill. The new



Pneumatic Drill with Oil Vent Feature to Prevent Oil Leakage and Obviate Frequent Oiling

device is claimed to effect considerable saving of time, labor and lubricant.

In the one-piece interchangeable toggle the toggle bearing and connecting rod are integral and are held in place in pairs by means of hinged split collars. The toggle mechanism may be assembled or disassembled without dismantling the drill. A 30 per cent reduction in weight is claimed for the new arrangement.

Production of the Truscon Steel Co., Youngstown, Ohio, is running close to normal, and business is well sustained, according to a statement by President Julius Kahn. "We never had a larger volume of business in the history of the company than at the present time," he states. "We are getting foreign orders as well as a variety of domestic business. Our steel supplies are satisfactory. Unless interrupted by coal shortage or a rail strike, business is likely to be maintained at this rate for some time." The company is an important fabricating interest manufacturing a variety of steel products entering into fireproof building, road and bridge construction.

Industrial Course at Pennsylvania State College

The seventh annual summer session in industrial organization and administration will be held at the Pennsylvania State College from Aug. 28 to Sept. 9 under the immediate direction of Prof. Edward J. Kunze, assisted by Prof. J. O. Keller and P. P. Henshall of the department of industrial engineering.

The course is an intensive one, designed to meet the needs of manufacturers, superintendents, personnel directors, accountants, production managers and all others who pilot the affairs of industry.

Its purpose is to assist men in the development of their jobs, to broaden their horizon of the possibilities of the science of management and to illustrate to them by practical examples the most effective methods of modern organizations. It is not a theoretical resume of a batch of reading material but rather a careful consideration of the theory in its application.

The work is divided into discussions on industrial organization, manufacturing methods, employment, industrial relations, factory planning, material and production control, scheduling and dispatching, purchasing, cost accounting, and kindred subjects. The greater portion of the time is devoted to practical installation methods, using the equipment of the five shops and the other facilities of the department that have been especially designed to handle this type of work.

Besides the discussions and laboratory applications, provision has been made for group conferences, a feature which last year brought forth so much favorable comment. The benefit to be derived from intimate contact with others whose problems are mutual and the valuable acquaintanceships formed make this group conference feature a very valuable one.

The different lines of manufacture followed by those who have attended former sessions have been varied. It has been the custom for many companies to send one or more of their executive staff to attend the course and report back not only along the specific line of the attending executive but also along such other lines as may indicate or provide solutions to needs of the company.

Bulletins describing the course may be obtained by addressing Prof. Edward J. Kunze, State College, Pa.

John Fritz Medal Awarded Marconi

The John Fritz Medal, one of the highest distinctions bestowed by the engineering profession in this country, has been awarded for 1922 to Senator Guglielmo Marconi, the inventor of wireless telegraphy.

The medal will be formally presented to Senator Marconi at a gathering of engineers to be held in the Engineering Societies Building, New York, Thursday evening, July 6.

Prof. C. A. Adams, Harvard University and chairman of the John Fritz Medal board of award, has appointed the following committee to arrange for the presentation ceremonies: Benjamin B. Thayer, New York, chairman; George S. Webster, Philadelphia; Walter M. McFarland, New York; William McClellan, Philadelphia.

Simplification in Manufactures

In connection with the investigation by various technical societies into methods calculated to bring about simplification in sizes and varieties of commodities, all in accordance with the request of Secretary of Commerce Hoover, the American Engineering Standards Committee has appointed W. A. Durgin, chief of the division of simplified practice of the Department of Commerce, a member of the standards committee, and A. A. Stevenson, former chairman of the standards committee, has been appointed a member of an advisory committee to the division of simplified practice.

The membership of the American Society of Mechanical Engineers has been asked, through the eleven professional divisions of the society, to supply the suggestions desired as to what things may be done in the interest of simplification. Those in charge would, as a matter of fact, like to have anyone who is in a position to do so to give thought to the manufactured articles he is in touch with and consider the possibilities of standardization. Thus he may help in the efforts to reduce waste in industry.

Hadfield Scholarship for Sweden

Sir Robert A. Hadfield has presented to the Metallografiska Institutet, Stockholm, Sweden, a scholarship of £150 per year for two years. This is to be made available to a young scientist for carrying on special research work at the institute, and has been given as "an expression of the debt of gratitude which the world owes to Swedish science." He called particular attention to the contributions of the early Swedish workers in the practical metallurgy of iron.

At the inauguration of the institute, Dr. Carl Benedicks, the director, referred to the lead in modern metallurgy which England had taken, mentioning particularly Henry Clifton Sorby and Sir Robert A. Hadfield, both of Sheffield. He paid touching tribute to the recent great loss which the metallurgical world had sustained in the death of Prof. Henry M. Howe, of New York.

It was the pioneer work of the early Swedish scientists, more than a century ago, which gave the world the first alloy steels. And Bergman, the founder of analytical chemistry, showed the influence of carbon on iron and first defined and differentiated pig iron, wrought iron and steel.

National Safety Council Meeting Aug. 28.

The National Safety Council, 168 North Michigan Avenue, Chicago, will hold its eleventh annual meeting in Detroit Aug. 28 to Sept. 1, inclusive. A special program has been arranged for the metals section, of which J. R. Mulligan, safety inspector of the Bethlehem Steel Co., is chairman. J. A. Northwood, safety engineer, Cambria Steel Co., is vice-chairman, and Walter Hart, safety inspector, Jones & Laughlin Steel Co., is secretary. The program will include reports of officers and committees and several addresses, among which these have been announced: "Outstanding Features of the Safety Movement in Iron and Steel, 1910-1919," by Dr. L. W. Chaney, United States Bureau of Labor Statistics, Washington; "Safety in Electric Furnace Operation," by E. T. Moore, electrical engineer, Halcomb Steel Co., Syracuse, N. Y.; "The Safe Handling of Gas at the Blast Furnace" and "Safety in Crane Repairing," for which no speakers have yet been announced.

There will be a joint meeting of the automotive, drop forge and metals sections on Friday, Sept. 1, at 9 a. m.

All meetings will be held in the new Cass Technical High School, which has just been completed. This building has an auditorium with a seating capacity for 3000 persons. Other rooms are available in the same building for sectional and committee meetings.

Personnel Changes in Standards Committee

The American Engineering Standards Committee, 29 West Thirty-ninth Street, New York, announces the following additions and changes in personnel:

F. J. Schlink, formerly of the development branch of the engineering department of the Western Electric Co., New York, has been appointed assistant secretary of the committee.

The Electrical Manufacturers Council has appointed A. L. Doremus, Crocker-Wheeler Co., New York, as alternate for A. H. Moore, on the main committee of the American Engineering Standards Committee.

The gas group has appointed W. J. Serrill, United Gas Improvement Co., Philadelphia, Pa., as alternate for A. H. Hall on the main committee.

The U. S. Navy Department has designated Commander Harvey Delano, bureau of ordnance, Washington, to represent the Navy Department on the main committee.

The U. S. War Department has appointed Maj. Glen F. Jenks, ordnance department, U. S. A., Washington, as alternate to Brig.-Gen. W. S. Pierce, ordnance department, on the main committee.

WORLD TRADE IN MACHINERY

America's Premier Position Not Menaced by Germany, with Which We Have Exchanged Places Since 1913

The present position of Germany as a competitor in the world's machinery markets has been considerably overrated by many writers, says William Althoff, of the industrial machinery division of the Department of Commerce, in a special survey of the international situation in the forthcoming issue of *Commerce Reports*. Mr. Althoff's conclusions are that America's premier position, which it has captured from Germany since 1913, is not menaced by Germany, whose exports of industrial machinery are now in value well below those of Great Britain, our present closest competitor for first place.

During the years 1910-1913, inclusive, as shown by charts and tables prepared by Mr. Althoff, Germany, the United Kingdom, France, and the United States exported annually a total average of approximately $530,000,000 worth of machinery. Throughout this period Germany held first place, but its proportion fell from 45.1 per cent of the total of these countries in 1910 to 43.6 per cent in 1913. The proportion of the United Kingdom also declined continually during these years, and in 1913 its share was only 28.8 per cent as against 33.1 per cent in 1910. The United States, on the contrary, secured a larger proportion each successive year, rising steadily from 17.1 per cent of the total in 1910 to 20.9 per cent in 1913. In value this represented an increase of almost $57,000,000.

In 1918 and 1919 the United States, as was to be expected, furnished the bulk of the machinery exports, the actual amounts being $282,000,000 and $378,000,000 respectively.

During 1920 Germany was again in the field, the total of the four countries ascending well on toward a billion dollars. Of this the United States supplied nearly one-half (48.9 per cent), the United Kingdom 24.6 per cent, and Germany 20.8 per cent.

The United Kingdom alone of the four countries shows an increase in the value of its exports for 1921, due largely to heavy shipments of textile machinery on orders that had long been unfilled. Machinery exports from the United States fell off considerably during 1921, this being due in a large measure to the reduction in unit prices and to the extraordinary exchange situation that prevailed in the world markets.

It should be particularly noted, however, that our machinery exports last year exceeded in value those for 1918, and were more than twice as great as in 1913.

In other words, during 1921 we exported machinery to the extent of $290,000,000 or 36.2 per cent of the total of the four countries combined, as against $130,000,000 or 20.8 per cent of the 1913 total.

The outstanding feature of the figures presented herewith is that in 1920 and 1921, Germany, in spite of the advantages of favorable exchange rates, low wages Government subsidies, etc., exported only about one-half the proportion it shipped during the pre-war period.

Fundamental conditions at present existing in Germany are such as to seriously impair its position as a competitor in the world machinery markets. To a large extent its low costs have been the result of direct and indirect Government subsidies which the German Government must necessarily abandon. Government control as applied to grain prices has already been abolished, bringing about a general movement for higher wages. Freight rates and raw material prices are rising rapidly, and labor difficulties are becoming increasingly numerous. There is a shortage of both coal and coke. The forced internal loan contemplated by the German Government will undoubtedly be demanded in the near future. The amount is about one billion gold marks, equivalent at present to approximately 70 billion paper marks. This loan will be a heavy burden on industry. The supplementary taxation that must necessarily follow will raise production costs still higher. Furthermore Germany is becoming sold out and the continuation of production will involve increased purchasing of raw materials from outside sources at prices which will be almost beyond the German buyer, although in line with the world markets.

These and other factors make it practically impossible to quote firm prices for long-term commitments. The tendency now is to quote prices subject to increases to cover any enhanced production costs that may occur before the goods are delivered. The cancellation of numerous orders placed in Germany by foreign customers is reported.

All of the above conditions have a further peculiar significance when it is remembered that during recent years German supplies had already found it difficult to deliver machinery in accordance with prices and delivery dates contracted.

Graphite Electrodes for Resistor Elements in Electric Furnaces

To provide electric heat treating furnaces capable of high temperature work, such as necessary in treating manganese steel and other alloys and also in forging and billet heating, the use of solid graphite electrodes as resistors has been developed by F. J. Ryan & Co., Philadelphia. It appears that such construction was begun on the first practical furnace about seven months ago and furnaces of the type are now under construction to meet a demand for temperatures of 2800 to 2900 deg. Fahr.

The designs contemplate the placing of the resistors in any part of the furnace to secure uniform heat treatment, and the company claims that temperature ranges of 1000 to 3600 deg. are feasible. The general arrangement is such that a single resistor can be changed without interfering with the operation of the furnace or necessitating the opening of the center chamber.

F. J. Ryan, president of the company, says that in melting practice it is not expected that furnaces for use on iron alloys will be built with more than 750 lb. holding capacity, but he does not limit the capacity for non-ferrous melting. In heat treating, he says it is possible to build any size or dimension to meet conditions. The principle described is used in melting work and three of a new nose tilt design, automatically controlled, have been built for the alloy plant of the Bario Metal Corporation under a guarantee of temperatures for melting alloys from 3200 to 4000 deg. On present furnaces, it is stated that tungsten and chromium alloys have been melted from the cold condition in 25 to 30 minutes.

New Commodity Divisions

WASHINGTON, July 4.—Beginning with the new fiscal year, the Department of Commerce added three commodity divisions to those already created. They include the chemical division, headed by C. R. Delong of Ohio; the banking and investment division, headed by G. M. Jones of New York and the specialties division, headed by Edward Morse of Boston. This makes seventeen commodity divisions now installed within the department. It also has added a mineral section, beginning July 1, to the iron and steel division.

The Personnel Research Federation has established a monthly journal, published by Williams & Wilkins Co., Baltimore. The first number, dated May, contains an article by President James R. Angell of Yale University, on the reasons for personnel research, by Alfred D. Flinn, secretary of the Engineering Foundation and of the Personnel Research Federation, on the development of the federation, and by C. S. Yoakum, of the Carnegie Institute of Technology, on experiments in vocational guidance.

The Central Ohio Manufacturers Association, composed of manufacturers located in 12 Ohio counties, at its recent annual meeting elected T. R. Barnes, Barnes Mfg. Co., Mansfield, president. Other new officers are: first vice president, R. O. Parrott, Bucyrus; second vice president, F. B. McMillan, Mt. Gilead; third vice president, E. B. Phillips, Kenton; fourth vice president, F. E. Myers, Ashland; secretary-treasurer, W. P. Leonard, Mansfield.

Milling and Drilling Attachment

A universal milling and drilling attachment for the Rockford millers has been placed on the market by the Rockford Milling Machine Co., Rockford, Ill. It is a combination of two tools for use where there is considerable work to be done, which requires angular milling of surfaces or drilling at different angles.

The attachment is clamped by four bolts to the face of the machine column as shown in the accompanying illustration. There are two graduated bases at right angles to each other, both of which can be swiveled through 360 deg. This construction makes the spindle completely universal.

The drive is obtained by means of a geared connection from the back of the main spindle through a driving sleeve substituted in place of the overhanging arm. The same driving sleeve and intermediate gear as used with the company's standard vertical milling and slotting attachments is used. From the sleeve the drive is

Universal Milling and Drilling Attachment in Use Reaming a Taper Hole in a Cutter Head

through bevel gears driving a set of hardened steel bevel gears solidly mounted on a shaft and which drive a set of hardened steel bevel gears that drive the attachment spindle. This arrangement leaves the main spindle of the machine free, to be used as desired. On many jobs it is possible to do milling with a cutter inserted in the main spindle of the machine and angular milling or drilling at the same time.

A rack and worm feed is provided, which is a convenient feature for boring operations to close limits. This feed is obtained by loosening a thumb screw and moving the drill handle sleeve in, which throws it into clutch with the worm and rack. The rack and worm feed ratio is 48 to 1, that is, when using the worm feed, the feed is 48 times as fine as the hand feed.

There are 16 spindle speeds obtainable, ranging from 21 to 414 r.p.m., and drills 3/16 to 1¼ in. can be used advantageously. The spindle sleeve is graduated in inches and has an adjustment of 5 in., which increases the vertical range. On the inside of the spindle sleeve a take-up nut or the lower spindle bearing is conveniently located. Adjustment of the upper spindle bearing is independent of the lower and is made by means of an accessible nut.

The main spindle is of crucible steel and runs in phosphor bronze bearings, fitted with felts for retaining oil. The spindle hole is bored to No. 9 B & S taper. The net weight of the attachment is approximately 330 lb.

The Sumter Radio Mfg. Co. has leased suitable space and will manufacture radio parts aimed for quality rather than quantity.

New Potts Warehouse in Philadelphia

Horace T. Potts & Co., with a record of 107 years in the iron and steel business established in 1815 by the great-grandfather of the present active partners, are breaking ground on plot of about 10 acres on East Erie Avenue, Philadelphia, with a frontage on the Pennsylvania Railroad of 1042 ft. for new warehouses, office building, garage, machine shop, power house and watchman's residence. The total expenditure will be in excess of $500,000.

The office building will contain some 5400 sq. ft. for general office work and storage of records, and in addition will afford space for employees' rest rooms, locker rooms, lavatories, shower baths, restaurant and kitchen.

One warehouse 120 x 192 ft. will be equipped for dry and warm storage of cold finished steels, bands, hoops, sheets, wire, fencing, tool and alloy steels and light materials injured by dampness and rust. Dry air under forced pressure will be supplied to this building. Another building 75 x 369 ft. will be equipped to handle heavy and long sections up to 45-ft. lengths. Electric cranes, three of 7½ tons capacity and one of 3 tons capacity, as well as electrically driven saws, shears and punches, automatic scales, interplant railroad and trucking and up-to-date racks and storage facilities will be installed. The railroad siding will accommodate 10 cars at one time with unloading facilities either into truck or into warehouse.

The development of the autotruck and the call for prompt deliveries of material to distant points have made necessary the maintenance of a fleet of trucks and these and the automobile equipment of the sales department will be kept in repair in the company's own machine shop.

The Potts company has been a large importer of Swedish iron in the form of pig iron, wire rods in coils for making chain and rivets, bars, blooms for rolling into boiler tubes, melting bars for the manufacture of crucible steels and Swedish tool steels and anvils. The organization has also at times done an export business in iron and steel, largely with Australia, South America and the Orient.

At home it has developed a trade in tool and alloy steels and of other grades of steel and iron for various uses sold under its own special names and trade mark.

Employees can invest their savings in the business, receiving a guaranteed return of 7 per cent annually and with provision for withdrawal in full or part at any time. Group life insurance, beginning at $1,000 after six months' employment and running up by degrees to $3,000 after fifteen years, is carried at the expense of the firm. The purchase and owning of homes has been encouraged and aided.

By-Product Coke Plant for Mexico

The American Smelting & Refining Co. plans to build a by-product coke plant at Coahuila, in the district of Sabinas, Mexico, according to an announcement by William Loeb, Jr., vice-president of the company. Mr. Loeb was in Mexico in April conferring with President Obregon and other officials regarding the project. Construction work will not be begun until official authorization has been received from the Mexican Government and an agreement reached regarding taxation. The plant will cost about $7,000,000 and will include a model village with workmen's homes.

To discuss management methods and results in different localities, the management division of the American Society of Mechanical Engineers, in co-operation with the Society of Industrial Engineers and the Taylor Society, will provide for a series of meetings throughout the country in the week of Oct. 16 to 21. This special activity will be known as management week.

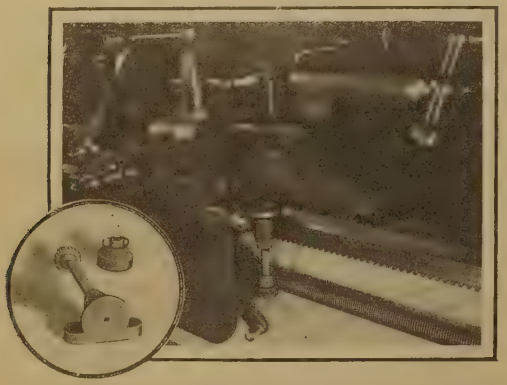
While the negotiations, whereby the General Refractories Co. will absorb several smaller companies, making fire clay and silica brick have not yet been concluded, they are progressing and an official announcement is expected in about a week or so.

Threading Dial for Lathes

The dial device shown in the illustrations is being placed on the market by James M. Colven, 20 Wolffe Street, Yonkers, N. Y., and is intended to facilitate thread cutting on engine lathes. It is known as the E-Z and is said to be easily installed on the carriage of any make of lathe by simply drilling and tapping two small holes.

The device is made up of a cast-iron bracket, a brass sleeve, a brass dial, a steel shaft and a brass worm gear suitable to the lead screw with which it is to operate. It serves for internal or external, odd or even right or left hand threads, and threads of any diameter or length. Threads can be cut close up to the shoulder without difficulty. In operating the device the operator has only to close the nut on the lead screw at the proper time, which the dial indicates, and open it when the tool has traveled the distance required, the lathe running continuously.

When cutting an even number of threads per inch the half nut can be engaged at any line on the dial, and



Attachment to Facilitate Thread Cutting on Engine Lathes. It permits continuous operation

when cutting odd threads the nut is engaged at any of the numbered lines on the dial. For half threads the nut is engaged at every half revolution of the dial.

With this device the lathe may be run continuously until the thread is finished, it eliminating the necessity of stopping and reversing the machine at the completion of each cut through the thread. Among the advantages claimed are that a backing or reversing belt is unnecessary and starting the lathe and not stopping it until the thread is finished, saves time and reduces the cost of cutting threads.

Saving Eyes by Goggles

ST. LOUIS, July 3.—How in 20 or 25 cases a year it is found that the vision of one or both eyes has been saved by the use of goggles, thereby saving a Pittsburgh steel company employing about 8000 men about $50,000 or $60,000 in compensation a year was related in a paper read last week by Dr. V. E. Van Kirk of Pittsburgh before the section on Ophthalmology of the American Medical Association. The subject was "Industrial Ophthalmology."

The paper represented a survey of 25,000 cases in a mill consisting of furnaces, open-hearth and Bessemer, rolling mills and the various co-ordinating departments. The medical and "safety first" departments were organized in the mill about 12 years ago. The paper says:

"The various types of goggles to be used in a mill should be inspected by the ophthalmologist with care, as many of them are not fit to be worn. The frames can be had in different weights for various kinds of work. The thickness of the glass varies also, but must always be a plain glass. The goggles must be in various sizes, so that all the men can be comfortably fitted.

"Goggles are worn by men in chipping or grinding, for example, where there is increased danger of eye injury. Plate glass shields are used on punches and like machines to protect the worker from chips of steel. Masks are worn by men pouring babbitt metal. Special goggles of various kinds are worn by men using the oxy-acetylene torch or electric arc in welding, furnace workers and others exposed to intense light.

"The employees are now on an honor system; a man who sees a fellow employee breaking one of the rules of safety first is justified in reporting him to the foreman. The penalty for failure to wear goggles when so ordered is rarely necessary now; the men realize the value of this protection."

Dr. George H. Cross, Chester, Pa., who led the discussion of the paper, said that of 13,008 accidents among employees of a large corporation, 5843 were injuries to eyes, as were 2000 of 3893 in another corporation. A factor in the large percentage of eye cases recorded was that the employees have been successfully educated to come to the ophthalmologist for even dust in the eyes, 536 reporting last year for the removal of a foreign body from the eye when there was none in it. The latter was regarded as an encouraging sign.

The principal objective for education, it was thought, should be the men in charge of industry. More men will wear goggles and adopt other safety measures if there are plant rules and factory owners must be shown that accident prevention will save money, it was said, for measures for avoiding and caring for injuries will be adopted in proportion as the leaders of industry are taught that they are measures of economy.

Improves Portable Air Tool

The Chicago Pneumatic Tool Co., New York, has devised what is called an oil separator for its Little Giant air grinders, which, it is claimed, permits continuous operation of the machine for 48 hr. or longer without replenishing the supply of lubricant.

The oil separator consists of a hollow perforated cylindrical steel shell attached at one end to the grinder spindle as shown in the sectional view herewith. At the other end it encircles and revolves around the vent tube. As the oil-laden air enters the holes in the separator, the centrifugal action separates the oil from the air, permitting the air to escape, oil-free, through the vent tube and preventing oil leakage.

The new feature is applicable to the larger sizes of Little Giant grinders and can be attached to such

Continuous Operation for 48 Hr. Without Replenishing Lubricant Is the Feature

grinders now in use. Considerable saving in lubricating expense is claimed because oiling is necessary but once a week instead of daily.

A new wire brush for removing rust and old paint is also an added feature of the company's air grinders. It consists of three units: a ⅛ in. dished back plate, a ⅛ in. front plate having a series of slots through which the wires project, and a wire brush made up of 30 renewable units of heat-treated crucible steel.

Suspension of coal mining in Pennsylvania has cost that state $200,000,000 to date, according to the State Commissioner of Labor. Loss of wages of 326,286 miners is placed at $94,420,755, of which $41,979,600 is in the anthracite fields and $52,441,155 in the bituminous fields. Loss to the operators is estimated to be $52,780,000 in the anthracite fields and a similar amount in the bituminous fields.

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An Unsatisfactory Tariff

The tariff bill as it stands to-day, much amended by the Senate in committee of the whole, may fairly be spoken of as more unsatisfactory than any of its predecessors. It was to be expected that the majority party would frame the schedules on a protective basis and therefore that these would more closely approach the rates of the Payne-Aldrich act than of the existing Underwood tariff. But no consistent policy has been followed in making the new schedules. Moreover, in many instances the existing duties have been so greatly increased that advocates of a moderate tariff, of whom there are many more in the ranks of life-long protectionists than at any time since revenue bills began to be made, have either made open protest or washed their hands of what they fear will be one of the most unpopular of all tariff acts.

It is granted that the public mind in its present state is highly receptive to any and all statements to the effect that special interests are having their way in the making of duties. More easily than ever any increase in existing duties can be put before the people as so much more added to the consumer's burdens for the benefit of domestic producers. War taxes are felt in every quarter; profiteering by retailers in many lines is still notoriously common. The purchasing power of many classes in the community has been cut down by the wage reductions of the past year. These conditions give uncommon weight to criticisms of the pending bill, particularly to criticisms to the effect that in many cases domestic producers have had their way completely in the framing of schedules in which they are interested.

As has been pointed out in these columns from time to time, the efforts of steel manufacturers have been more in the direction of urging that their raw materials be left free of duty or nearly so, than in securing high duties on their finished products. Their ability to export was an important consideration in this connection. Excessive transportation charges and the high labor costs of to-day, even after the reductions of 1921, have made the export position of our steel companies much more difficult than it was in 1913 when the Underwood bill was passed. There was hope that the Senate would reduce the House bill duties on manganese ore, ferromanganese, fluorspar, magnesite and some of the ores entering into the manufacture of special steels. But through the action of the agricultural bloc and various combinations of Senators representing sectional interests, the raw materials duties in the metal schedule have been retained substantially as the House passed them. The manganese ore duty is left at 1 cent per pound of contained manganese, or $11.20 per ton for a 50 per cent ore. The duty on 80 per cent ferromanganese was put at $33.60, instead of $39.42. The fluorspar duty was raised from $5 per ton in the House bill to $5.60. The House duties on crude and dead burned magnesite were finally put at one-half cent and three-fourths cent per pound, just as in the House bill. The House duties on ferrotungsten and ferromolybdenum and their ores were reduced somewhat, but in other duties affecting tool steel prices the changes are immaterial.

Both House and Senate bills continue the Underwood bill's concession to the farmer in free barbed wire, but protection consistency is asserted in respect to cotton ties, the Senate retaining the House bill duty of one-fourth cent per pound, whereas cotton ties are now on the free list.

Changes may yet be made in the metal schedule, as the bill comes up for final consideration in the Senate and later in conference committee, but no important departure need be expected from the policy already approved of imposing on the raw materials of steel manufacture duties that each year will add many millions of dollars to the cost of producing American steel.

That tariff-making under present world conditions and the unparalleled problems, industrial and fiscal, existing at home is a business of high hazard, is being demonstrated almost daily in the popular reactions to the provisions of the pending bill. To add to the uncertainties of domestic industries the form which the pending bill will finally take seems likely to make it short-lived. Radical changes by the next Congress are the well-nigh certain result of its enactment on substantially the present lines.

Large cities are evidently tiring of the expense of wooden stands for reviewing parades. From now on we have reason to expect that municipal officials

and their friends will see and be seen from stands of steel. Portable or sectional structures of fabricated steel can be knocked down and stored against the next celebration. In the long run they undoubtedly will be much cheaper than those of wood, and such a point of economy can be used against any greater first cost, not to mention the relatively little wear and tear of repeated assembly. A New York official has reported that the cost per seat for a stand accommodating 1000 persons is $5.78, and that the cost of cartage and erecting would be 93 cents per seat. Here is a business suggestion that should appeal to the recently organized association of fabricators, who are desirous of extending the applications of structural steel. Here also is an index to the cost of city entertaining. There are no statistics as to the annual number of occasions justifying such seating conveniences, but it is clear that each recipient of the municipal favor represents an outlay of nearly a dollar of the taxpayers' money merely for having his seat put in place. Used a few times a year and lasting, say, ten years, interest and amortization would easily bring the base cost of a seat, without considering the cost of the ticket, to $1.50; but we must have the stands, none the less.

International Testing Relations

While no action was taken by the American Society for Testing Materials, at its annual meeting last week, looking to a revival of the International Association for Testing Materials, there were indications of an undercurrent of sentiment favorable to such a movement. At the international session on cast iron, held by the American Foundrymen's Association in Rochester early in June, there was a strong sentiment for closer international relations on foundry questions, possibly in the shape of an association. Largely because of the Rochester session, the Testing Society's committee on cast iron formally voted a recommendation to the executive committee that international relations be made a subject of negotiation, with special reference to standardized tests for cast iron which might form a more satisfactory basis for comparisons. The Testing Society's retiring president, C. D. Young, in his annual address advocated "strong support for any movement which will again create an international association of testing engineers." Almost simultaneously comes word of the feeling in favor of an international foundrymen's association which was expressed at the recent convention and exhibition of the Institution of British Foundrymen.

There need be no underestimate of the difficulties in the way of reviving the International Association for Testing Materials on the old lines. Some countries represented in the old association are not likely to be participants in a reorganization movement at the start. Russia is one, and there are no indications of any effort to resume relations between German and Austrian engineering societies and those of the Allied countries. What is likely to come first is a movement in which American and British engineers would co-operate. Foundrymen in the two countries might well attempt to reach agreement on the size and shape of test bars that will best represent various classes of castings, and it will probably be found that mechanical testing will furnish sufficient scope for international effort in the foundry trade for a long time to come.

So far as the larger field of the Testing Society is concerned, the effort to revive international relations should be undertaken with a full appreciation of the narrow range of activities open to an international association. The last congress, held in New York ten years ago, showed that even on the matter of the nomenclature of steel the chance of agreement between the metallurgists of the United States and Great Britain was quite remote.

Business After Two Wars

In the Annual Review Number of THE IRON AGE of Jan. 4, 1917, there was given a collection of statistics showing what occurred industrially and commercially after our Civil War, 1861-65, and the Franco-Prussian war of 1870, the object being to furnish the reader with definite facts from which to draw conclusions concerning the years after the World War. Now that nearly four years have elapsed since the termination of hostilities an opportunity is afforded to make some comparisons.

The end of the Civil War was seen upon the investment of Richmond in 1864, although the termination of hostilities did not come until Lee's surrender to Grant at Appomattox Court House, April 9, 1865. It seems fair to take it that Germany surrendered at an earlier stage than did the Southern Confederacy, and if so, 1864 and 1918 are parallel years, so that in essence the summer of 1922 is as far after the World War as the summer of 1868 was after the Civil War. Parallelism or divergence is brought out by comparing years that are 54 years apart.

Following the Civil War there was, in general, a period of great industrial activity and expansion, lasting with short interruptions until the panic in September, 1873. Meanwhile there had occurred "Black Friday," Sept. 24, 1869, caused by the failure of the gold corner attempted by Smith, Gould, Martin & Co. Were there parallelism, then, our Black Friday would come next year and our panic in 1927, five years hence. The computation is made, of course, merely to furnish the necessary perspective.

After the Civil War pig iron and bar iron first suffered a sharp but quite moderate liquidation in price and then held rather steady for years. In 1867, corresponding to last year, there was a moderate decline in pig iron and a slight decline in bar iron, while in 1868 pig iron recovered part way, bar iron having little occasion to recover. Prices continued to recede slightly, in a general way, until the obviously foolish price boom of 1872, which would correspond to 1926, when in a few months prices reached their greatest height since the war, and then started on a long and great decline.

After the Civil War there was no 1919-20 boom in prices. Things were taken more moderately. There can be no doubt that one great difference between conditions then and now is that then men were willing to work hard, and did work hard, while in this recent period men have been unwill-

ing to work hard, but have expected great rewards.

There was what is commonly called an "unfavorable" trade balance during the Civil War and afterward, until 1876. In the active times there was an "unfavorable balance," while in the "hard times" that followed the panic of 1873, the "unfavorable" balance gradually turned into a "favorable" balance. We were selling securities to foreign investors in the period after the Civil War. An "unfavorable" trade balance now would correspond to our permitting our foreign debtors to pay us.

In the panic of 1873 one naturally expects to find information as to what, if anything, was wrong with the eight or nine years of trade activity that followed the Civil War. The panic showed that too much business had been done on paper for the currency system then existing to take care of. We do not have the same danger now on account of our new system. There was much evidence that there had been undue investment in construction work which could not continuously earn its keep, in railroads in particular, and in plants erected to provide railroad materials. The trouble was not that the unit costs had been too great; there was merely a case of endeavoring to develop the country too rapidly. The condition of late has been quite different. Construction costs have been higher than they should be, and if we have an excess of facilities in any quarter, it is the creation of the war period, not of the post-war period.

Impact and Fatigue Testing

Stimulus was given to further work in at least two testing fields by last week's convention of the American Society for Testing Materials. The symposium on impact testing of materials was an impressive review of accomplishment, and the new contributions to the recently published data on the fatigue of metals were of much significance.

While impact testing as applied to steel is older and in more extensive use than fatigue testing, there is a crying need of standardization of machines, methods and test pieces and of more knowledge of the entire subject. The contributions, besides affording valuable data on past progress and the present status of the art, clearly indicated inconsistencies and the need of further study. Impact tests uniformly carried out are necessary in determining properties of metals not possible of detection by other tests. Doubtless the Testing Society, as a result of this year's meeting, will bring order out of the conflicting data.

The remarkable work on the fatigue of steel by Professor Moore and his colleagues at the University of Illinois, in collaboration with the National Research Council and other organizations, was given added distinction by the results published last week. It had been shown previously that among other things cracks and re-entrant angles in the surfaces of steel, due perhaps to machining, are important factors in fatigue failure. It is now fairly well demonstrated that steel possesses a well-defined "endurance limit" below which it can withstand hundreds of millions of reversals of stress and that it possibly can withstand an indefinitely larger number of such reversals. The arresting statement is made that static tension tests of specimens which have withstood 100,000,000 reversals of stress, close to the endurance limit, have given higher values for tensile strength than before the repeated stressing; and the question is raised whether a metal actually can be benefited by repeated stressing below the endurance limit. The serious drawback to this valuable work, however, is the time required to make such tests. The need of a rapid fatigue test was emphasized and is apparent.

Impact and fatigue testing ultimately can be made valuable commercially, but a vast amount of work is yet to be done. Not only is standardization necessary, but a correlation of the results, particularly the impact with static and other properties, is a *sine qua non* of future progress. Metallurgists and testing engineers are co-operating and the desired result is only a question of time.

Business Memories

Judged by what some business men say, their memories are rather short, particularly when they speak of the prices of the commodities they buy and sell. A buyer insists that a certain price is unreasonably high, while a few months later he not only is quite willing to pay it, but is disposed to pay a premium to secure an early delivery. A seller explains that a certain price is his cost, and points out that one cannot possibly expect him to sell at cost, but in a short time he sells eagerly at a still lower figure.

When, in a period of depression, an observer predicts that better times are coming, his prediction is taken lightly, and he may even be called "an irrepressible optimist" or some other opprobrious epithet. When times are "good," one who predicts less good times coming is considered a "calamity howler." In the abstract, the existence of the business cycle is admitted, but there is objection to taking it in the concrete and assigning the present a particular place in the cycle. When, in the progress of the business cycle, prices are going up, we generally find sellers and buyers co-operating to put them up farther. When they are declining there is similar co-operation.

This apparent shortness of memory is a part of human nature. When times are good men do not wish to remember that they are ever bad. When times are bad courage is at a low ebb and men are afraid to act upon the principle that bad times must be followed by good times.

The business cycle has been studied with particular care in recent years, and fond hopes have been entertained that such study will tend to reduce the amplitude of the swings in the cycle. More than study, however, is necessary. There must be a change in the mind, in its acquiring more willingness to be guided by study and in shaking off some of the tendency to be guided by the present; in other words, by what other men are doing.

An example of this shortness, or apparent shortness, of men's memories is present to-day. There is in most lines of trade a degree of activ-

ity greater than that which a year ago would have been entirely satisfactory to the members of those trades. Whether they then were setting their desires too low or are now wanting too much is no point in the argument. The difference in mental attitude is obvious. Thorough consideration should be given, therefore, to those who are now urging that sellers do not press their present price advantage too far, thus drawing the line indicating the cycle so far above the mean as to cause it sooner to descend below the mean.

CORRESPONDENCE

Standardization of Pulley Sizes

To the Editor: In connection with Mr. Hoover's plan of simplification in industry which means the elimination of commercially nonessential types, sizes and styles, I understand that some of the pulley manufacturers have indicated that pulleys might be simplified with advantage. We have had some correspondence with the fabricated production department of the Chamber of Commerce of the United States on this subject and they seem surprised to know that back in 1919 the Electric Power Club adopted specific pulley sizes as the recommended practice for use with each different size and speed of motor. This information is given in the Electric Power Club Handbook.

There was some little misunderstanding due to the fact that our handbook specified belt width instead of pulley width but at the annual meeting of the club at the beginning of this month it was decided to add another column giving the pulley width in addition to the belt width so that there should be no misunderstanding in future.

I am calling this matter to your attention because if the pulley sizes as adopted by the Electric Power Club were universally recognized, it would tend to standardize the different pulleys on the many machines which are sold for belt drive. As it is now, most of these machine manufacturers seem to pick a pulley size out of the air, so to speak, and when the purchaser comes to buy the motor to drive the machine, he has to order a special pulley in order to get the speed he wants out of the driven machine. This is one of the principal reasons why pulley manufacturers think there is no such a thing as standard pulley sizes for motors. This is a subject which I know would interest the readers of your paper and I hope you will help the good work along by giving some publicity to the pulley standardization which has been effected by the Electric Power Club and by pointing out to your readers the advantage of specifying these standard size pulleys when they buy electric motors.

Referring to our handbook, you will find the standard shaft extension sizes and pulley dimensions on pages 107, 108, and 114 for fractional horsepower motors and pages 126, 127, 137, 138, 150, and 151 for large power motors.

You will note that no pulley bore, shaft extension diameter, or key dimensions are given for the 100-hp. motor at 1150 to 1200 r.p.m. or the 75-hp. motor at 850 to 900 r.p.m. These dimensions were agreed upon at the annual meeting June 6, 1922, and are as follows:

Pulley bore and shaft extension diameter, 3⅝ in.

Key dimensions, ¾ in. wide and ½ in. thick.

It was also decided at the same meeting that the dimensions in the new column which is to be added under the heading of "pulley widths" would be obtained as follows:

½ in. shall be added to the present belt widths of 2 to 5 in., inclusive.

¾ in. shall be added to the present belt widths of 6 in. to 7 in., inclusive.

1 in. shall be added to the present belt widths of 10 in. to 14 in., inclusive.

I hope you agree with me on the importance of this subject of pulley standardization and if you publish anything regarding the standardization which has been accomplished by the Electric Power Club, will you please state that the Electric Power Club is an association consisting of the manufacturers which make over 95 per cent of the electric power apparatus and control equipment manufactured in this country. I ask you to make some such statement as this regarding the Electric Power Club because its name is such that most people think it is connected with the National Electric Light Association or with the central stations in the country.

Although the fourteenth edition of the Electric Power Club Handbook is dated March, 1922, it was not actually issued until this month. It is about one-third larger than the preceding edition and all the new material in this edition is dated later than August, 1920. The handbook itself is a standard of measurement, which every buyer of electric power and control apparatus should use. You will note that some of the sections, notably, the industrial control section and the power switchboard and switching equipment section have not only established manufacturing standards but have also compiled specifications for use of the purchaser in buying such equipment.

S. N. CLARKSON,
Executive Secretary.
St. Louis, June 29. ELECTRIC POWER CLUB.

BOOK REVIEWS

Foundrymen's Handbook. — Penton Publishing Co., Cleveland. Pages 309. 6 x 9 in. Price $5.

For some years the *Foundry* has been issuing data sheets of interest to foundrymen and engineers connected with foundry establishments. These sheets have now been collected, divided into proper groups and elaborately indexed. The data themselves have been compiled by competent men and can be regarded correct, so far as "tables" for an advancing industry may be constructed.

The first section embraces general foundry data of a very miscellaneous character, which will doubtless be sub-divided and increased in a subsequent edition. More might well have been given concerning cupola operation. The second section, on computing weights, is quite complete and will be found very useful by the engineering staff connected with active, pushing concerns. The patternmaker is particularly interested in section three, which gives him about thirty pages of data. This should be extended in later editions.

The non-ferrous metals and alloys are ably handled in section four. A profusion of information is gathered here, which will be much appreciated by the brass founder. Some of the foundry specifications in current use follow in section five; and a few tables of miscellaneous character comprise the last section. The index is noteworthy in its completeness and cross reference.

The volume, which is substantially gotten up, is a good fore-runner of the handbook the foundry industry is looking for. It will be well received by the foundry and prove its usefulness time and again. Eventually there should be a well considered grouping of the information presented, with good editorial connecting up, so that instead of merely looking up a table, the foundryman may be briefly informed on the general subject involved, and how the table was constructed. It will then be possible to crowd much more information into a handier volume of thin paper, on the model of Marks' "Mechanical Engineers' Handbook."

Handbook on Controllers for Electric Motors, a 32-page handbook, 4 x 6¾ in., has been issued by the Electric Power Club, 1017 Olive Street, St. Louis, for the information of those using controllers. Words which do not appear in regular dictionaries are herewith explained in simple language, together with instructions for the care and handling of the apparatus.

JUNE PIG IRON OUTPUT

A Gain of 4292 Tons Per Day Over May

Seventeen Furnaces Blown In, Two Out

Despite the coal strike and for the third month in succession, data of the country's pig iron output collected largely by telegraph, show a large gain in June over May. The gain per day in June was 4,292 tons over the rate per day in April. While this is not as large as the gain of 5,339 tons per day in May over April it is larger than the gain of 3,395 tons per day in April over March. A significant feature of the June output is the fact that the merchant iron production showed a larger gain than the steel-making iron output which is the first time that this has occurred in many months.

The production of coke and anthracite pig iron for the 30 days in May amounted to 2,361,028 gross tons or 78,701 tons per day as compared with 2,306,679 tons or 74,409 tons per day in May, a 31-day month. The June increase over May was 54,349 tons. Last year the June output was 1,064,833 tons. Although the June output this year is still less than that of January, 1921, the daily rate is larger, but does not yet equal any record made in 1920.

The total number of furnaces in blast on July 1 was 192 as compared with 175 on June 1, with 162 on May 1 and with only 69 on Aug. 1, 1921, the low point in last year's depression. The capacity of the 192 furnaces in blast on July 1 is estimated at 81,845 tons per day as compared with 77,520 tons per day for the 175 furnaces in blast on June 1. There were 19 furnaces blown in in June and only 2 blown out or banked, a net gain of 17 furnaces. In May the net gain was 13 furnaces with 21 blown in and 8 blown out. These gains compare with 7 in April, 17 in March and 12 in February.

The manganese-iron alloy output of 23,090 tons in June was the largest since April, 1921. Of this total 18,273 tons was ferromanganese and 4,817 tons was spiegeleisen.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from June, 1921, is as follows:

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works	Merchant	Total
June, 1921	29,444	6,050	35,494
July	23,086	4,803	27,889
August	26,037	4,743	30,780
September	27,189	5,661	32,850
October	33,365	6,850	40,215
November	37,960	9,223	47,183
December	41,173	12,023	53,196
January, 1922	42,130	10,933	53,063
February	46,827	11,387	58,214
March	53,547	12,128	65,675
April	56,930	12,140	69,070
May	60,619	13,790	74,409
June	62,534	16,167	78,701

The figures for daily average production, beginning with January, 1916, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1916—Gross Tons

	1916	1917	1918	1919	1920	1921	1922
Jan.	102,746	101,643	77,799	106,525	97,264	77,945	53,063
Feb.	106,456	94,473	82,835	105,006	102,720	69,187	58,214
Mar.	107,667	104,882	103,648	99,685	108,900	51,468	65,675
Apr.	107,592	111,165	109,607	82,607	91,327	39,768	69,070
May	108,422	110,238	111,175	68,002	96,312	39,394	74,409
June	107,053	109,002	110,793	70,495	101,451	35,494	78,701
July	104,017	107,820	110,354	78,340	98,931	27,889	.....
Aug.	103,346	104,772	109,341	88,496	101,529	30,780	.....
Sept.	106,745	104,465	113,942	82,932	104,310	32,850	.....
Oct.	113,189	106,550	112,482	60,115	106,212	40,215	.....
Nov.	110,394	106,859	111,802	79,745	97,830	47,183	.....
Dec.	102,537	92,997	110,762	84,944	87,222	53,196	.....

Among the furnaces blown in during June were the following: Buffalo A furnace and Harriet Y furnace in the Buffalo district; the Robesonia furnace in the Lebanon Valley; No. 2 Isabella furnace of the Carnegie Steel Co., and one Monessen furnace of the Pittsburgh Steel Co. in the Pittsburgh district; No. 1 Newcastle furnace and No. 1 Farrell furnace of the Carnegie Steel Co. in the Shenango Valley; the Norton furnace in Kentucky; the Tod furnace of the Brier Hill Steel Co., No. 3 furnace of the Republic Iron and Steel Co. and the Mary furnace in the Mahoning Valley; No. 4 furnace of the National Tube Co. and one River furnace in northern Ohio; the Milton furnace in southern Ohio; No. 2 South Chicago (old) furnace of the Illinois Steel Co. in Illinois; the Zenith furnace in Minnesota; the Philadelphia furnace of the Sloss-Sheffield Steel & Iron Co. in Alabama and the LaFollette furnace in Tennessee.

Among the furnaces blown out during June were the following: One Shenango furnace in the Shenango Valley and one Johnstown furnace of the Cambria Steel Co. in western Pennsylvania.

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces for June and the three months preceding:

Pig Iron Production by Districts, Gross Tons

	June (30 days)	May (31 days)	April (30 days)	March (31 days)
New York	148,115	150,141	131,093	124,584
New Jersey	10,725	5,636	4,815	4,199
Lehigh Valley	66,967	66,572	45,714	32,142
Schuylkill Valley	60,925	66,669	58,927	56,893
Lower Susquehanna and Lebanon Valleys	26,501	21,313	17,387	19,948
Pittsburgh district	485,401	479,106	473,584	479,433
Shenango Valley	87,156	79,145	63,940	59,901
Western Penna.	91,494	103,072	106,430	98,502
Maryland, Virginia and Kentucky	54,687	47,862	26,463	24,172
Wheeling district	74,710	66,148	54,450	80,819
Mahoning Valley	240,470	227,053	197,113	207,892
Central and Northern Ohio	236,374	218,547	197,595	226,765
Southern Ohio	30,272	29,311	27,165	35,333
Illinois and Indiana	454,937	459,631	427,427	362,129
Mich., Minn., Mo., Wis. and Colo.	93,723	89,147	67,360	64,665
Alabama	189,101	196,104	171,823	157,441
Tennessee	9,470	1,222	828	1,102
Total	2,361,028	2,306,679	2,072,114	2,035,920

Capacities in Blast July 1

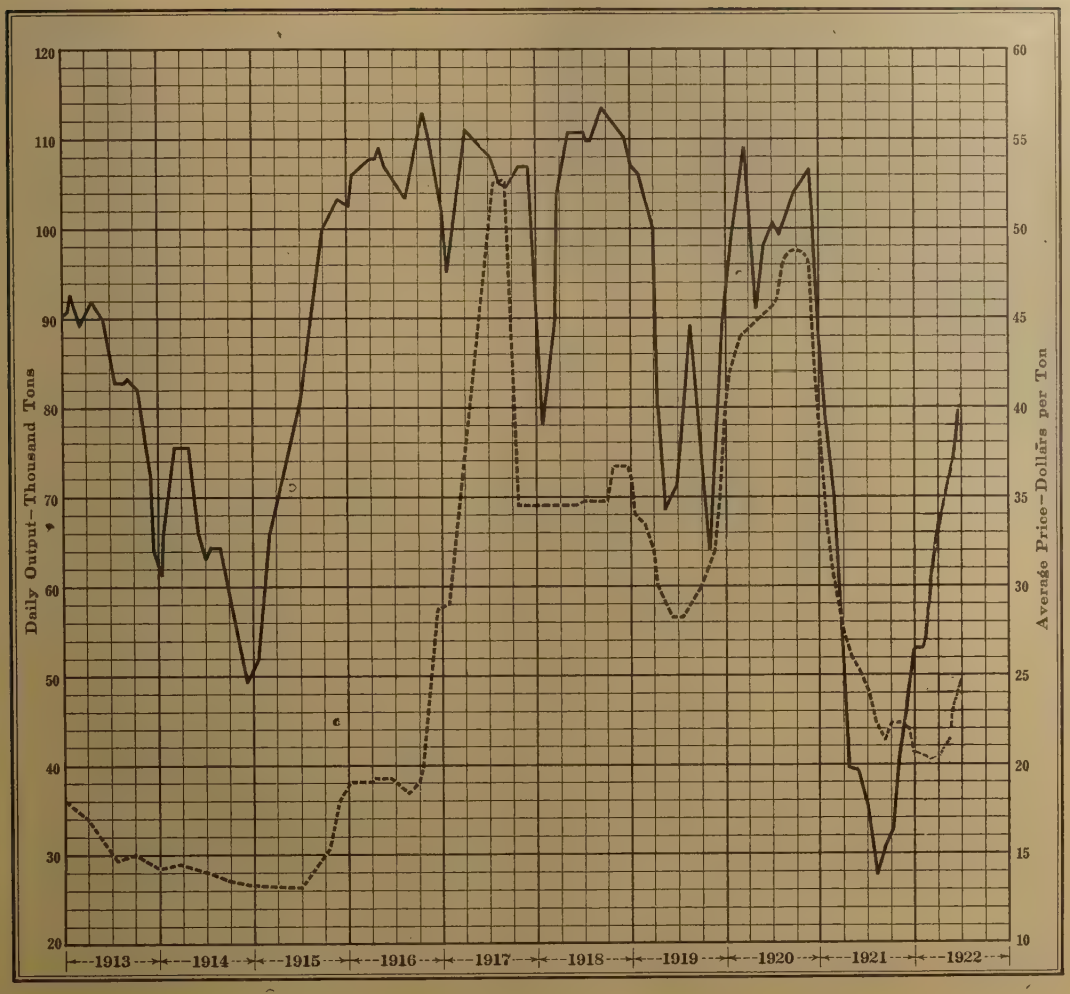
The following table shows the number of furnaces in blast July 1 in the different districts and their capacity, also the number and daily capacity in gross tons of furnaces in blast June 1:

Coke and Anthracite Furnaces in Blast

Location of Furnaces	Total Stacks	July 1 In Blast	July 1 Capacity per Day	June 1 In Blast	June 1 Capacity per Day
New York:					
Buffalo	22	13	5,400	11	4,840
Other New York	4	0	.....	0	.....
New Jersey	4	1	355	1	400
Pennsylvania:					
Lehigh Valley	18	5	2,070	5	2,000
Spiegel	2	1	160	1	170
Schuylkill Valley	15	6	2,030	6	2,150
Lower Susquehanna	10	2	775	2	615
Lebanon Valley	6	1	105	0	.....
Ferro	2	1	70	1	70
Pittsburgh District	55	35	16,300	33	15,215
Ferro and spiegel	4	3	405	3	390
Shenango Valley	19	8	3,300	7	2,825
Western Pennsylvania	26	7	2,870	8	3,325
Maryland	5	3	1,060	3	1,125
Ferro	1	1	130	1	70
Wheeling District	15	5	2,490	5	2,660
Ohio:					
Mahoning Valley	28	18	8,800	15	7,485
Central and Northern	26	17	8,395	15	7,520
Southern	16	3	1,020	2	945
Illinois and Indiana	42	28	15,350	27	15,200
Mich., Wis. and Minn.	11	6	2,300	4	1,660
Colorado and Missouri	6	3	1,170	3	1,215
The South:					
Virginia	16	0	.....	0	.....
Kentucky	7	2	600	1	300
Alabama	41	20	6,340	19	7,040
Tenn., Ga. and Texas	16	3	350	2	300
Total	417	192	81,845	175	77,520

Diagram of Pig Iron Production and Prices

The fluctuations in pig iron production from 1913 to the present time are shown in the accompanying chart. The figures represented by the heavy lines are those of daily average production by months of coke and anthracite iron. The dotted curve on the chart represents monthly average prices of Southern No. 2 foundry pig iron at Cincinnati, local No. 2 foundry iron at furnaces in Chicago, and No. 2X at Philadelphia. They are based on the weekly quotations of THE IRON AGE.



The Full Line Represents the Daily Production of Pig Iron and the Dotted Line Is the Average of the Price Per Ton of No. 2 Southern Pig Iron at Cincinnati, Local No. 2 Iron at Chicago and No. 2X Iron at Philadelphia

Production of Coke and Anthracite Pig Iron in the United States by Months, Beginning Jan. 1, 1918—Gross Tons

	1918	1919	1920	1921	1922
Jan. ...	2,411,768	3,302,260	3,015,181	2,416,292	1,644,951
Feb. ...	2,319,299	2,940,168	2,978,879	1,937,257	1,629,991
Mar. ...	3,213,091	3,090,243	3,375,907	1,595,522	2,035,920
Apr. ...	3,288,211	2,478,218	2,739,797	1,193,041	2,072,114
May ...	3,446,412	2,108,056	2,985,682	1,221,221	2,306,679
June ...	3,323,791	2,114,863	3,043,540	1,064,833	2,361,028
½ year.	18,002,572	16,033,808	18,138,986	9,428,166	12,050,683
July ...	3,420,988	2,428,541	3,067,043	864,555	.....
Aug. ...	3,389,585	2,743,388	3,147,402	954,193	.....
Sept....	3,418,270	2,487,965	3,129,323	985,529	.....
Oct. ...	3,486,941	1,863,558	3,292,597	1,246,676	.....
Nov. ...	3,354,074	2,392,350	2,934,908	1,415,481	.....
Dec. ...	3,433,617	2,633,268	2,703,855	1,649,086	.....
Ttl. yr.	*38,506,047	30,582,878	36,414,114	16,543,686	.....

*These totals do not include charcoal pig iron. The 1921 production of this iron was 94,730 tons.

Production of Steel Companies—Gross Tons

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies, as well as from merchant furnaces producing ferromanganese and spiegeleisen, show the following totals of steel making iron, month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons

	Total Production			Spiegeleisen and Ferromanganese		
	1920	1921	1922	1920	1921	1922
Jan.	2,232,455	1,932,159	1,306,045	23,957	22,228	6,874
Feb.	2,181,679	1,625,695	1,311,170	28,038	29,013	8,540
Mar.	2,480,668	1,323,443	1,629,982	35,275	41,294	13,695
Apr.	1,968,542	1,015,621	1,707,902	27,628	24,310	19,209
May	2,128,720	1,024,678	1,879,180	33,407	9,232	20,334
June	2,209,770	883,312	1,876,033	34,751	4,536	23,090
July	2,230,567	715,664	.....	36,739	5,524	.....
Aug.	2,254,943	807,144	.....	36,985	3,878	.....
Sept.	2,247,250	815,692	.....	39,546	3,289	.....
Oct.	2,393,644	1,034,312	.....	34,786	3,902	.....
Nov.	2,150,075	1,138,789	.....	26,944	3,525	.....
Dec.	2,047,167	1,276,381	.....	28,023	3,953	.....

Coal Conference in Deadlock

WASHINGTON, July 3.—Adjournment of the bituminous coal conference until next Monday has left for speculation only the result of efforts made, through the offices of the Government, to settle the strike. To all outward signs the operators and miners are deadlocked, the former refusing to accept the suggestion of the miners that a settlement be based upon National agreements, while the miners appear to be strongly opposed to the operators' suggestion that it be based upon district agreements. This has led to reports that one side might find a convenient way out of yielding to the other by accepting a plan proposed by the Government, even if it is not in accordance with the principle that side favors. That a plan for unconditional arbitration at the hands of a Government body has been or will be accepted by both sides has also been reported, but nothing of an official character supported such a report.

Still another report has it that the operators have determined that, before they will yield to the demands of the miners, they will open well-located properties now in union fields and resume operations at an early date as non-union mines prepared to combat any trouble that may develop.

British Iron and Steel Market

Pig Iron Again Shipped to United States—Steel, Prices Sagging—Tin Plate Active—Continental Prices Unchanged

(*By Cable*)

LONDON, ENGLAND, July 3.

Pig iron presents no fresh feature, but the freight question is now arranged. Shipment of 2000 tons of Cleveland pig iron from Middlesbrough to Baltimore and 2500 tons to New Orleans is being made. The boats are now loading. There is still some American inquiry for foundry iron, but nothing has been done.

Hematite has an easy tendency. There is some inquiry from Germany. There has been good recent buying of ferromanganese for America and there still is some demand.

Steel shows a little more home inquiry and trade is getting better by degrees, but the export market is dull. The works are inclined to cut prices for desirable specifications.

Tin plate has a good market, with general buying, especially by Portugal, Italy and France. The pooling scheme, including all of the South Wales mills, has been approved and comes into force immediately. The market is firmer, in consequence. A big oil-size inquiry for the Far East probably will be placed here shortly. The mills are running now at about 90 per cent of capacity.

Japanese specifications for black sheets are in request, but galvanized sheets are dull and have an easy tendency.

The Newport Monmouthshire Corporation is in the market for 22,000 tons of cast iron pipe.

Clyde shipbuilding output of the past six months has amounted to 61 vessels, aggregating 167,000 tons, against 118 vessels and 236,000 tons for the first half of last year.

Japanese Government railroads have bought 34 electric locomotives from the English Electric Co., Ltd., London.

We quote per gross ton, except where otherwise stated, f.o.b. maker's works, with American equivalent figured at $4.42 per £1, as follows:

Durham coke, delivered	£1	7s.			$5.97	
Cleveland No. 1 foundry	4	15			21.00	
Cleveland No. 3 foundry	4	10			19.89	
Cleveland No. 4 foundry	4	7½			19.34	
Cleveland No. 4 forge	4	5			18.79	
Cleveland basic	4	10			19.89	
East Coast mixed	4	14	& £4	13s.*	20.77 &	20.55*
Ferromanganese	15	0			66.30	
Ferromanganese*	14	10	to 14	15	64.09 to	65.20
Rails, 60 lb. and up	7	17½	to 9	10	34.81 to	41.99
Billets	7	0	to 8	0	30.94 to	35.36
Sheet and tin plate bars, Welsh	7	7½			32.60	
Tin plates, base box	0	19½	to 0	20	4.31 to	4.42
					C. per Lb.	
Ship plates	9	0	to 10	0	1.78 to	1.97
Boiler plates	13	0	to 14	0	2.57 to	2.76
Tees	9	5	to 10	10	1.83 to	2.07
Channels	8	10	to 9	15	1.68 to	1.93
Beams	8	5	to 10	0	1.63 to	1.97
Round bars, ¾ to 3 in.	9	5	to 10	0	1.83 to	1.97
Galvanized sheets, 24 g.	15	12½	to 15	15	3.08 to	3.11
Black sheets	12	0			2.37	
Steel hoops	12	0	& 12	5*	2.37 &	2.42*
Cold rolled steel strip, 20 g.	23	2½			4.56	
Cotton ties, Indian specifications	15	0			2.96	

*Export price.

Continental Prices, All F.O.B. Channel Ports, Delivery as Specified

No. 3 foundry pig iron:						
Belgium, July	£4	12½s.	to £4	15s.	$20.45 to	$21.00
Luxemburg, July	4	12½	to 4	15	20.45 to	21.00
France, July	4	12½	to 4	15	20.45 to	21.00
Basic pig iron:						
Luxemburg, July	4	6	to 4	7	19.01 to	19.23
Billets:						
Luxemburg, July	6	5			27.63	
Lorraine, July	6	5			27.63	
Wire nails (keg basis):						
Germany, August	0	14½			3.20	
Wire rods, 5 mm. (0.2 in.):						
Belgium, July	7	5			32.05	
Angles:					C. per Lb.	
Belgium, July	7	10	to 7	12½	1.48 to	1.50
Tees						
Belgium, July	8	5			1.63	
Channels:						
Belgium, July	7	10	to 7	12½	1.48 to	1.50
Merchant bars:						
Belgium, July	7	13½	to 8	0	1.54 to	1.58
Luxemb'g, July, Aug.	8	0			1.58	
Germany, July, Aug.	8	0	to 8	7½	1.58 to	1.65
France, July	8	5	to 8	10	1.63 to	1.68
Joists (beams):						
France, July, Aug.	7	7½	to 8	0	1.46 to	1.58
Belgium, July, Aug.	7	7½	to 7	10	1.46 to	1.48
Luxemburg, July	7	15	to 8	0	1.53 to	1.58
Belgium, July	8	2½			1.60	
⅜-in. plates:						
Germany, July, Aug.	9	5			1.83	
Belgium, July	8	0	to 8	2½	1.58 to	1.60
Luxemburg	8	10			1.68	
⅛-in. plates:						
Germany	9	0			1.78	
No. 8 gage wire:						
Belgium, July, Aug.	14	10			2.86	

JAPAN STILL BUYING RAILS

Municipalities and Private Railroads Inquire—China Buys Copper—Germany Seeks Scrap

NEW YORK, July 3.—Japan continues to show an increasing interest in purchasing black sheets of light gage. Most exporters to Japan are now handling inquiries totaling 50 or 75 tons up to 1000 or 1500 tons. As a comparison of British and American quotations on black sheets delivered to Japanese ports, an exporter in New York recently obtained a quotation on three inquiries of 70 tons, 50 tons and 30 tons of light gage sheets of $84.70 per ton, c.i.f. Yokohama from an American seller and £16 18s, c. and f. Yokohama (at exchange then prevailing $75.95) from a British seller. Adding 1 per cent to cover insurance on the British shipment their price was about $76.70 per ton, c.i.f. Japan. This difference in price might be discounted somewhat by the fact that the British sheets probably were not one pass cold rolled.

Activity in purchases of rails of all weights, both from Governmental and private sources in Japan, is heavy. One Japanese export house, which has shipped three miles of 30-lb. rails to the Division of Forestry of the Formosan Government is quoting on an additional three miles. A Japanese municipality is asking for prices on about 1500 tons of 82-lb. and 127-lb. grooved rails, Lorain type, and there is an inquiry for 2000 tons of 45-lb. and 60-lb. rails from a privately owned railroad. As a comparison of German and American prices on light rails at present, on a recent inquiry for 12-lb. sections, $45.25 per ton, c.i.f. Yokohama, August-September delivery, was quoted by a German mill against $48.95 per ton, four weeks delivery by an American seller.

The most important railroad construction project planned by the Imperial Government Railways during the coming year, according to the *Trans-Pacific* is the building of the submarine tunnel under Shimonoseki Strait to Kyushu. Another important project is the electrification of the Tokio-Yokohama-Odawara lines and several other suburban lines around Tokio. A freight line is to be built within the year from Sumidagawa freight station to Echujima and the Minister of Railways has granted a charter to the Jomo Electric Tramway Co., to construct a tramway from Mayebashi to Takasaki.

The Chinese market is quiet but still eager to purchase wire shorts. One New York exporter after great difficulty obtained sufficient wire shorts in small lots to fill orders from China totaling 300 tons. There is some interest also in second hand material. There is some copper buying, an inquiry from Shanghai calling for 1000 tons of casting copper, said to be for minting. A small inquiry for grooved rails is being bid upon. The South Manchuria Railway Co. is asking for prices on about 25 tons of soft steel bars.

German copper purchases are still heavy; one buying agent in New York purchased a total of almost 1000 tons last month and may run up to 1500 tons next month. The great majority of these purchases

are in small lots of 75-lb. wire rods with pointed ends. While much of it is being used in Germany some is being re-exported to other European countries.

That Germany would purchase heavily of steel scrap in the United States if sufficiently low prices could be obtained is probable, but thus far no sales are reported to have been made. There is a rumor, however, that a shipment of 19,000 tons of heavy melting steel has been made, which was purchased at $10 per ton, f.a.s. New York. Scrap dealers in this district express considerable doubt that even a low grade of heavy melting steel could have been obtained at this price and point out that the buying office of one German interest has recently offered up to $12 per ton, f.a.s. New York, unsuccessfully. The general scrap shortage throughout Europe is shown in a recent Italian inquiry offering $14 per ton, c.i.f. Italian port.

Belgian pig iron production in April registered a decline from the previous month's figures, being only 113,820 metric tons. The steel ingot production was 90,870 metric tons. The Australian metal industries continue in a difficult situation, says a report of an American trade commissioner. Employers state that the 44-hr. week for 48-hr. pay has crippled the industry, and employees refuse to consent to any reduction in wages or increase in hours of work. The Australian pig iron production which increased from 209,253 tons in 1918 to 352,365 tons in 1921, has practically ceased, because of offerings of pig iron and steel products from overseas at prices with which Australian producers cannot compete.

Brazil Centennial Exposition

The two buildings, which will house the exhibits from the United States at the Brazil Centennial Exposition, Sept. 7, 1922, to March 31, 1923, will cost the United States Government about $1,000,000 and will house exhibits and missions from 29 States and a number of the larger cities, according to Davies, Turner & Co., 29 Pearl Street, New York.

FRENCH PRODUCTION ACTIVE

Buying Dropping Off, But International Competition Not So Severe

PARIS, FRANCE, June 20.

The situation of the French iron and steel market has been improving since the early part of May. This improvement was due partly to a seasonal revival of the structural trades and also to some demands from Germany in semi-finished products and rolled merchant products, but it never assumed large proportions and it seems already to have come to a standstill, after having, however, brought to the producers orders for some months to come. Its influence on prices was very slight, and foundry pig-iron sells even lower now than it did six weeks ago. Of course, so large is the present iron production capacity of France that nothing but the so much hoped for general world revival of trade will put things right again. Meanwhile, the large Lorraine concerns are losing money, as was shown by the report recently submitted to the general meeting of the Knutange iron works.

For the time being, the rise of German prices has lessened the pressure of German iron products on export markets and has permitted Lorraine iron works, such as Knutange, Rombas, Hagondange, etc., to obtain some orders at very low prices, on which they will indeed probably sustain a loss but which will enable them to increase their production. Austrian construction works, for instance, which could not satisfactorily procure pig iron from western Germany, purchased it in the Saar and Lorraine districts.

Iron Ore.—The French production of iron ore in April was 1,379,721 tons, against 1,553,900 tons in March and a pre-war monthly average output of 3,582,000 tons. Stocks, which amounted to 3,911,000 tons at the end of March, have since notably decreased. During the first quarter of 1922, French exports of iron ore totalled 2,104,000 tons (of this 616,000 tons to Germany and 316,000 tons to Belgium).

Pig Iron.—The production of basic pig iron for steelworks is increasing, owing to large orders for semi-finished steel. As regards foundry pig iron, the demand is not important and small stocks exist at blast furnaces. The tendency is rather to restrict the production than to increase it. The current price for chill-cast foundry pig-iron, No. 3 P. L., is 215 to 220 frs., but the price of 210 frs. ($17.85 per metric ton) has been done.

Belgian foundry pig-iron is now worth 230 to 235 frs. (Belgian currency), or 216 to 220 frs. (French currency). Lorraine foundry pig-iron for export is now approximately 235 frs. (French currency) f. o. b. Antwerp. Cleveland pig-iron, No. 3 G. M. B. is now worth 109s c.i.f. Antwerp, or 340 frs. (French currency) at the Franco-Belgian frontier, which, of course, hardly gives it a chance to compete with French pig-iron on inland markets.

Inquiry for hematite pig-iron is very quiet. British competition, notwithstanding the rise of the pound sterling, is still to be reckoned with. An actual offer of British hematite at 315 frs. c.i.f., Havre, is reported. Orders were booked by French producers at 305 to 315 frs. in the East; 295 to 305 frs. in the Northern and Western coast areas (where British hematite most easily penetrates), and 325 to 330 frs. in the Central and Parisian areas.

Semi-finished Steel.—Prices are firm, and producers are well supplied with orders. Last published prices per metric ton for mild steel products are:

	Domestic	Export	Export equivalent
Blooms	320 to 325 fr.	310 to 320 fr.	$26.35 to $27.20
Billets	340 to 350	320 to 330	27.20 to 28.05
Flat bars	350 to 370	350 to 355	29.75 to 30.20

Beams.—The market is moderately active. The base price is 475 frs. (1.80c. per lb.), equivalent to an average of 420 to 430 frs. at producing works.

Rails.—French railroad companies are now preparing extensive orders for rails which they will allocate shortly. The base price is 540 to 550 frs. ($45.90 to $46.75) per ton delivered.

Sheets and Plates.—The home market for sheets is now much better, and the rise of both the British pound and the Belgian franc has tended to check foreign competition. Small orders for plates have been given by French private shipbuilding yards, but the trade is still eagerly awaiting the orders relative to the carrying out of the new French naval program, which were delayed by extensive tests on plates intended for the new large submarines. Base prices of the Comptoir des Toles et Larges Plats are:

Thick sheets	640 frs. (2.40c. per lb.)
Medium sheets	720 frs. (2.78c. per lb.)
Thin Sheets	900 frs. (3.48c. per lb.)

These are for mild steel products, delivered at an averaged distance French consuming center.

Rolled Merchant Products.—The demand has calmed down. However, in May and early June producers booked orders that will carry them into the fall. The current price is 420 to 430 frs. (1.62c. to 1.66c. per lb.), at producers works.

Steel Wire.—The market is moderately active. The current price is 460 to 480 frs. (1.77c. to 1.86c. per lb.), at producers works.

Coke.—The adjusted price of coke to be supplied to French blast-furnaces has been increased from 90 frs. ($7.65 a ton) for June, to 93 frs. ($7.90) for July, at the Franco-German frontier. This is due to a rise of the German home price. French production of coke from collieries' ovens is now at the rate of only 800,000 tons per annum, while it was over 2,500,000 tons before the war.

Pourparlers are now going on between the Italian and French iron and steel trades with a view of entering into an greement for safeguarding the existence of Italian ironworks and avoiding a tariff strife between the nations. French representatives seem quite ready to fall in with the views of their Italian colleagues, provided they be granted the possibility of exporting to Italy some raw products and semi-finished material of such specifications, however, as Italy does not produce herself.

Iron and Steel Markets

NEW UNCERTAINTIES

Fuel Situation Confused—Large Pig Iron Gain in June

Pressure on the Mills Keeps Up—New Chicago Business in Large Volume

The events of the week have brought new uncertainties into the situation, after a month in which output of pig iron and steel were at the highest rate since December, 1920. Hopes of a settlement of the coal strike have not been raised by the first contacts at Washington, and the strike of railroad shop employees temporarily strengthens the will of the miners to remain out. Western Pennsylvania coal loadings showed no increase last week, and meanwhile holiday absences of workers have reduced production.

In the Pittsburgh district a good many rolling mills suspended operations from Saturday to Wednesday, thus adding to the arrearages on their order books.

The June pig iron figures bear out all that was said in that month of the gains being made at blast furnaces. For the 30 days output was 2,361,028 tons, or 78,701 tons per day, against 2,306,679 tons in the 31 days of May, or 74,409 tons per day. The Steel Corporation added five furnaces to its active list in June, the independent steel companies seven and the merchant pig iron producers five. The capacity of the 192 furnaces active on July 1 was 81,845 tons per day, against 77,520 tons per day for 175 furnaces on June 1.

Pig iron production is now at the rate of nearly 30,000,000 tons per year, which is between the rate of December, 1920, and that of January, 1921.

Producers are not attempting to predict the effect of the railroad strike upon transportation. Some slight congestion is reported and the interruption of raw and finished material movement is recognized as a possible factor.

Both coal and coke prices are higher in view of this week's holiday. Little furnace coke can be had at less than $8.50, and $9 has been paid. In the Pittsburgh district the minimum for coal is $4, and Southern coal has advanced 50 cents to $3.75 at mine.

The effect of coal shortage on the operations of consumers of iron and steel is having more consideration. Producers are better provided for than are those who buy from them. Thus far, however, there has been no lessening of the pressure upon steel mills for early deliveries.

Chicago mills in particular have felt this urging. For a large company there last week was one of the heaviest of the year in new business booked.

Greater variations appear in prices of plates, shapes and bars, especially for July and August delivery, in view of advances made by certain independent companies and the course of the Steel Corporation in holding back.

Further sheet bar sales are reported at $35 in the Central West, while the Steel Corporation's third quarter price is $33. On wire rods $40 is the general market, but the leading producer's price is $38.

With 5000 more freight cars bought in the week, the total of nearly 100,000 since January 1 shows a good margin over the six months average of the ten years before the war. It represents a rate of buying nearly three times that of the last five years.

Rail mills have been kept busy, particularly in the West. The Algoma mill at Sault Ste. Marie has a 48,000-ton order from the Canadian Pacific.

Structural steel lettings totaling 24,000 tons for the larger projects and new inquiries for 11,000 tons show no noticeable let up in fabricated steel activity.

Iron puddlers will receive $8.53 per ton in July and August as the result of the bi-monthly wage settlement of last week, an advance of 90 cents. The average price of bar iron in the April 20-June 20 period was 1.604c.

With costs of pig iron rapidly advancing, due principally to high coke, prices are tending upward and at Chicago have advanced 50c. on foundry, malleable and basic grades, while Southern iron has also been marked up at least 50c. The importing of moderate tonnages of foreign iron and contracts for additional amounts are acting as a check on the market. In steel making irons, inquiries in the Pittsburgh district include 7000 tons of basic and 1500 tons of Bessemer. In Philadelphia, a Steel Corporation subsidiary has purchased 10,000 tons of basic. With the reduced freight rates, Southern iron promises to be a more important factor in the Northern market.

The iron ore movement down the Lakes is heavy, June shipments amounting to 6,629,000 tons, or 3,000,000 tons more than in June, 1921. Some large orders for ore are still held back in view of fuel uncertainties.

Pittsburgh

Prices of Independents Inclined to Advance — Steel Corporation Holds Back

PITTSBURGH, July 3.—It is a common thing to hear the present steel situation referred to as a modified repetition of the 1920 condition. Independent company prices in most lines continue to grow stronger, while the Steel Corporation is inclined to hold back. The failure of the Washington coal conference to develop any material change in the attitude of either the operators' or miners' representatives toward settlement terms, coupled with the threat of the transportation difficulties contained in the walkout of the railroad shopmen, has the trade more or less at sea as to what is immediately ahead. Sentiment is not as hopeful as a week ago of an early ending of the coal strike, and there are fears that without the inspection of motive power done in railroad shops, difficulties soon will develop in the movement of materials.

These conditions promote conservatism on the part of the steel mills about further adding to their obligations, except at prices sufficiently high to at least cover costs. This week will result in a further falling behind on the part of the mills in regard to their booking, because outside of the blast furnaces there has been almost complete suspension of operations which began at noon last Saturday and runs over to Wednesday

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	July 3, 1922	June 27, 1922	June 6, 1922	July 5, 1921
No. 2X, Philadelphia†	*$27.64*	$27.82	$26.26	$25.50
No. 2, Valley furnace†	24.00	24.00	24.00	21.00
No. 2, Southern, Cin'ti†	**22.55**	22.50	23.00	25.50
No. 2, Birmingham, Ala.†	**18.50**	18.00	18.50	21.00
No. 2 foundry, Chicago*	**24.00**	23.50	23.00	20.00
Basic, del'd, eastern Pa.	**25.75**	26.00	25.00	23.50
Basic, Valley furnace	25.00	25.00	25.00	20.00
Valley Bessemer, del. P'gh	*26.77*	26.96	26.96	23.46
Malleable, Chicago*	**24.00**	23.50	23.00	20.00
Malleable, Valley	24.50	24.50	24.50	21.50
Gray forge, Pittsburgh	*25.27*	25.46	25.46	21.96
L. S. charcoal, Chicago	*31.65*	32.00	29.00	37.50
Ferromanganese, seaboard	67.50	67.50	67.50	70.00

Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$40.00	$40.00	$40.00	$47.00
Bess. billets, Pittsburgh	35.00	35.00	35.00	33.00
O.-h. billets, Pittsburgh	35.00	35.00	35.00	33.00
O.-h. sheet bars, P'gh	35.00	35.00	35.00	35.00
Forging billets, base, P'gh	40.00	40.00	40.00	38.00
O.-h. billets, Philadelphia	*40.17*	40.74	40.74	38.74
Wire rods, Pittsburgh	40.00	40.00	38.00	45.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	1.70	1.70	1.70	2.00
Light rails at mill	**1.70**	1.60	1.50	2.20

Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	*1.925*	1.96	1.96	2.25
Iron bars, Chicago	**1.80**	1.75	1.70	2.10
Steel bars, Pittsburgh	1.70	1.70	1.70	1.90
Steel bars, Chicago	1.75	1.75	1.75	2.28
Steel bars, New York	*2.04*	2.08	1.98	2.28
Tank plates, Pittsburgh	1.70	1.70	1.60	1.90
Tank plates, Chicago	1.75	1.75	1.75	2.28
Tank plates, New York	*2.04*	2.08	1.98	2.28
Beams, Pittsburgh	1.70	1.70	1.60	2.00
Beams, Chicago	1.75	1.75	1.75	2.38
Beams, New York	*2.04*	2.08	1.98	2.38
Steel hoops, Pittsburgh	**2.50**	2.40	2.40	2.50

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire,	July 3, 1922	June 27, 1922	June 6, 1922	July 5, 1921
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	3.15	3.15	3.15	3.50
Sheets, galv., No. 28, P'gh	4.15	4.15	4.15	4.50
Sheets, blue an'l'd, 9 & 10	2.40	2.40	2.40	2.65
Wire nails, Pittsburgh	2.40	2.40	2.40	3.00
Plain wire, Pittsburgh	2.25	2.25	2.25	2.75
Barbed wire, galv., P'gh	3.05	3.05	3.05	3.65
Tin plate, 100-lb. box, P'gh	$4.75	$4.75	$4.75	$5.75

Old Material, Per Gross Ton:				
Carwheels, Chicago	**$18.50**	$18.25	$18.25	$13.25
Carwheels, Philadelphia	17.50	17.50	17.00	18.00
Heavy steel scrap, P'gh	**17.50**	17.00	17.00	12.00
Heavy steel scrap, Phila.	15.00	15.00	15.00	11.00
Heavy steel scrap, Ch'go	**15.00**	14.75	14.50	10.00
No. 1 cast, Pittsburgh	19.00	19.00	18.50	16.00
No. 1 cast, Philadelphia	*17.50*	19.00	19.00	16.00
No. 1 cast, Ch'go (net ton)	**17.00**	16.50	16.00	12.50
No. 1 RR. wrot, Phila.	17.00	17.00	17.00	13.50
No. 1 RR. wrot, Ch'go (net)	**13.50**	13.25	12.50	9.50

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	**$8.50**	$7.50	$6.50	$3.00
Foundry coke, prompt	**9.00**	8.00	7.00	4.25

Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	13.75	13.75	14.00	12.75
Electrolytic copper, refinery	13.50	13.50	13.75	12.62½
Zinc, St. Louis	**5.35**	5.27½	5.32½	4.35
Zinc, New York	**5.70**	5.62½	5.67½	4.85
Lead, St. Louis	5.55	5.55	5.50	4.25
Lead, New York	*5.75*	5.80	5.80	4.40
Tin (Straits), New York	....	31.00	32.50	29.87½
Antimony (Asiatic), N. Y.	5.00	5.00	5.25	4.75

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price, July 3, 1922, Finished Steel, 2.169c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

June 27, 1922,	2.169c.
June 6, 1922,	2.141c.
July 5, 1921,	2.557c.
10-year pre-war average,	1.689c.

These products constitute 88 per cent of the United States output of finished steel

Composite Price, July 3, 1922, Pig Iron, $24.19 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

June 27, 1922,	$24.05
June 6, 1922,	23.79
July 5, 1921,	21.08
10-year pre-war average,	15.72

morning. Demand for bars and shapes still is very insistent and no considerable salesmanship skill is necessary these days to sell pipe. In other lines, however, there has been something of a pause, if not in the buying, at least in the urgency of buyers. That buyers have been holding back specifications until after July 1, to secure the advantage of the lower freight rates, is not verified by the reports of railroads which note no very marked variation from the recent rate of traffic.

The pig iron market has been featured by the appearance of two or three fair sized inquiries for the steel making grades, but with no actual gain in business. Prices are sustained chiefly by high costs, notably of coke, which is costing Valley furnaces at least $10, and in some instances more, delivered. Expectation of an early revival of buying is reflected in a stronger undertone to the scrap market.

Pig Iron.—The N. & G. Taylor Co., Cumberland, Md., is in the market for 5000 tons of basic for delivery over the present quarter, 2000 tons this month, 2000 tons in August and 1000 tons in September; the Edgewater Steel Co. has put out an inquiry for 2000 tons of basic for immediate shipment, and a middle interest has been asking quotations on 1500 tons of standard Bessemer. None of this business yet has been closed. Valley producers generally are quoting $25, furnace, for both basic and Bessemer, and suggestions that the former grade can be bought at $23 are believed to refer to a block of off-grade basic lying at the plant of one of the Youngstown district steel companies. Some of the merchant furnaces have entered reservations for their regular customers on foundry iron for the third quarter, on a basis of $24, Valley furnace, No. 2. The recent inquiry for 500 tons of gray forge iron by a wrought iron pipe manufacturer has been largely placed at $23.50, Valley furnace. The market on malleable iron is not quotable above $24.50, a local consumer who was quoted $25, Valley furnace, against a recent inquiry claiming that he had bought at $25, delivered. W. P. Snyder & Co. report the average price of both basic and Bessemer iron from Valley furnaces in June to have been $25 as compared with the May averages of $24.91 for basic and $24.40 for Bessemer.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.77 per gross ton:

Basic	$25.00
Bessemer	25.00
Gray forge	$23.50 to 24.00
No. 2 foundry	24.00
No. 3 foundry	23.50 to 24.00
Malleable	24.50

Ferroalloys.—Prices of English ferromanganese are inclined to stiffen as a result of the recent heavy purchases prompted by the fear of a high duty in the new tariff. We note one sale of 100 tons for early delivery at $70 c.i.f. Philadelphia and it is reported some of the English producers have advanced the price for August shipments or September deliveries to $72.50, because they are practically sold up against probable production over the next six weeks. The old price of $67.50, however, still is named by most English makers. Very little spiegeleisen is available for early delivery and prices are very firm and likely to advance if the proposed duty on ferromanganese is allowed to stand. This duty of $33.60 would mean a price for ferromanganese of more than $100, and present spiegeleisen prices would be out of line. Interest in other ferroalloys is almost nil.

We quote 78 to 82 per cent ferromanganese, $67.50 c.i.f. Atlantic seaboard for domestic and $67.50 to $70 for English. Average 20 per cent spiegeleisen, $36 furnace; 16 to 19 per cent, $35 furnace; 50 per cent ferrosilicon, domestic, $55 to $60 furnace, freight allowed. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, $41.50; 11 per cent, $44.80; 12 per cent, $48.10; 13 per cent, $52.10; 14 per cent, $55.10; silvery iron, 6 per cent, $30; 7 per cent, $31; 8 per cent, $32.50; 9 per cent, $34.50; 10 per cent, $36.50; 11 per cent, $39; 12 per cent, $40.50. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $4.06 per gross ton.

Structural Material.—There is an unusually wide variation in quotations. Contracts are known to be outstanding at 1.50c. while the Steel Corporation price is supposed to be 1.60c. and independents are at 1.70c., 1.75c. and 1.80c. Only tonnages that are attractive from a mill standpoint, however, can be placed as low as 1.60c., and 1.70c. is the going minimum upon such tonnages as are coming out. Fabricating shops in this district are fairly busy, although the bulk of the orders is for small tonnages. Plain material prices are given on page 55.

Plates.—High costs and the fact that a number of mills cannot be operated profitably at present prices, together with the sold-up condition of mills in operation, account for the strength of the market rather than the demand. New business actually is moderate in this district. Really attractive tonnages can be placed as low as 1.60c., but the inquiries coming out generally are unattractive, and on these 1.70c., Pittsburgh, is minimum. Prices are given on page 55.

Sheets.—The supply situation is tight, because mill booking are sufficient in the case of the American Sheet & Tin Plate Co. to sustain the recent rate of operations of about 90 per cent of capacity right through the present quarter, without additional orders, while orders of the independents represent practically two months' operations at the recent rate of more than 80 per cent. With labor shortages developing and hot weather ahead, the indications are that much business will be unfilled at the end of the quarter. This week's production will be low at all mills because the mills that did not suspend Saturday for the holiday had only a small number of men at work today. All makers of automobile sheets are far behind because few automobile makers were prepared for the business they have taken. The American Sheet & Tin Plate Co. still is quoting automobile body stock at $4.50 base, but cannot ship promptly on new business, while independents are quoting and obtaining $4.75 to $4.85. Premiums of $3 to $5 a ton over regular quotations still are being asked by some independents for early shipments, but only small tonnages are moving at the higher figures. Prices are given on page 55.

Tin Plate.—The market is quiet, although some makers are beginning to get specifications on August and September shipments. On such order for 100,000 boxes recently was placed. The Northwest is reported to have a heavy crop of berries and other small fruit this year and one big can company will ship at least 50,000,000 more cans into that district than were called for on the original orders. The weather is reported favorable for tomatoes, but there has been so much rain that there is doubt about the size of the green corn pack. Uncertainty about the canning crops is what is holding up tin plate business at present. There is no weakening in prices because the present base of $4.75 per base box is claimed to be low enough on today's material and labor costs. This price was quoted when sheet bars and fuel were much cheaper than at present.

Hot-rolled Flats.—Prices have strengthened further since last reports, with 2.50c base Pittsburgh, now the minimum of the independent makers on new business and as high as 2.75c being obtained on the light gages of narrow material, where early shipment is demanded. There has been no formal announcement with regard to prices on these products by the Steel Corporation, but it is reported to be heavily committed and is not a factor as far as early shipments are concerned. Its last formal quotation was 2.25c base. Announcement of the price on cotton ties is waited with much interest. On the basis of 2.50c for hoops, plus the extra of 35c. per 100-lb. for 15/16-in. 19 gage, the price would be about $1.28 per bundle of 45-lb. It is believed that the operating price would be about $1.30.

Wire Rods.—Independents have put the base on common soft rods to $40 Pittsburgh and Youngstown, and this advance has been adopted informally by the American Steel & Wire Co. The former extras of $5 per ton for screw stock rods and of $7 to $10 per ton for high carbon steel are preserved. The new prices are on contracts and more probably would be asked on other business.

We quote No. 5 common basic or Bessemer rods to domestic consumers $40, chain rods $40; screw stock rods, $45; rivet and bolt rods and other rods of that character, $40; high carbon rods, $47 to $50, depending on carbon, per gross ton, f.o.b. Pittsburgh or Youngstown.

Wire Products.—The American Steel & Wire Co. last week reduced the price of woven wire fence $5 per ton and inaugurated fall datings against new purchases. This action was accompanied by a withdrawal of all price guarantees previously in effect. Independent makers have fallen in line, the new discount being 73 per cent off list for car loads to jobbers and 70½ per cent off list on carloads to dealers. Prices of wire products have pretty generally settled to the bases long observed by the American Steel & Wire Co. Independents still are quoting advances over these levels of $2 a ton on all lines except plain wire, but demand is not stout enough to sustain the premiums. Prices are given on page 55.

Semi-Finished Steel.—Reports as to demand vary, but that the edge is off is the prevailing idea, and while prices are firm, this is due more to the influence of costs than because of a pressing demand. In a general way, $35 still is a fair appraisal of prices for billets, sheet bars and slabs. A Youngstown maker has taken considerable business in sheet bars in the East at $37.50, Youngstown, and sales are also reported up to $38, Pittsburgh. On the other hand, a middle interest who recently was appealed to by a maker to find an outlet of 2000 tons for prompt shipment had much difficulty in making the sale at $35. Steel production is still high despite the coal strike and some companies have small supplies over contract requirements. A lake front producer recently had slabs and billets in moderate tonnages for early delivery. Forging billets and blooms are stronger with sales reported as high as $45 mill or about $44, Pittsburgh, and even $48, mill, was paid for a small lot, probably because of a freight advantage to destination enjoyed by the maker. An Allegheny Valley sheet maker is understood to have closed for his third quarter sheet bar requirements with a western Pennsylvania mill at $35, and the Steel Corporation price to regular customers for the present quarter is reported to be $33.

We quote 4 x 4-in. soft Bessemer and open-hearth billets at $35; 2 x 2-in. billets, $35; Bessemer and open-hearth sheet bars, $35; slabs, $35; forging billets, ordinary carbons, $40, all f.o.b. Youngstown or Pittsburgh mills.

Cold-rolled Strips.—The price is unchanged at 4c., base, Pittsburgh, despite the advance of $2 per ton in hot-rolled strips. Premiums for delivery are rare, as the peak of automotive industry activities has been reached and this as well as other consuming industries are covered by contracts against normal third quarter requirements.

Iron and Steel Bars.—While demands for some other lines have diminished, mills still are besieged by buyers for steel bars and deliveries are becoming

more deferred, some makers now being unable to definitely assure shipments until late in September. Little headway will be made toward cutting down obligations this week, as few of the mills in this district will start up before Wednesday and some will be down all this week. If 1.60c. can be done at all, it is against deliveries too far away to interest buyers, most of whom want early shipments. We regard the quotable market as 1.70c. to 1.80c. base, Pittsburgh. Reinforcing bars from new steel command the same price with those rolled from old rails held at 1.60c., iron bars are firm, this being due chiefly to higher costs, through demand is gaining.

We quote steel bars rolled from billets at 1.70c. to 1.80c.; reinforcing bars, rolled from billets, 1.70c. to 1.80c. base; reinforcing bars, rolled from old rails, 1.60c.; refined iron bars, 2.20c. in carloads, f.o.b. mill, Pittsburgh.

Steel Rails.—Light rails rolled from billets now are not available under 1.70c. base, the company recently quoting 1.60c. having gone to 1.70c. since a week ago. The Carnegie Steel Co. and the Cambria Steel Co. are quoting 1.75c. Business is not heavy, but there is a fairly good demand for early tonnages for shipment to coal mines in operation. These rails rolled from old standard sections are held at 1.60c.

We quote 25 to 45-lb. sections, rolled from new steel, 1.70c. to 1.75c. base; rolled from old rails, 1.50c. to 1.60c. base; standard rails, $40 per gross ton mill for Bessemer and open-hearth sections.

Iron and Steel Pipe.—There is no decrease in the insistency of the demand and independent makers of steel pipe are sold ahead on full weight pipe on the average about 10 weeks. The leading interest is quite as heavily committed on those sizes, finding the principal use in house and building construction. Oil and gas line pipe and oil well pipe are in almost as good demand as full weight goods. Wrought iron pipe is in steady demand. Prices are very firm, not only because of the heavy demand and sold up condition of makers, but because costs are high on account of the fuel situation and labor shortages. Discounts are given on page 55.

Cold-Finished Steel Bars and Shafting.—The recently established base of 2.10c., Pittsburgh, for carload lots, is well maintained, but it would be some exaggeration to call the market strong, since buyers usually can find accommodation, even for early delivery, at that price. The demand is good, but supplies appear ample. Ground shafting is unchanged at 2.50c., base, mill, for carload lots.

Nuts and Bolts.—Makers here have a comfortable business, but do not find the demand especially urgent from buyers in this immediate territory. Strength in bars, rods and bolt wire largely explains the firmness of nut and bolt prices here. Discounts are given on page 55.

Rivets.—Leading makers still report the demand to be good and that recent advances in prices in no way are restricting purchases. Prices are unchanged on heavy rivets and on small rivets, 70 and 5 per cent off list is becoming a more general price. Prices and discounts are given on page 55.

Spikes and Track Bolts.—Some makers of track bolts here now are holding to a minimum of $3.25, base, per 100 lb. for track bolts in carload lots, but the recent minimum of $3 still is being named by others, especially in competitive territory. Standard railroad spikes do not find much sale at higher than $2.25, base, per 100 lb. Prices are given on page 55.

Boiler Tubes.—The advances recently announced in seamless steel tubes by the Pittsburgh Steel Products Co. have been followed by other makers, but are not yet very well established, since it is believed consumers were allowed to cover probable requirements fairly well ahead at the previous prices. Steel skelp is short and firm and this is reflected in a stronger trend to lap welded steel tubes. The demand for charcoal iron tubes is helped by the stronger market in steel tubes. Discounts are given on page 55.

Steel Skelp.—Supplies still are extremely limited and 1.70c. now appears to be the minimum on both grooved and sheared material, at least of the independent makers. Some are asking 1.80c. The Steel Corporation is believed to be meeting the requirements of its regular customers at around 1.65c. for sheared and 1.70c. for grooved.

Coke and Coal.—Production has made no further gains since last week; on the contrary, it seems to have slipped back slightly during the past few days and prices have again stiffened. Available supplies of beehive oven coke have dwindled almost to the vanishing point and in anticipation of further decrease this week on account of the holiday, producers have had little trouble in obtaining fully a dollar a ton above the prices of a week ago. Very little furnace grade coke is available today at less than $8.50 and on most sales $9 has been the price. On spot tonnages of foundry grade, anywhere from $9 to $10 has been done in the past few days. On nearby coal the market is at a minimum of $4 per net ton at mines, for either steam or by-product grade, and as high as $5 at mines has been paid for a few small tonnages of nearby lump gas coal. Southern coal, which a week ago ranged from $3.25 to $3.50, now commands from $3.75 to $4 at mines.

Old Material.—Although interest in the market on the part of melters still appears to be passive, there is a plainly stronger undertone to prices of the steel works and blast furnace grades, due to expectations of another buying movement in the near future. A decline in the demand from Youngstown and Canton mills has resulted in no appreciable increase in offerings in this market from the West, nor has a similar development East brought freer offerings from that direction. Some dealers have paid as high as $18 to cover on short sales of heavy melting steel and while the current demand from the mills is light and a few cars have been sold as low as $17, round tonnages do not appear available below $17.50. As high as $20 is said to have been offered for railroad knuckles and couplers. Definite bids of $16.50 for cast iron borings, $18 for heavy breakable cast and of $14 for machine shop turnings have been made without bringing out much material. Cast scrap is less eagerly sought for open-hearth use than recently, but prices are sustained by light supplies. July railroad lists are substantial. It is said that those who bought the June scrap of one line paid a premium to the road to defer demanding shipping instructions until after July 1. A movement is on foot to get the railroads to cut their wrought scrap to 3-ft. lengths, the basis being that this preparation would make the material more readily marketable and mean higher returns to the roads.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows per gross ton:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh	$17.50
No. 1 cast, cupola size	$19.00 to 20.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	17.00 to 17.50
Compressed sheet steel	15.50 to 16.00
Bundled sheets, sides and ends	14.50 to 15.00
Railroad knuckles and couplers	19.00 to 19.50
Railroad coil and leaf springs	19.00 to 19.50
Low phosphorus standard bloom and billet ends	20.00 to 21.00
Low phosphorus plates and other grades	19.00 to 20.00
Railroad malleable	16.50 to 17.00
Iron car axles	26.00 to 27.00
Locomotive axles, steel	24.00 to 25.00
Steel car axles	17.50 to 18.00
Cast iron wheels	19.00 to 19.50
Rolled steel wheels	19.00 to 19.50
Machine shop turnings	14.00 to 14.50
Sheet bar crop ends	18.50 to 19.00
Heavy steel axle turnings	15.50 to 16.00
Short shoveling turnings	15.50 to 16.00
Heavy breakable cast	18.50 to 19.00
Stove plate	15.00 to 15.50
Cast iron borings	16.00 to 16.50
No. 1 railroad wrought	15.00 to 15.50

The initial statement of the Durant Motors of Canada, Toronto, Ont., covering operations for the two months ending April 30 last, indicates that the company has closed a satisfactory amount of business within the limited period of operation. The plant opened March 1, and in the period of two months total revenue from the sale of cars and parts, with receipts from other operations, amounted to $652,944.

Chicago

Pig Iron Advanced Half Dollar—Strike Expected to End Soon

CHICAGO, July 3.—Although the railroad shopmen have struck and they may be joined by the maintenance of way employees, the signalmen and clerks, they are expected to encounter the vigorous opposition of the Government, inasmuch as they have defied the Railroad Labor Board, a Government bureau. Railroads entering Chicago are moving energetically to replace their striking employees. A number of lines have advertised for shopmen and labor agencies are busy recruiting labor at the Railroad Labor Board wage scales. A typical advertisement by the New York Central points out that the strikers left the service in defiance of the United States Board and it promises sanitary housing with ample police protection at all times. It also quotes the Labor Board as stating that men taking the place of the strikers will not be considered as strike breakers but will be regarded as doing a public good.

In view of the attitude of the Government, it is felt that the railroad strike will be short lived. Efforts at Washington to settle the coal strike have also tended to reassure those whose business outlook has been rendered uncertain by the fuel shortage. Much as government interference in industry is opposed, it is generally felt that emergencies have arisen which demand prompt and decisive action.

There are no new developments in the finished steel market. Demand is still insistent and one large local producer reports last week one of the heaviest in the year in new business booked. Rapidly rising costs due in large part to the coal strike have resulted in another 50c. advance in pig iron. Steel works and blast furnace operations are unchanged.

Pig Iron.—Unabated demand and rising production costs have resulted in another advance of local iron to $24, base furnace, for future delivery and $25, for prompt shipment. While it is true that some melters have been frightened by the coal and transportation strikes, others are sending in repeat orders or are asking furnaces to anticipate shipments against contracts. Conservatism no doubt actuates the policy of most buyers, but the very fact that their orders represent actual needs makes the volume of present demand particularly impressive. Buying of spot iron is especially active. Foundry operations in this territory have reached a high level, the principal limitation on melt being a shortage of labor which is most pronounced among the malleable shops. Recent bookings of furnaces range from carloads up to several thousand tons. A local melter has closed for 1,500 tons of foundry for third quarter delivery and another Chicago user wants 2,000 tons for last half. An Indiana melter is in the market for from 1,000 to 1,200 tons of malleable for August and September shipment and a plow maker wants 300 to 500 tons of foundry for delivery at a Wisconsin plant during third quarter. Although most Southern producers are quoting and booking business at $20 base, Birmingham, foundry can still be bought from one maker at $18 Birmingham, and from at least one other furnace at $19. Thus with the new freight rate of $6 from Birmingham Southern foundry can be laid down in Chicago at $24, or at a parity with the local furnace price. There is a strong probability that the freight from Birmingham will be further reduced, as the Southern Railway has announced a new rate of $4.22 from Birmingham to St. Louis, or nearly $1 less than the rate which would have obtained under the 10 per cent reduction. The Buick Motor Co. has closed for 1,500 tons of silvery for last half requirements at the full Jackson County schedule. A Milwaukee melter is inquiring for 100 tons of low phosphorus for prompt shipment. The Thomas Furnace, Milwaukee, has set no definite date for a resumption of operation, apparently delaying action pending strike developments.

Copper free low phosphorus is quoted at from $34 to $35, Valley. The Wisconsin Steel Works is no longer offering its Sunday make for merchant consumption as it requires its entire output for steel production. Only one of its three furnaces is active at present with a second scheduled to go in about Aug. 15.

Quotations on Northern foundry, high phosphorus malleable and basic irons are f.o.b. local furnace and do not include a switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards, or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$31.65
Northern coke, No. 1, sil. 2.25 to 2.75	$24.50 to 25.50
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	24.00 to 25.00
Northern high phos	24.00 to 25.00
Southern No. 2	24.00 to 26.00
Malleable, not over 2.25 sil	24.00 to 25.00
Basic	24.00 to 25.00
Low phos. Valley furnace, sil. 1 to 2 per cent copper free	34.00 to 35.00
Silvery, sil. 8 per cent	37.29

Ferroalloys.—Ferromanganese for prompt shipment is bringing as high as $72.50 and $75 base seaboard. For September delivery a relatively small amount can still be bought at $67.50 seaboard, but the more general quotation is $70, the duty to be assumed by the buyer in each instance. Spiegeleisen is quiet after considerable buying. Owing to the inactivity of the market it is difficult to ascertain the ruling price on 50 per cent ferrosilicon. On prompt material quotations range from $57.50 to $62.50 delivered and on last half contracts $55 is named.

We quote 78 to 82 per cent ferromanganese, $77.56, delivered; 50 per cent ferrosilicon, $55 to $62.50, delivered; spiegeleisen, 18 to 22 per cent, $46.50 to $47, delivered.

Bars.—Demand for soft steel bars is heavy with prompt material difficult to obtain. Bar iron has again advanced $1 a ton to 1.80c., Chicago, with buying heavy and mills working to the limit of their present possible capacity. Hard steel bars are firm with mills well booked ahead.

Mill prices are: Mild steel bars, 1.75c. to 1.85c., Chicago; common bar iron, 1.80c., Chicago; rail carbon, 1.70c., mill or Chicago.

Jobbers quote 2.48c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.40c. for rounds and 3.90c. for flats, squares and hexagons. Jobbers quote hard and medium deformed steel bars at 2.38c. base. Hoops, 3.48c. Bands, 3.23c.

Bolts and Nuts.—Specifications were exceptionally heavy last week, reflecting the desire of buyers to get the benefit of the old discounts. After the heavy buying up to July 1, business is expected to be less active for a time. The ruling discounts are the same as those on page 55, except that they are on a Chicago base.

Jobbers quote structural rivets, 3.10c.; boiler rivets, 3.20c.; machine bolts up to ⅞ x 4 in., 50, 10 and 10 per cent off; larger sizes, 50 and 10 off; carriage bolts up to ⅞ x 6 in., 50 and 5 off; larger sizes, 45 off; hot pressed nuts, squares and hexagons, tapped, $3.25 off; blank nuts, $3.50 off; coach or lag screws, gimlet points, square heads, 60 per cent off; quantity extras are unchanged.

Wire Products.—The leading interest has advanced wire rods to $40 a ton, but has reduced woven wire fencing by increasing the discount 2½ points to 70½ per cent off to consumers and 73 per cent off to jobbers. Demand for nails and plain wire is strong. For mill prices see finished iron and steel, f.o.b. Pittsburgh, page 55.

We quote warehouse prices, f.o.b. Chicago: No. 9 and heavier black annealed wire, $3.10 per 100 lb.; No. 9 and heavier bright basic wire, $3.25 per 100 lb.; common wire nails, $3.25 per 100 lb.; cement coated nails, $2.75 per keg.

Sheets.—The local independent is out of the market and consumers are experiencing difficulty in placing their business with any mill, particularly when third quarter delivery is desired.

Mill quotations are 3.15c. to 3.30c. for No. 28 black, 2.40c. to 2.50c. for No. 10 blue annealed and 4.15c. to 4.30c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote blue annealed, 3.63c.; black, 4.45c.; galvanized, 5.45c.

Structural Material.—Construction activity is in full swing as evidenced by the fact that Chicago building permits in June broke all previous records. Fabricating shops have considerable work ahead, and mills are choked with orders for plain material.

The mill quotation on plain material is 1.75c. to 1.85c., Chicago. Jobbers quote 2.58c. for plain material out of warehouse.

Plates.—Demand is still strong, one of the leading local producers reporting that last week was one of the heaviest in the year in new business booked. Much of this tonnage is coming from railroad carbuilders and is being taken for indefinite delivery with the probability that shipments will be actually made late in the year. The Marland Refining Co., Oklahoma City, Okla., has let 20 small tanks, requiring 600 tons of steel, to the Chicago Bridge & Iron Works.

The mill quotation is 1.75c. to 1.85c., Chicago. Jobbers quote 2.58c. for plates out of stock.

Cast-Iron Pipe.—New municipal work consists largely of small tonnages for smaller cities, the larger municipalities with a few exceptions having covered their needs. Orders from private sources are still large. The market is strong at $37 to $38, Birmingham, for 6-in. and larger. Premiums of $2 to $3 a ton are being obtained for early shipment, as pipe shops are well booked ahead. Freight rates from Birmingham have been reduced 90c. a ton, so that the minimum Chicago delivered price quoted below is lower than that published a week ago. Chicago will soon enter the market for 500 tons, and Lake Forest, Ill., has taken bids on 100 tons. The United States Cast Iron Pipe & Foundry Co. is low bidder on 100 tons for Hammond, Ind.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $49.20 to $50.20; 6-in. and above, $45.20 to $46.20; class A and gas pipe, $3 extra.

Rails and Track Supplies.—Buying of spikes, bolts, tie plates and angle bars is brisk, orders for standard spikes ranging up to 16,000 kegs and for track bolts up to 12,000 kegs.

Standard Bessemer and open-hearth rails, $40; light rails rolled from new steel, 1.75c., f.o.b. makers' mills.
Standard railroad spikes, 2.16c. to 2.25c., Pittsburgh; track bolts with square nuts, 3.16c. to 3.25c., Pittsburgh; tie plates, steel and iron, 1.85c., f.o.b. mill; angle bars, 2.40c., f.o.b. mill.

Steel Castings.—Considerable business has been closed to get the benefit of the discounts effective until July 1. On outstanding quotations on car castings, however, buyers have been given the privilege to close at the old discounts until July 15. The general tone of the market is firm, although there are isolated instances of price cutting.

Reinforcing Bars.—Recent awards include: Kalamazoo, Mich., Vegetable Parchment Co. plant, 750 tons, to Rochester Bridge Co.; University of Minnesota Library Building, 400 tons, to Concrete Steel Co.; Manitowoc, Wis., High School, 175 tons, to Truscon Steel Co.; Mercy Hospital, Oshkosh, Wis., and State Highway Bridge, Ixonia, Wis., 100 tons each, to Corrugated Bar Co.; Speedway and Grandstand, Kansas City, Mo., 500 tons, to Kansas City Structural Steel Co. The Santa Fe Railroad is in the market for 300 tons.

Coke.—The price of $11.25 delivered Chicago switching district named on local by-product foundry coke, July 1, will apply on business taken this month only. Because of the uncertainties of the fuel situation, the ovens are not disposed to commit themselves any farther ahead. A Southern by-product plant is offering foundry coke at $10.50 delivered Chicago.

Old Material.—Demand is growing more active and prices have rather generally advanced 25c. to $1 a ton. It is evident that more consumers than had been expected held up buying until the new freight rates became effective. The recent advances in pig iron and the possibility of delayed shipments from blast furnaces if the coal strike continues are also given as reasons for the resumption in buying. In some quarters, the freight rate reduction was expected to result in an easier market because it would release shipments from outlying points. It appears, however, that the increased supply resulting from lower rates as well as from greater scrap production by manufacturing plants is balanced by increased consumption. A local steel works has closed for a round tonnage of heavy melting at a maximum price of $15.50 per ton delivered, and has also made liberal purchases of special grades, including 10,000 tons of low phosphorus heavy melting steel. All of the low phosphorus grades are in greater demand and have advanced proportionately. This material has been low in comparison with the price of low phosphorus pig iron, which is about $40 delivered, Chicago. Iron mill grades are moving in greater volume as bar iron mills increase their production. There is also a widespread demand for cupola and malleable scrap. Railroad offerings include blind lists issued by the Michigan Central and the Big Four.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Iron rails	$18.00 to $18.50
Cast iron car wheels	18.50 to 19.00
Relaying rails	22.50 to 27.50
Rolled or forged steel car wheels	17.50 to 18.00
Steel rails, rerolling	16.00 to 16.50
Steel rails, less than 3 ft	17.00 to 17.50
Heavy melting steel	15.00 to 15.50
Frogs, switches and guards cut apart	15.00 to 15.50
Shoveling steel	14.50 to 15.00
Drop forge flashings	10.50 to 11.00
Hydraulic compressed sheet	12.50 to 13.00
Axle turnings	12.50 to 13.00

Per Net Ton

Iron angles and splice bars	16.50 to 17.00
Steel angle bars	14.50 to 15.00
Iron arch bars and transoms	17.00 to 17.50
Iron car axles	22.50 to 23.00
Steel car axles	15.50 to 16.00
No. 1 busheling	11.50 to 12.00
No. 2 busheling	6.75 to 7.25
Cut forge	13.00 to 13.50
Pipes and flues	10.00 to 10.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	13.50 to 14.00
Steel knuckles and couplers	15.50 to 16.00
Coil springs	16.00 to 16.50
No. 1 machinery cast	17.00 to 17.50
No. 1 railroad cast	16.00 to 16.50
Low phos. punchings	15.00 to 15.50
Locomotive tires, smooth	13.00 to 13.50
Machine shop turnings	8.50 to 9.00
Cast borings	11.00 to 11.50
Stove plate	14.50 to 15.00
Grate bars	13.50 to 14.00
Brake shoes	13.50 to 14.00
Railroad malleable	15.50 to 16.00
Agricultural malleable	15.50 to 16.00

Railroad Equipment Business

Car purchases which came to light for the past week total 5000, a substantial addition was made to the car business under inquiry and activity marked the negotiations in locomotives.

The Western Pacific has ordered 2000 refrigerator cars from the American Car & Foundry Co. The Norfolk & Western will place orders this week for 2000 70-ton steel hopper cars and 1000 box cars.

The Nashville, Chattanooga & St. Louis Railroad has increased the number of cars for which it is inquiring from 750 to 1000, its revised inquiry calling for 750 cars, 150 stock and 100 flat cars. It is also in the market for 17 passenger service cars.

The Chicago Great Western has distributed repairs on 527 box cars as follows: 154 to Sheffield Car & Equipment Co., 173 to Siems-Stembel Co., 200 to Pullman Co.

The Chicago, Milwaukee & St. Paul is inquiring for 700 underframes.

The Pere Marquette is in the market for 1000 box car repairs.

The Chicago & Eastern Illinois is inquiring for 15 baggage cars and the Santa Fe for 8 buffet cars.

The Boston & Maine Railroad has made preliminary plans for the purchase of 22 type 0-8-0 switching locomotives, two type 0-8-8-0 Mallet switching locomotives, 65 steel passenger coaches, 20 steel smoking cars, 8 steel baggage-smoking cars, 5 steel baggage and mail cars and 25 milk cars.

The New York, Chicago & St. Louis has ordered 14 locomotives from the Lima Locomotive Works.

The Southern has bought 15 Mikado type engines from the American Locomotive Co., and is also in the market for 15 Pacific type locomotives.

The Chicago & Eastern Illinois has placed 10 Mikado type engines with the American company and is about to order 6 Pacific type.

The Milwaukee Rolling Mill Co., Milwaukee, manufacturing blue annealed and black sheets, is reported to have under consideration tentative plans for the enlargement of the plant, completed about 18 months ago. This has been in operation 24 hr. a day for nearly a year past. Details of the proposed extensions are not available as yet. Boyd B. Jack is general manager.

New York

Coke Situation More Serious—Some Foreign Pig Iron Coming In

NEW YORK, July 3.

Pig Iron.—The scarcity of high silicon irons is becoming more pronounced, owing to the increased cost of coke and the difficulty of obtaining coke supplies, and one company which is selling on a basis of $25.50 eastern Pennsylvania furnace for No. 2 plain and $26.50 for No. 2 X, would sell No. IX at $27.50, but is not seeking orders in the high silicon irons. During the past week more has been heard in regard to foreign iron. A sale of 100 tons of Scotch was made to an up-State furnace at about $25.50, New York. At Baltimore, 500 tons of Middlesbrough was delivered and about 2000 tons more is on the way, the price being about $24.50, Baltimore. No important sales have been made during the past week and the market has been very quiet. This is attributed to a large extent to the holidays. Alabama iron can be bought at $18.50, Birmingham.

We quote delivered in the New York district as follows, having added to furnace prices $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$28.77 to	$29.77
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	27.77 to	28.77
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	26.77 to	27.77
Buffalo, sil. 1.75 to 2.25	28.91 to	29.41
No. 2 Virginia, sil. 1.75 to 2.25		29.44

Ferroalloys.—Demand for ferromanganese has declined. There is some inquiry for August shipment of British alloy, but not much desire on the part of consumers to place orders because of the possible tariff. It is evident that July shipments of the British alloy have been sold up and there is no evidence that consumers are not covered for immediate needs. Quotations are unchanged except for such lots of prompt or July shipments as are available, for which $70, seaboard, is easily obtained. The spiegeleisen market is quiet at unchanged prices and there are no developments in the 50 per cent ferrosilicon or the ferrochromium markets, except that specifications on contracts are heavy. Quotations are as follows:

Ferromanganese, domestic, seaboard, per ton	$67.50
Ferromanganese, British, seaboard, per ton	$67.50
Spiegeleisen, 20 per cent	$36.00
Ferrosilicon, 50 per cent, delivered, per ton	$55.00 to $60.00
Ferrotungsten, per lb. of contained metal	40c. to 50c.
Ferrochromium, 6 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr., delivered	12c. to 14c.
Ferrovanadium, per lb. of contained vanadium,	$3.00 to $3.50
Ferrocarbontitanium, 15 to 18 per cent, 1 ton to carloads, per ton	$200.00

Ores

Manganese ore, foreign, per unit, seaboard	25c. to 26c.
Tungsten ore, per unit, in 60 per cent concentrates, nominal	$3.00 up
Chrome ore, basis 48 per cent Cr_2O_3, crude, per unit, Atlantic seaboard	40c. to 45c.
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	40c. to 45c.

Finished Iron and Steel.—Bids submitted to the New York Central Railroad last week on 3000 tons of plates, shapes and bars for its third quarter requirements probably indicate the minimum at which the various bidders are now willing to accept business even from such a preferential customer as a large railroad system. The Carnegie Steel Co. bid 1.705c., base Youngstown, on all three items; the Illinois Steel Co. bid 1.755c., Chicago; the Inland Steel Co., 2c., mill, on plates and shapes. The Lackawanna Steel Co. bid 1.86c., West Seneca, N. Y., equivalent to 1.80c. at its mill; the Bethlehem Steel Co.'s bid was 2.02c., base, delivered at Newberry Junction, Pa., for all three items. Bids were also submitted on wire nails and staples, billets, axles and tires. The Cambria Steel Co.'s bid of 2.50c. per lb. base, Pittsburgh, on wire nails was the highest. The Jones & Laughlin Steel Co. bid 2.40c., Youngstown, while the American Steel & Wire Co. bid 2.40c., Farrell, Pa., or Cleveland. The Pittsburgh Steel Co.'s price was 2.502c., Youngstown. On billets, forging quality, the Cambria Steel Co. quoted $40, Pittsburgh; Donner Steel Co., $41, Buffalo; Lackawanna Steel Co., $40, West Seneca, N. Y., and Wheeling Steel Products Co., $39, Portsmouth, Ohio, all of which were base prices to which usual extras were added. On tires there were two bids of 5c. per lb., one for delivery at Newberry Junction, Pa., and the other f.o.b. Youngstown, while 5.20c. per lb., Pittsburgh, and 5.65c. per lb., Youngstown, were also bid. Fresh developments in the local steel market during the past week have been few, the three-day holiday, which was quite generally observed, having tended to hold back business. At least the holiday was credited as partly the cause for the quiet condition of the market, though there has been little business of any important character for the past two weeks. The uncertainty due to the coal and coke situation, on top of which now comes the strike of railroad shopmen, has apparently placed consumers in a quandary as to what buying policy to pursue. Indications are that most of them have decided to buy very cautiously for the present. Prices are strong, several companies now quoting 1.80c., Pittsburgh, on plates, shapes and bars, though purchases are being made at $2 a ton under these prices. Only in cases where buyers are willing to pay a premium for prompt delivery or where the tonnages are small has 1.80c. been obtained. One Eastern plate mill has advanced from 1.60c. to 1.70c. and an Eastern mill rolling shapes has made the same advance. An outstanding inquiry is for 7500 tons of semi-finished steel from a Buffalo maker of bolts, nuts and rivets.

We quote for mill shipments, New York, as follows: Soft steel bars and structural shapes, 2.04c.; bar iron, 1.94c., and steel plates, 1.94c. to 2.04c. On export shipments the freight rate from Pittsburgh to New York is 28.5c. per 100 lb., while the domestic rate is 34c.

High Speed Steel.—The market shows a distinct improvement, but buying is still from hand to mouth. Lumping sales of high speed and high carbon steels together June has been as satisfactory a month as any this year with most producers. The market is unchanged at about 75c. per lb. for 18 per cent tungsten high speed steel with special brands of some companies bringing up to 95c. per lb.

Cast-Iron Pipe.—Foundries in this district are unable to make better than two to three months deliveries. The demand is heavy from private sources for all sizes of pipe, but the scarcity is particularly severe in the smaller sizes, ranging from 6-in. to 12-in. Increased cost of coke and pig iron has caused makers in this district to advance prices $2.50 per ton. The Department of Water Supply, Gas & Electricity, New York, will open bids July 8, on 6100 tons of 6-in., 8-in., 12-in. and 20-in. pipe. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $53.30; 4-in. and 5-in., $58.00; 3-in., $68.30, with $4 additional for Class A and gas pipe.

Warehouse Business.—With the exception of black and galvanized sheets, prices are exceedingly stiff and there is a feeling that an upward revision may be made within the next ten days or two weeks. Despite strong efforts on the part of many warehouses to hold prices on black and galvanized sheets to the established schedule of 4.35c. and 5.35c. per lb., respectively, shading is prevalent and sellers in New York are reported to have quoted as low as 4c. and 5c. per lb. delivered to consumers through Connecticut or about 3.90c. and 4.90c. per lb. base, New York on black and galvanized. June is generally conceded to have been the best month this year by iron and steel warehouses, dealers in wrought iron and steel pipe and others. The brass and copper warehouses also report an improvement for June, despite a decided decline in business during the past two weeks. We quote prices on page 68.

Coke.—Preceding the holidays, beginning last Saturday, the coke market was very active, as consumers, fearing a reduction in output on account of the holidays, were pressing for deliveries and were trying to make purchases. It was, however, very difficult to obtain high grade coke and both furnace and foundry grades were quoted at $8.50 to $9.50, while the price of by-product was advanced 50c. to $10.50 and was being sold only to regular customers. Conditions were not improved early this week.

Old Material.—Prices are firmer and considering the holidays the market has been fairly active. Wierton, Monessen, Jones & Laughlin, Alan Wood and Bethlehem are buying. Cast scrap is strong. Stove plate is now quotable up to $10.50 to $11.00 per ton. The acute shortage of scrap of all kinds in Europe may lead to purchase in this market eventually. One buying office

of a German interest is reported to have offered up to as high as $12.00 per ton, f.a.s. New York, but unsuccessfully, while inquiries have been received from Italy offering $14.00 per ton, c.i.f. Italian port.

Buying prices per gross ton, New Yoork, follow:

Heavy melting steel, yard	$9.50 to $10.00
Steel rails, short lengths, or equivalent	11.00 to 11.50
Rerolling rails	11.00 to 11.50
Relaying rails, nominal	27.00 to 28.00
Steel car axles	16.00 to 17.00
Iron car axles	22.00 to 23.00
No. 1 railroad wrought	12.50 to 13.00
Wrought iron track	11.00 to 11.50
Forge fire	8.00 to 8.50
No. 1 yard wrought, long	10.50 to 11.00
Cast borings (clean)	9.00 to 10.00
Machine-shop turnings	9.00 to 10.00
Mixed borings and turnings	9.00 to 10.00
Iron and steel pipe (1 in. diam., not under 2 ft. long)	8.00 to 8.50
Stove plate	10.50 to 11.00
Locomotive grate bars	11.50 to 12.00
Malleable cast (railroad)	10.00 to 10.50
Cast-iron car wheels	13.00 to 13.50

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast	$18.00 to $19.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	16.50 to 17.00
No. 1 heavy cast, not cupola size	13.00 to 13.50
No. 2 cast (radiators, cast boilers, etc.)	12.00 to 12.50

Boston

BOSTON, July 3.

Pig Iron.—Sales of domestic iron the past week were confined to car lots of Buffalo at $25, furnace base, eastern Pennsylvania at $25 and $26 base, western Pennsylvania at $26 base, Virginia at $25 base, and Alabama at $18.50 base. The aggregate tonnage is unimportant. Buffalo iron at $23 is a thing of the past, while a northwestern Pennsylvania furnace with a freight of $6.58, advanced its price from $23 to $24 base and withdrew from the market. Eastern Pennsylvania furnaces quite generally are making $1 differentials in silicons. The domestic iron situation, barring Alabama, therefore is stronger, although not active. Brokers show considerable and the foundry trade little interest in foreign irons. A Taunton, Mass., stove maker bought 500 tons of Scotch iron equivalent to our No. IX at a price well below those quoted on domestic grades, but no other sales were reported for the past week. One steamer brought in 1000 tons of Scotch iron "to order" the past week as reported in THE IRON AGE and 500 tons consigned to Philadelphia. Scotch, silicon 2 to 2.75, is offered at about $26 to $26.50 landed Boston; English, silicon 2 to 2.50, at about $26; and French, silicon 2.50 to 3.50 at about $22.50 to $23. The only inquiry in the market of any size is one for 500 tons No. IX, third quarter delivery, from a Connecticut foundry.

We quote delivered at common New England points as follows, having added to furnace prices $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75	$29.15 to $30.65
East. Penn., sil. 1.75 to 2.25	28.65 to 29.65
Buffalo, sil. 2.25 to 2.75	30.41
Buffalo, sil. 1.75 to 2.25	29.91
Virginia, sil. 2.25 to 2.75	31.42
Virginia, sil. 1.75 to 2.25	30.92
Alabama, sil. 2.25 to 2.75	28.60 to 30.10
Alabama, sil. 1.75 to 2.25	28.10 to 29.60

Warehouse Business.—Early in the week the movement of iron and steel out of Boston stocks was fairly brisk, but business tapered off in the last few days, presumably because a very large percentage of the New England metal working plants were closed from Saturday to July 5. Notwithstanding the reduction in freight rates, there is common talk of still higher prices on bars, shapes, plates and sheets within the near future. Buying of bolts and nuts is on a fairly satisfactory scale, while wire products, aside from nails, have little call. Horseshoes are selling better than they were a month back.

Jobbers quote: Soft steel bars, $2.60½ per 100 lb. base; flats, $3.25½; concrete bars, $2.75 to $2.88; structural steel, $2.60½ to $2.70½; tire steel, $4 to $4.35; open-hearth spring steel, $4.50 to $6; crucible spring steel, $11.50; steel bands, $3.50; hoop steel, $4; cold rolled steel, $3.30 to $3.80; refined iron, $2.60½; best refined iron, $4.25; Wayne iron, $5.50; Norway iron, $6 to $6.50; plates, $2.70½ to $2.87½; No. 10 blue annealed sheets, $3.40½ to $3.63 per 100 lb. base; No. 28 black sheets, $4.90; No. 28 galvanized sheets, $5.90.

Coke.—Both the New England Coal & Coke Co., Boston, and the Providence Gas Co., Providence, R. I., have announced a further advance in prices on by-product foundry coke. This time spot fuel is advanced from $13 to $14.50, and contract from $12 to $13.50, delivered. The Boston concern also advanced its price on foundry coke to be delivered outside New England from $10 to $12, ovens. Both producers are now out of the market on contract coke, but previous to this announcement the New England Coal & Coke Co. booked a considerable tonnage for last half delivery at prices ruling date of shipment. Its decision to withdraw from the contract market is based on the uncertainty of the transportation and coal situation, and not because the capacity of ovens has been reached. Against the further advance in fuel is a reduction in the freight rate allowed on delivered prices. Heretofore delivered prices involved freight not exceeding $3.40 a ton. Today the allowance is $3.10, a reduction of a little less than 10 per cent.

Old Material.—A fairly good business in mixed borings and turnings for shipment to eastern Pennsylvania mills was put through by brokers the past week. In a few instances $8.75 f.o.b. shipping point was paid for shoveling material, but where bushings are involved, dealers will not pay more than $8 or $8.10. A few car lots of bundled skeleton were purchased by eastern Pennsylvania mills, while cotton ties were taken for New England delivery at $7.10 shipping point. Stove plate is quoted at 50c. a ton higher, but comparatively little is moving. Heavy melting steel is sentimentally firmer, but consumers have continued to hold off pending a reduction in freights. Most of the new business put through recently was made on contracts which provided for the buyer securing the benefit of reduced freights. Rates on scrap to Lebanon, Pa., are now $4.41, contrasted with $4.90 heretofore; to Johnstown, Pa., $5.25½, as against $5.84; to West Virginia points $5.52½, compared with $6.14 heretofore, and to other points proportionately lower. Delivered prices on machinery cast, insofar as applied to New England points, apparently have not been influenced by the reduction in freight rates.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$19.00 to $20.00
No. 2 machinery cast	17.00 to 18.00
Stove plate	14.00 to 14.50
Railroad malleable	15.00 to 15.50
Street car wheels	18.00 to 19.00

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$10.50 to $11.00
No. 1 railroad wrought	11.50 to 12.00
No. 1 yard wrought	10.00 to 10.50
Wrought pipe (1 in. in diam., over 2 ft. long)	8.00 to 8.50
Machine shop turnings	8.00 to 8.50
Cast iron borings, rolling mill	8.50 to 9.00
Cast iron borings, chemical	10.50 to 11.00
Blast furnace borings and turnings	8.00 to 8.50
Forged scrap and bundled skeleton	8.00 to 8.50
Street car axles and shafting	14.50 to 15.00
Rerolling rails	11.00 to 11.50

Birmingham

BIRMINGHAM, ALA., July 3.

Pig Iron.—Following booking of about 40,000 tons for the leading pipe interests by two or three makers and acknowledged bookings of 50,000 tons in June by the Sloss-Sheffield Steel & Iron Co., July entered under an apparently strong head toward $20 iron all around. The lion's share of the June business, it is admitted, was done on the $18.50 base, but the makers holding for $20 also made bookings of considerable tonnage over a scattered territory. Philadelphia took two lots of 100 and 500 tons at $20. A disconcerting factor was the quotation of $18, Birmingham base, by a Tennessee furnace just resuming and desirous of tonnage. An interesting sale was 3000 tons in Boston territory at base of $18.50 and $19. The mass of June business was done in St. Louis and Chicago territory, rail and water, iron from northern Alabama being conspicuous. The Tennessee company resumed at No. 1 furnace in Bessemer on foundry last week, but will change to ferromanganese on arrival of Brazilian ore now on the way up the Warrior River and will probably operate on ferromanganese until the 30,000 tons of ore are converted. The Republic Iron & Steel Co. is getting its third stack at Thomas in Birmingham prepared to operate. It is

thought it may go in about July 15. The stack of Central Coal & Iron Co. at Holt will be ready to resume toward the end of the month. On July 1 there were 21 active stacks in Alabama, 13 on foundry and 8 on basic.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	$18.50 to $20.00
Basic	18.50 to 19.50
Charcoal, warm blast	30.00 to 32.00

Finishing Mills.—Steel works will resume July 5 the Tennessee company continuing double turn at practically all mills with 100 per cent ingot production. The Gulf States Steel Co., American Steel & Wire Co., Conners Steel Co. and structural steel works are on or near full turn. Shipments out of Mobile last week included 200 tons of steel hoops and 250 tons of fence wire for Buenos Aires, 100 tons of fence wire for Montevideo and 50 tons of fence wire for Neuvitas, Cuba. Northern mills are not accepting new business in sheets and pipe.

Cast Iron Pipe.—Belated brokers have offered $60 and $65 for prompt shipment of sanitary pipe and some bookings have been made at these prices. Larger makers say their base is still $55. Shops are on full turn. Ten per cent wage advances have been made. Pressure pipe bookings include 400 tons of universal pipe for Detroit by the Central Foundry Co. and numbers of orders from southwestern points by Birmingham shops. Delivery is the burning question. Base is firm at $37.

Coal and Coke.—Coal production week ending June 24 was 360,000 tons, largest in five years. All mines are on full turn. Extra business incident to strike is from 65,000 to 80,000 tons a week. Base is $2.25 to $2.50 Pratt seam for spot deliveries. Iron Mountain and Rock Island have entered the market. Coke is firm at $5.50 to $6. Sloss-Sheffield Steel & Iron Co. is reducing the coke pile at its by-product plant at the rate of 1000 tons a day.

Old Material.—The scrap market is stronger than in several months and stocks on yards have been depleted. Cast scrap is now bringing $15 to $16.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails	$13.00 to $15.00
No. 1 steel	12.00 to 14.00
No. 1 cast	15.00 to 16.00
Car wheels	14.00 to 15.00
Tramcar wheels	13.00 to 14.00
Stove plate	13.00 to 14.00
Cast iron borings	6.00 to 7.00
Machine shop turnings	4.00 to 5.00

Buffalo

BUFFALO, July 3.

Pig Iron.—While No. 2 plain iron can still be purchased for $24 in some quarters, there is a stiffening apparent and $25 has been the consideration in several transactions. Only one seller has booked any considerable tonnage and 5000 tons of new business represents the total volume by this interest for the week. M. A. Hanna & Co., who operate the Buffalo Union Furnace Co., have put another furnace in blast. Inquiry has been good with all the selling factors and with several the situation is that they cannot consider third quarter business because of the amount of tonnage booked and are not ready to commit themselves on fourth quarter requests. There is no change in the fuel situation but July operation is assured on the same basis as has existed since the inception of the strike.

We quote f.o.b. per gross ton Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sil.	$25.00
No. 2X foundry, 2.25 to 2.75 sil.	24.50
No. 2 plain, 1.75 to 2.25 sil.	24.00
Basic	24.00
Malleable	24.50
Lake Superior charcoal	31.78

Warehouse Business.—Sheets are in better demand than other products and this is assumed to be due to the stringency with the mills. Prices on bolts have been advanced by mills, but the raise has not been passed along by warehouses as yet. No rush of orders appeared on account of the railroad labor unrest—a direct contrast to the situation at the time of the last threatened trouble.

Finished Iron and Steel.—None of the local selling agencies is in any better position in the matter of accepting business. One steel interest, manufacturing a line of specialties and which has its full complement of open hearths in operation, is able to use more steel than it produces and is in the market for billets. Some of the sellers report a heavier demand on bars, but the leaders in the selling field in this product are entirely unable to take the business. One agency is able to take only certain sizes in plates—⅜ in. and heavier and shapes only where rolling schedules permit. Tin plate is quiet and buyers are between seasons. An independent interest is taking orders on black sheets freely, but unable to consider offers of tonnage in galvanized or blue annealed. An inquiry for 8000 tons of plates, 1400 tons of shapes and 600 tons of bars is expected in the market if the efforts of a car company are successful in obtaining a contract for the repair of D., L. & W. cars. The Buffalo Structural Steel Co. is low bidder on 350 tons of shapes on the new Hurst Building, Buffalo, but the contract has not been let.

We quote warehouse prices, f.o.b. Buffalo, as follows: Structural shapes, 2.65c.; plates, 2.65c.; soft steel bars, 2.55c.; hoops, 3.30c.; bands, 3.15c.; blue annealed sheets, No. 10, 3.55c.; galvanized steel sheets, No. 28, 5.40c.; black sheets, No. 28, 4.40c.; cold-rolled strip steel, 6.05c.; cold-rolled round shafting, 3.35c.

Old Material.—Mills are showing more interest and there is a tendency on the part of dealers to hold heavy melting steel for better prices. Demand from outside the district for cast iron borings and car wheels has stiffened prices on those products.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel	$16.75 to $17.00
Low phos., 0.04 and under	18.00 to 19.00
No. 1 railroad wrought	16.00 to 16.50
Car wheels	17.00 to 18.00
Machine shop turnings	10.50 to 11.00
Cast iron borings	12.50 to 13.00
Heavy axle turnings	14.00 to 14.50
Grate bars	14.00 to 14.50
No. 1 busheling	15.00 to 15.50
Stove plate	15.00 to 15.50
Bundled sheet stampings	11.50 to 12.00
No. 1 machinery cast	18.00 to 18.50
Hydraulic compressed	15.00 to 15.50
Railroad malleable	17.00 to 17.50

St. Louis

ST. LOUIS, July 3.

Pig Iron.—The market for pig iron continues strong with prices unchanged for either Northern or Southern makes. Buying, however, has not been so heavy, the only sales of consequence being made by a Sheffield producer, whose quotation of $18.50 Birmingham, while other makers of Southern iron are quoting up to $20, Birmingham, is the attraction, indicating that price is considerable of a factor. The Sheffield maker's sales amounted to 2500 tons, which was in lots of from 35 to 200 tons, mostly to stove manufacturers. The St. Louis Federal Reserve Bank report shows that the melt of pig iron and scrap in the district increased approximately 8¾ per cent in May over the April level. The St. Louis bank review also states that seven leading stove manufacturers report sales in May 10 per cent to 115 per cent larger than for May, 1921, and 10 to 60 per cent more than in April, 1922. Five farm implement manufacturers and distributors reported to the bank that their May sales were from 6 to 82½ per cent larger than in April.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago and $5.17 from Birmingham and 81 cents average switching charge from Granite City:

Northern foundry, sil. 1.75 to 2.25 (third quar.)	$26.56
Northern malleable, sil. 1.75 to 2.25 (third quar.)	26.56
Basic (third quar.)	26.56
Southern foundry, all rail, sil. 1.75 to 2.25	$23.67 to 24.67
Southern foundry, water and rail, sil. 1.75 to 2.25, f.o.b. St. Louis	22.74

Finished Iron and Steel.—Structural steel fabricators report specifications received in May the heaviest in any month, the reports of the St. Louis Federal Reserve Bank say. June business continues also to be

good, although St. Louis contracts are for the most part small ones. Fabricators, however, continue to buy on a more or less hand to mouth basis, and have not yet begun to consider their fall requirements. Mills are well sold up, and the coal strike adds to the difficulties of placing business. James Stewart & Co. are the lowest bidders on the contract for the Government hospital to be built at Jefferson Barracks, involving about 400 tons of reinforcing bars, and a small amount of structural steel.

For stock out of warehouse we quote: Soft steel bars, 2.57½c. per lb.; iron bars, 2.57½c.; structural shapes, 2.67½c.; tank plates, 2.67½c.; No. 10 blue annealed sheets, 3.72½c.; No. 28 black sheets, cold rolled, one pass, 4.45c.; cold drawn rounds, shafting and screw stock, 3.50c.; structural rivets, $3.19½ per 100 lb.; boiler rivets, $3.29½; tank rivets, 7/16 in. and smaller, 60 per cent off list; machine bolts, large, 50 and 10 per cent; small, 50-10 and 10 per cent; carriage bolts, large, 55-5 per cent; small, 60 and 10 per cent; lag screws, 60 per cent; hot pressed nuts, square or hexagon blank, $3.50; and tapped, $3.25 off list.

Coke.—The substitution of coke for coal increases as the coal strike continues. Buying has been heavy, and it is expected that there will be considerable additional business placed with the decline in freight rates. The market for Connellsville coke is at $8.00 to $8.25.

Old Material.—The market for old material continues firm. Buyers are expected to enter the market as soon as the railroad situation improves. Special steel grades are strong, and large short interests exist in these grades. Melting rails and foundry grades are in good demand. Rolling mill and ordinary steel grades are quiet.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton

Old iron rails	$16.75 to $17.25
Steel rails, rerolling	14.25 to 14.75
Steel rails, less than 3 ft	15.00 to 15.50
Relaying rails, standard section	25.00 to 28.00
Cast iron car wheels	18.25 to 18.75
No. 1 heavy railroad melting steel	14.00 to 14.50
No. 1 heavy shoveling steel	13.00 to 13.50
Ordinary shoveling steel	12.50 to 13.00
Frogs, switches and guards, cut apart	14.00 to 14.50

Per Net Ton

Heavy axle and tire turnings	9.50 to 10.00
Steel angle bars	13.00 to 13.50
Iron car axles	23.00 to 23.50
Steel car axles	17.00 to 17.50
Wrought iron bars and transoms	18.50 to 19.00
No. 1 railroad wrought	12.75 to 13.00
No. 2 railroad wrought	11.75 to 12.25
Railroad springs	15.25 to 15.75
Steel couplers and knucklers	15.25 to 15.75
Cast iron borings	9.00 to 9.50
No. 1 busheling	11.00 to 11.50
No. 1 railroad cast	11.50 to 16.00
Stove plate and light cast	12.75 to 13.25
Railroad malleable	12.50 to 13.00
Pipe and flues	7.75 to 8.25
Machine shop turnings	8.50 to 9.00

Philadelphia

Quiet Week Due Largely to Strike Uncertainties—Costs Advancing

PHILADELPHIA, July 3.

Facing costs which will be higher in July than they were in June, steel and pig iron producers are making every effort to obtain a sufficient price to minimize losses or eke out a small profit. Despite the large volume of business during the past two or three months, some of the independent steel companies have not shown a profit on the first half's operation, nor even on the past two months. One independent company in figuring its July costs found that out of about 60 items of all kinds bought for its blast furnaces, only three or four had not advanced in price within the past month. Mounting fuel costs are the largest single element in iron and steel manufacture, coke costing about $11 a ton at eastern furnaces, or about $13.75 per ton of foundry iron. Based on to-day's prices, foundry pig iron is costing as high as $26 a ton to produce at some eastern Pennsylvania furnaces and even under the most favorable operating and raw material conditions, it is asserted that this manufacturing cost will not be shaded very much during July unless a settlement of the coal strike should bring lower fuel costs. Blast furnaces are still shipping $19 and $20 iron, which brings their average down and adds to their losses.

In both the steel and pig iron trade, the past week has been marked by extreme quiet, a situation due in part to the holidays, but more largely to the increased uncertainty with regard to the coal and railroad strikes. Sellers are quite as anxious to be cautious in selling as buyers are in buying. Resumption of active buying is not looked for until the strike clouds have cleared away, permitting the trade generally to plan for the future with more assurance.

Pig Iron.—Another quiet week in the eastern pig iron trade has brought no material change in the situation, which, as it stands, leaves both producers and consumers without reliable guidance in planning for the future. A great deal of third quarter buying, it is known, must still be done, but consumers apparently prefer to worry along with the iron they already have in sight, picking up spot carloads when necessary, rather than try to anticipate what may happen when the coal and railroad strikes shall have been settled. Pig iron costs are mounting, as referred to in a paragraph above, which induces conservatism in selling as well as in buying. Domestic producers of iron are not anxious to see prices go higher, as they fear further importation of foreign iron, which already is largely dominating the spot market. Nearly all of the local merchants in seeking supplies to meet urgent requirements of their customers have bought some foreign iron because furnaces here are unwilling to accept their orders. The cheapest iron being offered is from France at $23 a ton, f.o.b. cars, Philadelphia, for a grade closely approximating eastern Pennsylvania No. 2X except that the phosphorus runs as high as 1.75 per cent. Not all buyers are satisfied to use the foreign iron, however, and they are offering as high as $28 and $30, furnace, for domestic No. 2X. The scarcity of foundry iron may shortly be accentuated by buying of basic by eastern steel companies. One company has bought about 1500 tons at $26.75, delivered, and is seeking a few thousand tons more, while an eastern plate manufacturer is seeking a tonnage for shipment this month. The American Bridge Co. has bought 10,000 to 12,000 tons of basic for August-September shipment, but the price reported to have been paid is about $2 a ton less than eastern furnaces are apparently willing to do, which leads the local trade to assume that the order was placed with another Steel Corporation subsidiary. Local furnaces are quoting basic at $25, furnace, but on the 1500-ton sale referred to the furnace price was slightly above $25. A sale of 3000 tons of gray forge at about $25.50, delivered, has been made. The only important inquiry for foundry iron is from the National Radiator Co., which wants 1000 tons for its Trenton, N. J., and Johnstown, Pa., plants. The prices printed below are slightly lower than last week's quotations, due to the reduction in freight rates.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia, and include freight rates varying from 76 cents to $1.64 per gross ton:

East Pa. No. 2 plain, 1.75 to 2.25 sil.	$26.64 to $27.26
East. Pa. No. 2X, 2.25 to 2.75	27.64 to 28.26
East. Pa. No. 1X	28.64 to 29.76
Virginia No. 2 plain, 1.75 to 2.25 sil.	29.17 to 30.17
Virginia No. 2X, 2.25 to 2.75 sil.	30.17 to 31.17
Basic delivery eastern Pa.	25.75 to 26.75
Gray forge	25.50 to 26.00
Malleable	27.50 to 28.00
Standard low phos. (f.o.b. furnace)	30.00
Copper bearing low phos. (f.o.b. furnace)	30.00

Ferroalloys.—The situation in ferromanganese has not changed within the past week. The quotation of both British and domestic producers is $67.50, Atlantic seaboard. Spiegeleisen is quoted at $36, furnace.

Semi-Finished Steel.—There is considerable divergence in prices for forging billets. One mill is quoting $38 to $40, Pittsburgh, while another has been paid $40 to $45, Pittsburgh. Sales of 500 tons at $40, 500 tons at $42.50 and a carload at $45, all base Pittsburgh, are reported by one maker. Rerolling billets are uniformly quoted at $35, Pittsburgh. The new rate on semi-finished steel from Pittsburgh to Philadelphia is $5.17 per gross ton.

Plates.—One Eastern company which has been selling plates at 1.60c., Pittsburgh, has advanced its price to 1.70c., while two or three others are now quoting 1.80c. One effect of the stronger situation in plates is to advance the base prices at which the lighter gages are quoted. Until recently sizes under 3/16 in. were sold on the ordinary tank steel base, but now there are special base prices, with usual extras, for lighter gages up to 2c. per lb., base, for No. 8 gage. A contract for 1000 tons of light plates for third quarter at 1.95c., Pittsburgh, is reported by one Eastern maker, while on 300 tons for prompt shipment the price was 2.05c., mill. The Pennsylvania Railroad will inquire probably this week for 5000 to 10,000 tons of car repair plates. Bids close July 5 on 3000 tons of plates, shapes and bars for the Norfolk & Western Railroad. We quote ¼ in. and heavier at 1.70c. to 1.80c., Pittsburgh, to which is added the new freight rate of 32½c. per 100 lb. to Philadelphia and 31½c. to Baltimore.

Structural Material.—An advance in its price from 1.60c. to 1.70c., Pittsburgh, on structural shapes by an Eastern mill places this market firmly upon the 1.70c. level, while some mills are asking 1.80c., Pittsburgh. One mill is restricting its orders only to those specifications which can be gotten out economically. We quote plain material at 1.70c. to 1.80c., Pittsburgh. The new freight rate on finished material to Philadelphia is 32½c. per 100 lb. and 31½c. to Baltimore.

Bars.—The price situation on steel bars continues stronger than that of plates and shapes and 1.80c., Pittsburgh, is more nearly the price which consumers must now pay for early shipment, though 1.70c. still obtains on considerable business where mills cannot do better than six or eight weeks. Bar iron prices are unchanged by Eastern makers at 1.60c., Pittsburgh, for carloads and 1.70c. for less than carloads.

Sheets.—Most of the mills have now covered their regular customers for all of third quarter at 2.40c. for blue annealed, 3.15c. for black and 4.15c. for galvanized, base Pittsburgh, and prices asked for prompt shipment are uniformly higher, varying from $2 to $5 a ton.

Bolts, Nuts and Rivets.—During the week or two prior to the end of second quarter users of bolts, nuts and rivets have specified very heavily on their contracts, in some instances buyers specified more than their contracts called for. Third quarter prices are considerably above those ruling on second quarter contracts.

Warehouse Business.—The demand for steel out of stock continues fairly active, buyers usually complaining that they are not getting shipments as expected from the mills. Prices are unchanged, but there will probably be slight readjustments to meet the reduction in freight rates. We quote for Philadelphia delivery as follows:

Soft steel bars and small shapes, 2.56c.; iron bars (except bands), 2.56c.; round edge iron, 2.75c.; round edge steel, iron finish, 1½ x ½ in., 2.75c.; round edge steel planished, 3.50c.; tank steel plates, ¼-in. and heavier, 2.66c.; tank steel plates, 3/16-in., 2.85c.; blue annealed steel sheets, No. 10 gage, 3.40c.; black sheets, No. 28 gage, 4.25c.; galvanized sheets, No. 28 gage, 5.25c.; square twisted and deformed steel bars, 2.65c.; structural shapes, 2.66c.; diamond pattern plates, ¼-in., 4.35c.; 3/16-in., 4.50c.; spring steel, 3.50c.; round cold-rolled steel, 3.20c.; squares and hexagons, cold-rolled steel, 3.70c.; steel hoops, No. 13 gage and lighter, 3.35c.; steel bands, No. 12 gage to 3/16-in., inclusive, 3.21c.; iron bands, 3.90c.; rails, 2.36c.; tool steel, 8c.; Norway iron, 5.50c.; toe calk steel, 4.50c.; tire steel, 2.65c.; planished tire steel, 3.40c.

Old Material.—Although the Pittsburgh market is strong on some grades, weakness has appeared in Eastern scrap prices within the past few days. There are more sellers than buyers and this situation, as usual, has resulted in concessions on certain grades, the most marked of which is on No. 1 cast, of which 500 tons has been sold at $17.50, delivered to a nearby cast iron pipe foundry, a reduction of $1.50 a ton from our last week's quotation. We note a sale of 200 tons of heavy breakable cast at $18, delivered. Borings and turnings and pipe are off about 50c. a ton. Cast iron borings are reported to have been sold at $16, Pittsburgh, and No. 1 cast at $20 to $21. Users of scrap have apparently expected that they would derive the benefit from freight rate reductions, but dealers say that this advantage will go to the shipper and not to the consumer. We quote for delivery at consuming points in this district as follows:

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$15.00 to $15.50
Scrap rails	15.00 to 15.50
Steel rails, rerolling	17.00 to 17.50
No. 1 low phos., heavy 0.04 and under	22.00 to 24.00
Cast iron car wheels	17.50 to 18.50
No. 1 railroad wrought	17.00 to 17.50
No. 1 yard wrought	15.00 to 15.50
No. 1 forge fire	13.00 to 13.50
Bundled sheets (for steel works)	13.50 to 14.00
No. 1 busheling	15.00 to 15.50
No. 2 busheling	12.00 to 13.00
Turnings (short shoveling grade for blast furnace use)	13.00 to 13.50
Mixed borings and turnings (for blast furnace use)	13.00 to 13.50
Machine-shop turnings (for steel works use)	13.00 to 13.50
Machine-shop turnings (for rolling mill use)	13.50 to 14.00
Heavy axle turnings (or equivalent)	13.50 to 14.00
Cast borings (for steel works and rolling mills)	14.00 to 14.50
Cast borings (for chemical plants)	16.50 to 17.50
No. 1 cast	17.50 to 18.50
Railroad grate bars	14.50 to 15.00
Stove plate (for steel plant use)	15.00 to 15.50
Railroad malleable	15.00 to 15.50
Wrought iron and soft steel pipes and tubes (new specifications)	13.50 to 14.00
Shafting	20.00 to 20.50

Cleveland

Ore Shipments by Lake Heavy—Pig Iron Fairly Active

Iron Ore.—Activity in the ore market has subsided somewhat, although a few sales were made during the week in lots of 25,000 tons and under and some new inquiry came out. Several of the round lot inquiries that have been noted are still pending. In some cases, the fuel situation is causing delay in placing orders. If lack of coke prevents operations, furnaces will not want the ore. Lake shipments are now heavy. The June movement was 6,629,711 gross tons as compared with 3,600,189 tons during June of last year. Shipments up to July 1 were 8,351,177 tons as compared with 6,371,227 tons during the corresponding period a year ago.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, $5.95; Old range non-Bessemer, 51½ per cent iron, $5.20; Mesabi Bessemer, 55 per cent iron, $5.70; Mesabi non-Bessemer, 51½ per cent iron, $5.05.

Pig Iron.—While sales have fallen off somewhat, the market continues fairly active in small lot orders. Prices on foundry iron shows a stiffening tendency, as some of the lake furnaces are trying to get 50c. more or $23.50. The market is generally represented by a spread of $23 to $23.50, although one Cleveland seller has taken some outside business at $24. For Cleveland delivery 400 tons was sold at $24.50, although $24 has been the usual quotation. The most active seller booked about 10,000 tons during the week. Sales include 1500 tons of malleable iron to a Michigan melter and the following foundry iron orders: Five hundred tons to an Ohio jobbing foundry; 400 tons to an Indiana implement manufacturer; 400 tons to an Indiana automobile foundry; 500 tons to a Michigan automobile foundry, and 600 tons to a northern Ohio machine tool manufacturer. The N. & G. Taylor Co. is inquiring for 5000 tons of basic iron. A New York implement manufacturer is inquiring for 1200 tons of malleable and 800 tons of foundry iron and a Muncie, Ind., foundry for 1200 to 1500 tons of malleable iron. Small lot sales of Southern iron are being made at $18.50, there being no report of the appearance of $18 iron in this market. Prices on low phosphorus iron are slightly easier, especially for shipment to points outside of the sellers' immediate territory. The sale of 500 tons of copper bearing iron to a southern Ohio consumer is reported at $28, or $2 a ton below the regular quotation. It is reported that English low phosphorus iron is being offered in New York at $31. Under new freight rates the Birmingham rate on Southern pig iron is reduced from $6.67 to $6 for shipment to Cleveland and other northern Ohio points, including Akron, Canton, Massillon and Mansfield. The rate on Ohio

silvery iron from the Jackson district has been reduced from $3.36 to $3.02 and the local switching charge in Cleveland from 56c. to 50c. Freight rate changes and price changes due to revised freight rates are shown below.

Quotations below are f.o.b. local furnace for Northern foundry iron, not including a 50c. switching charge. Other quotations except basic and low phosphorus are delivered Cleveland, being based on a $3.02 rate from Jackson and a $6 rate from Birmingham:

Basic, Valley furnace	$25.00
Northern No. 2 fdy., sil. 1.75 to 2.25	$23.00 to 24.00
Southern fdy., sil. 1.75 to 2.25	24.50
Ohio silvery, sil. 8 per cent	33.52
Standard low phos., Valley furnace	33.00 to 34.00

Ferroalloys.—English ferromanganese for July shipment is being offered at $70, an advance of $2.50, the price evidently being marked up because buyers are assured delivery before a tariff advance.

Finished Material.—The market continues fairly active and prices still show an upward tendency. On structural material and plates, 1.70c. apparently is now the minimum quotation. On steel bars the 1.60c. price has not entirely disappeared. A Buffalo district mill has advanced its price $2 a ton on steel bars and structural material to 1.80c. for the former and 1.90c. for the latter. Quotations on heavy plates range up to 2c. and on the light plates up to 2.10c. Automobile and parts manufacturers continue to buy steel, although delivery on some of the orders now being placed cannot be made before about Nov. 15. Reeves Brothers, Alliance, Ohio, have taken oil tanks for the Magnolia Refining Co. requiring 1200 tons of plates which will be furnished by the Midvale Steel & Ordnance Co. The Lima Locomotive Corporation has taken 14 locomotives for the Nickel Plate Railroad. The Community Traction Co., Toledo, has placed 500 tons of steel rails with the Lackawanna Steel Co. Independent mills have made the 2½c. price reduction on fence. In the structural field a large amount of work continues to come out.

Sheets.—Consumers are crowding the mills for deliveries and some orders are being booked for September shipment at 2.60c. for blue annealed, 3.40c. for black and 4.40c. for galvanized.

Warehouse Business.—The demand continues heavy. So far the reduction in freight rates has not resulted in any reductions in warehouse prices.

Jobbers quote steel bars, 2.41c.; plates and structural shapes, 2.51c.; No. 9 galvanized wire, 3c.; No. 9 annealed wire, 2.50c.; No. 28 black sheets, 3.90c. to 4c.; No. 28 galvanized sheets, 4.90c. to 5c.; No. 10 blue annealed sheets, 3.25c. to 3.46c.; hoops and bands, 3.06c.; cold-rolled rounds, 3.20c.; flats, squares and hexagons, 3.70c.

Reinforcing Bars.—Prices are firm at 1.70c. Buffalo has taken bids for a filtration plant requiring 3500 tons. The Franklin Steel Works has taken 400 tons for a warehouse for the Hardware & Supply Co., Akron. The American Construction Co. is low bidder for the general contract for a highway bridge at Schenectady, N. Y., requiring 1000 tons. The Central States Engineering & Construction Co., Cleveland, is low bidder for the West Seventy-third Street Bridge, Cleveland, requiring 270 tons.

Bolts, Nuts and Rivets.—Bolt and nut specifications have been very heavy, consumers taking the full amount due on low-priced contracts that expired July 1. Considerable new business is pending. Many rivet contracts are being closed for the third quarter at regular prices, although there are occasional reports of concessions.

Semi-finished Steel.—A local mill during the week sold several lots of sheet bars, billets and slabs aggregating 5000 tons at $35, Cleveland. A northern Ohio drop forge shop is inquiring for 2000 tons of forging billets. Small lot sales are reported at $42, Pittsburgh.

Coke.—With the withdrawal of one producer there is almost no Connellsville foundry coke being offered in this market. Wise County coke is available at $7 to $7.50. The demand has increased owing to the fact that stocks of many foundries have become low.

Old Material.—The market shows very little life and is weak. There is no demand for either Cleveland or Valley mills for scrap, but there is expectation of an improvement after the holidays. Heavy melting steel is quoted at $17 to $17.50 for Youngstown delivery, or 50c. below recent price. A pipe foundry, at Newcomerstown, Ohio, is reported to have purchased a round lot of machinery and railroad cast scrap, and a dealer is inquiring for scrap to fill this contract at $19, delivered. The New York Central and the Big Four railroads received bids to-day on unspecified tonnages. With the rate revision, the freight rate on scrap from Cleveland to Youngstown, Warren and other Valley points and to Canton has been reduced from $2.10 to $1.89 per ton.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel	$15.25 to $15.50
Steel rails, under 3 ft	15.75 to 16.00
Steel rails, rerolling	16.00 to 16.50
Iron rails	14.00 to 15.00
Iron car axles	18.00 to 19.00
Low phosphorus melting	16.00 to 16.25
Cast borings	12.50 to 12.75
Machine shop turnings	11.50 to 12.00
Mixed borings and short turnings	12.50 to 12.75
Compressed steel	12.85 to 13.25
Railroad wrought	14.00 to 14.50
Railroad malleable	15.50 to 16.00
Light bundled sheet stampings	10.00 to 10.25
Steel axle turnings	13.00 to 13.50
No. 1 cast	17.00 to 17.50
No. 1 busheling	11.25 to 11.75
Drop forge flashings over 10 in	11.00 to 11.50
Drop forge flashings under 10 in	11.25 to 11.75
Railroad grate bars	14.00 to 14.50
Stove plate	14.00 to 14.50
Pipes and flues	11.00 to 11.50

Cincinnati

Good Buying of Pig Iron in Prospect—Present Demand Fair

CINCINNATI, July 3.

Pig Iron.—Fair activity was recorded in the market during the week, and while the inquiry is light, the indications are that some good buying will be seen during the next few weeks. A Southern furnace interest booked approximately 5000 tons during the week at prices ranging from $18 to $18.50, and an attractive tonnage can still be booked at the lower figure. Included in this amount was a sale of 1000 tons to a Kentucky melter, and approximately 500 tons for shipment to Canada. The Louisville & Nashville Railroad bought approximately 1000 tons of various grades, paying $18 to $18.50 for foundry irons, and $31, Southern furnace, for charcoal. Northern irons were more active, and we note a sale of 500 tons to a central Ohio melter at $24, Ironton base, an advance of 50c. A number of smaller sales of foundry and malleable grades were booked at the same figure. A Michigan melter took 1500 tons of silvery for third quarter shipment at the schedule, and a nearby melter 500 tons of Valley foundry at $24, furnace. Inquiries for 1000 and 600 tons respectively of malleable for shipment to Indiana and Illinois melters during the third quarter are the only ones of size before the trade. There is also an inquiry for 1000 tons of Bessemer from outside the district. Furnaces report shipping instructions received on Monday for large tonnages of iron, melters being anxious to take advantage of the new freight rates, and also to get in a supply of iron in case railroad traffic is curtailed by strikes.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$22.05
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	22.55
Ohio silvery, 8 per cent	34.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	26.27
Basic Northern	27.27
Malleable	26.27

Coke.—The demand for foundry and domestic coke is showing a steady gain, and contracts for last half are being negotiated at open prices. The price situation is firm, but unchanged from last week.

Finished Material.—While the number of orders for finished material has shown the customary falling off at this season of the year, specifications on contracts are coming in at a highly satisfactory rate. There were no large orders placed during the week and the inquiries consisted principally of lots under 100 tons. It is expected, however, that a number of inquiries for third quarter delivery will be put out during the present week and that some now before the trade will be

closed. The demand for sheets continues heavy, most of the inquiries, however, being for earliest possible delivery. On all finished products, deliveries are running from 8 to 10 weeks, although plates are available for six weeks' delivery from some mills. Prices are showing considerable strength and several independent mills have moved up to 1.80c. on bars, shapes and plates. Very little is now heard of the 1.60c. price and 1.70c. appears to be the minimum for any reasonable delivery. On sheets the spread ranges from 2.40c. to 2.60c. on blue annealed; 3.15c. to 3.40c. on black; 4.15c. to 4.40c. on galvanized; and 4.50c. to 5c. on automobile body sheets. On wire products it is rumored that nails will shortly be advanced to $2.50 per keg. Some orders have been booked by independent mills at $2.45, base. Readjustment of discounts on woven wire fencing were made by some manufacturers during the past week, but the price situation was hardly affected thereby. In the structural field a number of projects involving considerable tonnages of reinforcing bars are expected to come out within the next week or so. Two new inquiries were issued for steel buildings, but only one of consequence was made. A number of fair-sized awards will likely be made this week.

Warehouse Business.—Jobbers report a very good week and with mills getting further behind on deliveries, are looking forward to continued good business. Prices are very firm, and while it was expected advances would be made of approximately $2 a ton, these have not developed as yet.

Jobbers quote: Iron and steel bars, 2.75c. base; hoops, 3.60c.; bands, 3.35c. base; shapes and plates, 2.85c. base; reinforcing bars, 2.82½c. base; cold-rolled rounds, 3.35c. base; flats, squares and hexagons, 3.85c. base; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, 4.50c.; No. 28 galvanized sheets, 5.50c.; No. 9 annealed wire, $2.70 per 100 lb.; common wire nails, $2.85 per keg, base.

Old Material.—The local scrap market continues inactive, but there is a good demand for blast furnace scrap for shipment out of the district. Steel mill grades and cast scrap are quiet. Dealers are marking time, and are not actively buying or selling. Prices, while inclined to be somewhat soft, are unchanged in the absence of trading of consequence.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel	$15.25 to $15.50
Steel rails, under 3 ft.	15.75 to 16.00
Steel rails, rerolling	16.00 to 16.50
Iron rails	14.00 to 15.00
Iron car axles	18.00 to 19.00
Low phosphorus melting	16.00 to 16.25
Cast borings	12.50 to 12.75
Machine shop turnings	11.50 to 12.00
Mixed borings and short turnings	12.50 to 12.75
Compressed steel	12.85 to 13.25
Railroad wrought	14.00 to 14.50
Railroad malleable	15.50 to 16.00
Light bundled sheet stampings	10.00 to 10.25
Steel axle turnings	13.00 to 13.50
No. 1 cast	17.00 to 17.50
No. 1 busheling	11.25 to 11.75
Drop forge flashings over 10 in.	11.00 to 11.50
Drop forge flashings under 10 in.	11.25 to 11.75
Railroad grate bars	14.00 to 14.50
Stove plate	14.00 to 14.50
Pipes and flues	11.00 to 11.50

San Francisco

SAN FRANCISCO, June 28.

Pig Iron.—New business in pig iron has been lighter during the past two weeks, probably due to the liberal buying of the preceding few weeks. Consumers, for the most part, are well supplied for current needs, and with the more apparent settling of prices, there is not the same amount of purchasing for future requirements. An Oakland interest has just taken 500 tons of English material; while the price is not divulged, it is understood to be around $30, delivered. Conditions in the foundry trade appear to be improving, as indicated by the gradual increase in pig iron consumption, and manufacturers likewise are feeling the steady expansion of activities.

Cast Iron Pipe.—A satisfactory condition prevails on the Coast, but no very large volume of business seems to be offering at present. There are a few good-sized prospects, almost exclusively from municipal sources, one of the best of which is an inquiry from Monterey Park for 1800 tons of 4-12-in. material. Los Angeles is in the market for 675 tons of 24-in. and a considerable volume of smaller tonnages. Glendale has just closed for 700 tons. Private contracts are said to be rather light at present, and the market inclined to be slow. Prices are maintaining the increase recorded a short time ago, being firm at approximately $54, delivered. Soil pipe continues scarce, and manufacturers are showing no disposition to accept orders other than those subject to the mill's delivery, the outer limit of which is generally set at about eight weeks. This inability of mills to meet the demand is accompanied by the lack of an adequate number of freighters in the intercoastal service, which makes it difficult to handle the tonnage offered. It is expected, however, that this latter condition will be relieved in about two months. The active demand for plumbers' brass goods likewise is tending to strengthen that market.

Finished Iron and Steel.—The expansion of building and construction operations, observed several weeks ago, continues, and the general opinion appears to be that the market is giving evidence of stability, favorable to a steady buying demand. No great change in prices of the heavy materials is apparent, but the levels recently reached are being held. Demand is diversified, the greater volume comprising the smaller tonnages for stock and shop needs. Oil well operations in the South are prevailingly active. One of the best prospects is that for 2080 tons of plates and mixed structural material for storage tanks. There is also an inquiry for from 400 to 500 tons of plates for a pipe line. The contract for 500 tons of rails and fittings for the new dock at San Pedro has been awarded to a local interest. Among the larger jobs in sight around San Francisco are the $2,500,000 11-story commercial hotel and theater building to be constructed at Eighth and Market streets, San Francisco; and the $2,000,000 Athens Athletic Club building, which will be located in Oakland.

Coke.—Approximately the same condition as prevails in pig iron rules in the coke situation. A good, steady business, generally in small lots and carloads, continues. Almost the only single sale of any proportions was that for 500 tons of English coke for a local consumer. There is no apparent change in market values, domestic material being fairly steady at between $8 and $8.50, f.o.b. ovens, for good quality, while foreign brings from $18.50 to $19.50 delivered.

Old Material.—Some improvement in the consumption of scrap, particularly cast scrap, is reported by the larger users. Although many are pretty well stocked for immediate needs, a perceptible increase in the weekly volume of buying is observed, which is taken by the trade to indicate a gradual recovery in this market. Prices appear firm at $10 a gross ton for heavy melting, since buyers experience difficulty in purchasing for less, and cast iron scrap ranges from about $21 to $22, delivered at consumers' works. Recently some holders have been selling for Japanese account considerable amounts of scrap from the cruiser Brooklyn, which has been dismantled, perhaps 2000 tons in all. The Pacific Coast Steel Co. is now operating two open-hearth furnaces out of six. For many months it was operating only one.

Trade Changes

The Wilson Welder & Metals Co., Inc., 132 King Street, New York, recently appointed the King-Knight Co., Underwood Building, San Francisco, exclusive representative in central and northern California for Wilson Plastic-arc welding machines and Wilson "COLOR-TIPT" metals.

The American Sheet and Tin Plate Co. is now located in its new office in the Empire Building, 71 Broadway, New York. E. E. Winckler is manager of sales.

The Turbine Air Tool Co., Cleveland, has moved its executive offices from 710 Huron Road to 301 Chamber of Commerce Building.

The Hampden Corundum Wheel Co., Springfield, Mass., has changed its name to Hampden Grinding Wheel Co.

HIGH COAL PRICES

Steel Companies Buying with More Caution in Mahoning Valley

YOUNGSTOWN, July 3.—One Valley independent which predicted a $37.50 price on sheet bars for August and September deliveries has extended the current quotation of $35 to apply on August shipments. Non-integrated sheet makers covered on bar requirements by contract expect the $35 price to apply throughout the third quarter.

Some doubt as to the sufficiency of coal supplies beyond Aug. 1 is now expressed by interests which have heretofore shown no apprehension over the fuel situation. Prices have exhibited a firmer tendency the past week, both for Southern coal suitable for coking and for Pittsburgh district coal.

West Virginia and Kentucky coal, of good grade, is purchasable at $3.50 and likely somewhat less, industrial buyers believe, though some mines in those districts have recently quoted up to $3.75. One of the large Valley buyers, which entered the market extensively shortly following the outbreak of the strike of union miners, has paid an average of $2.35 per ton for an amount ranging up to 2500 carloads. The bulk of this coal came from the Kentucky field.

In the Pittsburgh district, operators are asking prices ranging up to $4.50 and $5, and the quality in some cases is not so good as the southern coal.

Owing to susceptibility of the price situation to demand, steel plants are buying with more caution and are sounding the market more carefully.

The Trumbull Steel Co., Youngstown Sheet & Tube Co. and Republic Iron & Steel Co. are operating their own mines in Pennsylvania in a small way, the largest tonnage being produced by the Trumbull company. No steps have yet been taken by the Brier Hill Steel Co. for resumption of its mines in Pennsylvania.

Diversion of coal to the lakes for Northwest consignment will have the usual effect of contracting supplies which would otherwise be available for Middle West industrial consumption, l rge interests point out. Pressure in this respect is likely to be more pronounced this year in view of disturbed working conditions in both the union and non-union fields. For this reason, industrial buyers beileve it will be more difficult to obtain adequate supplies a month hence.

Labor Causes Anxiety

The labor situation is likewise causing some anxiety, and Valley independents are joining in the movement to seek modification of the existing immigration laws which greatly restrict the number of immigrants to be admitted into this country in 1922 and 1923. In late years common labor in many of the steel plants has been recruited to a large degree from immigrants coming from Hungary, Czecho-Slovakia, Jugoslavia and Poland. Restriction on immigration from these countries has cut into the common labor supply of the larger steel employers, a situation looming more serious as operations approach normal.

Mid-summer weather is likewise cutting into hot mill production. A Youngstown independent which had 15 mills scheduled last week, was compelled to reduce the number to 12 before the end of the week, because workmen failed to report and it was unable to assemble full mill crews.

Sheet Prices

Sheet prices are reaching more stable levels in a general way and the higher range which recently applied, namely 2.60c. for blue annealed, 3.40c. for black and 4.40c. for galvanized is disappearing. One of the principal Valley interests, in fact, is accepting tonnage at the levels of the leading interest, 2.40c., 3.15c. and 4.15c. respectively for the three grades. Some slack in urgency of demand has likewise been partially responsible for this situation. Galvanized grades are in strongest demand at this time, particularly for roofing purposes, and several interests are unable to give shipments under six weeks.

The principal Valley producer of full finished stock is virtually out of the market, capacity being occupied in excess of two to three months ahead on orders from its regular customers, chiefly automobile and body makers. The 4.75c. price is applying on all current No. 22 gage auto body stock, and is characterized as very firm.

Active Demand For Pipe

Pipe requirements continue in unabated volume, both for large and small sizes, jobbers being active factors in the market. Resumption of the Bessemer department July 5 of the Republic Iron & Steel Co. relieves the pressure for Bessemer steel, and will be followed by an increase in the number of active pipe mills operated by the company, from five to six. Demand has warranted production from the entire group of pipe furnaces, but has been held in check by shortage of Bessemer steel, required especially for buttweld sizes of tubes.

Active demand for steel bars, exceeding supply, is manifest. In this district the minimum price is now 1.75c., as compared with a recent minimum of 1.70c.

Valley pig iron capacity is now occupied at 75 per cent., only the 18 largest and most efficient blast furnaces of the 27, pouring. This enlargement in production is relieving some of the pressure which existed for a time in the iron market, and deviations from the $25 level for basic iron are occasionally noted. This price, however, still represents the market, say producers, who declare costs of production warrant maintenance of this quotation. It compares with a low of $17.75 several months ago.

Seven Furnaces Blown In

Since April 1, seven blast furnaces have been blown in this territory requiring fully 5000 tons of coal daily for their maintenance. In addition, rolling mill schedules have been expanded, creating enlarged demands for coal. Makers appear covered until Aug. 1 as a general rule. If coal costs are still further increased after that date, because of accumulated demands, they will be reflected in higher steel prices, say the independents.

Valley interests are endeavoring to encourage trade by naming fair prices, believing that quotations which are too high will discourage buying and react disadvantageously. Higher prices now prevailing, they point out, as compared with two months ago, are largely due to advanced coal, iron and scrap costs.

Scrap metals have sagged somewhat the past ten days. Dealers have been offering heavy melting at $18, which compares with a recent high of $19. One interest, in fact, has been getting some tonnage under contract at $17, though the seller has been making strenuous efforts to annul the agreement. Compressed sheet scrap has been sold at $16.40.

Some surplus wire rod tonnage has been offered by the Youngstown Sheet & Tube Co., but prices are being quoted only on a definite bid for tonnage, and are likely higher than $40.

Algoma Rail Mill Gets 48,000-Ton Order—Resumes Operation

The Algoma Steel Corporation's rail mill at Saulte Ste. Marie, Ont., resumed operations on full time Monday, July 3, the company having just closed a contract with the Canadian Pacific Railroad for 48,000 tons of heavy rails. President Franz says that Canadian business is improving steadily and he believes the plant will be kept running from now on.

Steel of not over 0.15 per cent carbon and minimum tensile strength of 47,000 lb. per sq. in. and that of not over 0.20 per cent carbon and minimum tensile strength of 52,000 lb. per sq. in. are satisfactory for forge welding of pipe lines, penstocks, tank-car work and similar construction, according to Frank N. Speller, metallurgical engineer, National Tube Co., Pittsburgh, in a paper read before the American Society of Mechanical Engineers.

FABRICATED STEEL BUSINESS

Bridge and Building Awards and Tonnages Pending at Leading Centers

Awards for fabricated steel work for the past week include the following:

Michigan Central Railroad bridge at Niagara Falls, N. Y., 8,000 tons; American Bridge Co., low bidder, but contract not yet awarded.

Building for Beattie Mfg. Co., Little Falls, N. J., 250 tons, to J. E. Brooks Co.

Two bridges for the Baltimore & Ohio Railroad, 400 tons, to Fort Pitt Bridge Works.

Lincoln Life Insurance Building, Fort Wayne, Ind., 1,000 tons, to Lackawanna Bridge Works Corporation.

Bridge over Gunpowder River, Baltimore, Md., to McLean Construction Co.,; Second-hand material to be furnished.

Bartlett-Hayward Co., Baltimore, Md., 900 tons of I-bars, to American Bridge Co.

Tomlinson bridge at New Haven, Conn., 1,400 tons, to Phoenix Bridge Works.

Bigelow-Hartford Carpet Co., Thompsonville, Conn., 300 tons, to American Bridge Co.

Telephone Exchange Building, Brooklyn, 3,000 tons; general erection contract to Eidlitz & Ross; steel to be fabricated by Bethlehem Steel Bridge Corporation.

Missouri, Kansas & Texas Railway of Texas, locomotive repair shop, Waco, Tex., 1,400 tons, to Mt. Vernon Bridge Co.

Missouri Pacific Railroad, bridge over Kaw River, Kansas City, 501 tons, to King Bridge Co.

Missouri Pacific Railroad, two 35-ft, girder spans and one 90-ft. through plate girder span for bridge No. 113, Joplin division, 127 tons, to American Bridge Co.

Federal Ice & Cold Storage Co., St. Louis, 169 tons, to Mississippi Valley Structural Steel Co.

Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich., 750 tons, to American Bridge Co.

Marland Refining Co., Oklahoma City, Okla., 20 small tanks, 600 tons, to Chicago Bridge & Iron Works.

Pantlind Hotel, Grand Rapids, Mich., addition, 300 tons, to Lackawanna Bridge Works Corporation.

Hayes Office Building, Erie, Pa., 600 tons, to Lackawanna Bridge Works Corporation.

Masonic Temple, Binghamton, N. Y., 300 tons, to Lackawanna Bridge Works Corporation.

First National Bank, Ashland, Ky., 1,500 tons, to Fort Pitt Bridge Co.

Nash Motor Co., new body and sheet metal shop, 200 tons, additional, (original letting, 400 tons), to Worden-Allen Co., Milwaukee.

Warehouse for Eggleston Brothers, Long Island City, N. Y., 300 tons, to Jones & Laughlin Steel Co.

High tension transmission towers for Ohio Public Service Corporation, 3500 tons, to American Bridge Co.

Structural Projects Pending

Inquiries for fabricated steel work which may be added to lists of pending projects include the following:

Masonic Temple, Paterson, N. J., 400 tons.

Sterling Hall of Medicine, New Haven, Conn., 600 tons.

Emerson Building, 1431 Broadway, New York, 400 tons.

Repairs to Williamsburg bridge, New York, 700 tons.

National Biscuit Co., three buildings, at Cincinnati, Philadelphia and Buffalo, 300 tons.

Long Island Railroad, crane runway, 400 tons.

Citizens Hotel, Charlotte, N. C., 700 tons; bids close July 7.

Federal Reserve Bank, St. Louis, 370 tons.

Car dumper for Ford Motor Co., Detroit, 725 tons.

Foundation Co., stock house, Cerveceria Modelo S. A., Mexico City, Mexico, 425 tons.

Johnson Building, Knoxville, Tenn., 200 tons, bids in.

Caldwell Building, Nashville, Tenn., 300 tons, bids in.

Office building 1200 Washington Boulevard, Detroit, 1240 tons.

Car shops, Erie Railroad, Hornell, N. Y., 900 tons, Bates & Rogers, Chicago, general contractors.

Methodist Episcopal church house, Champaign, Ill., 250 tons.

Painter Building, Cleveland, 170 tons, bids taken.

Standard Envelope Co., Cleveland, 200 tons, bids taken.

Cleveland Machine Co., Cleveland factory, 250 tons.

Highway bridge, Schenectady, N. Y., 500 tons, American Construction Co., Cleveland, low bidder.

West Technical High School, Cleveland, 450 tons, bids taken.

Mirimar Hotel, Cleveland, 1500 tons, previously reported as 700 tons.

Refractories Prices Have Been Advanced

PITTSBURGH, July 3.—Increases in prices of fire clay brick and other refractories recently were announced by manufacturers in the various producing districts. The advance includes all grades except Birmingham silica brick, which remain at the recent basis of $40 per 1000. Fire clay brick have been advanced $2 per 1000 in all districts, thus establishing a mimimum of $31 per 1000 for high heat duty, Pennsylvania, Kentucky, Illinois and Missouri brick, and of $32 for this grade at Ohio works. The new prices for silica brick represent an advance of $3 per 1000, while there has been a like advance in magnesite brick, $2 a ton in Austrian grain magnesite and $2 a ton in chrome brick.

Advances in magnesite brick and grain magnesite are explained largely by the action of the Senate in connection with the tariff on foreign magnesite, this development having had the effect of stimulating the demand. Demand for fire clay and silica brick has been increasing steadily, following the failure of the coal strike to affect steel plant operations seriously, and in trying to increase production to care for the orders, not a few refractories manufacturers have esperienced labor shortages which have forced increases in wages. Fuel costs also have climbed, whether the manufacturers, as many do, own their own mines, or are dependent upon the open market for supplies. The new prices do not apply on such orders as were on the books of makers prior to the advance which carried a fixed price, and as usual consumers were given the opportunity to place orders before the increase became effective.

We quote per 1000 f.o.b. works:

Fire Clay	High Duty	Moderate Duty
Pennsylvania	$34.00 to $36.00	$32.00 to $34.00
Ohio	32.00 to 34.00	30.00 to 32.00
Kentucky	34.00 to 37.00	32.00 to 34.00
Illinois	34.00 to 36.00	32.00 to 34.00
Missouri	34.00 to 36.00	30.00 to 34.00
Silica Brick		
Pennsylvania		33.00 to 35.00
Chicago		38.00 to 41.00
Birmingham		40.00
Standard size per net ton (f.o.b. Baltimore and Chester, Pa.)		56.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)		30.00
Chrome Brick		
Standard size, per net ton		42.00

Plant Operations

The Ryan Foundry Co., Lansing, Mich., has taken an order for castings for 100,000 motors for the Grant Motor Co., same city, and is arranging for immediate increased production.

The American Steel & Wire Co., Anderson, Ind., is advancing production in different departments of its local mill. The wire nail department has booked some heavy orders for foreign shipment.

The Packard Motor Car Co., Detroit, has adopted a production schedule of 2,000 single-six automobiles a month, doubling the monthly output heretofore operative since last April, when this model car was announced. During the past few weeks, the company has made the heaviest shipments in its history.

The Texas & Pacific Railroad Co. is increasing operations at its repair shops at Marshall, Tex., and about 200 men will be added to the working force at once, making a total of 600 workers now on the payroll.

The New Era Spring & Specialty Co., Grand Rapids, Mich., has adopted a night shift operation in addition to the regular day operating schedule. Orders now being received are in excess of production.

The Cadillac Malleable Iron Co., Cadillac, Mich., is arranging for the early operation of its new local foundry now nearing completion. It is expected to give employment to about 100 men at the plant.

The Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., is increasing production at its plant, with operating schedule close to plant capacity. The wages of all employees have been advanced, effective July 10.

The Moon Motor Car Co., St. Louis, has adopted a production schedule call for 1,000 complete cars during each month of July and August.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Plates

Sheared, tank quality, base, per lb.....1.70c. to 1.80c.

Structural Material

Beams, channels, etc.....1.70c. to 1.80c.

Iron and Steel Bars

Soft steel bars, base, per lb.....1.70c. to 1.80c.
Refined iron bars, base per lb.....2.20c.

Hot-Rolled Flats

Hoops, base, per lb.....2.50c. to 2.75c.
Bands, base, per lb.....2.50c. to 2.75c.
Strips, base, per lb.....2.50c. to 2.75c.

Cold-Finished Steels

Bars and shafting, base, per lb.....2.10c.
Strips, base, per lb.....4.00c.

Wire Products

Nails, base, per keg.....$2.40 to $2.50
Bright plain wire, base, per 100 lb..... 2.25
Annealed fence wire, base, per 100 lb..... 2.25
Galvanized wire, base, per 100 lb..... 2.75
Galvanized barbed, base, per 100 lb..... 3.05 to 3.15
Galvanized staples, base, per keg..... 3.05 to 3.15
Painted barbed wire, base, per 100 lb..... 2.55 to 2.65
Polished staples, base per keg..... 2.55 to 2.65
Cement coated nails, base, per count keg..... 1.90 to 2.00
Woven fence, carloads.....73 per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads,
60, 10 and 10 per cent off list
Machine bolts, small, cut threads....60 and 10 per cent off list
Machine bolts, larger and longer.....60 and 10 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads. 60 and 10 per cent off list
Cut threads .....60 per cent off list
Longer and larger sizes .....60 per cent off list
Lag bolts .....60, 10 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.:
Smaller and shorter .....50 and 10 per cent off list
Larger and longer sizes.....50 and 10 per cent off list
Hot pressed square or hex. blank nuts.....$4.50 off list
Hot pressed nuts, tapped .....$4.50 off list
C.p.c. and t. sq. or hex. nuts, blank.....$4.50 off list
C.p.c. and t. sq. or hex. nuts, tapped.....$4.50 off list
Semi-finished hex. nuts:
9/16 in. and smaller, U. S. S.....80 and10 per cent off list
⅝ in. and larger, U. S. S...75 and 10 and 10 per cent off list
Small sizes, S. A. E.....80, 10 and 10 per cent off list
S. A. E. ⅝ in. and larger...75 and 10 and 10 per cent off list
Stove bolts in packages.....80 and 5 per cent off list
Stove bolts in bulk.....80, 5 and 2½ per cent off list
Tire bolts .....65 per cent off list
Track bolts in carloads.....3.00c. to 3.25c. base
Track bolts, less than 200 kegs.....3.50c. to 3.75c. base

Cap and Set Screws

Milled square and hex. head cap screws,
75 and 10 per cent off list
Milled set screws.....75 per cent off list
Upset cap screws.....80 per cent off list
Upset set screws.....80 and 5 per cent off list

Rivets

Large structural and ship rivets, base per 100 lb.....$2.40
Large boiler rivets, base per 100 lb..... 2.50
Small rivets .....70 and 5 per cent off list

Track Equipment

Spikes, 9/16 in. and larger, base, per 100 lb....$2.25 to $2.35
Spikes, ½ in. and smaller, base, per 100 lb..... 2.50
Spikes, boat and barge, base, per 100 lb..... 2.50
Track bolts, base, per 100 lb..... 3.25
Tie plates, per 100 lb.....$1.75 to 2.00
Angle bars, base, per 100 lb..... 2.40

Welded Pipe

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	54½	28	¼ to ⅜.....	+ 3½	+22½
¼ to ⅜.....	60	33½	½	36½	18½
½	65	50½	¾	42½	27½
¾	69	56½	1 to 1½.....	44½	29½
1 to 3.....	71	58½			

Lap Weld

2	64	51½	2	39½	25½
2½ to 6.....	68	55½	2½ to 6.....	42½	29½
7 to 8.....	65	51½	7 to 12.....	40½	27½
9 to 12.....	64	50½			

Butt Weld, extra strong, plain ends

⅛	50½	33	¼ to ⅜.....+	4½	+37½
¼ to ⅜.....	56	38½	½	35½	23½
½	62	50½	¾	42½	28½
¾	67	55½	1 to 1½.....	44½	30½
1 to 1½.....	69	57½			
2 to 3.....	70	58½			

Lap Weld, extra strong, plain ends

2	62	50½	2	40½	27½
2½ to 4.....	66	54½	2½ to 4.....	43½	31½
4½ to 6.....	65	53½	4½ to 6.....	42½	30½
7 to 8.....	61	47½	7 to 8.....	35½	23½
9 to 12.....	55	41½	9 to 12	30½	18½

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 and 2½ per cent.

Boiler Tubes

Lap Welded Steel		*Charcoal Iron*	
1¾ in.	26½	1½ in.	5
2 to 2¼ in.....	41	1¾ to 1⅞ in.....	15
2½ to 3 in.....	52	2 to 2¼ in.....	25
3¼ to 13 in.....	57	2½ to 3 in.....	30
		3¼ to 4½ in.....	32

To large buyers of steel tubes a supplementary discount of 5 per cent is allowed.

Standard Commercial Seamless Boiler Tubes

Discounts on cold-drawn or hot-rolled tubes in carload lots, f.o.b. Pittsburgh, follow:

1 in.	60	2½ and 2¾ in.....	43
1¼ and 1½ in.....	52	3 in.	47
1¾ in.	36	3¼ to 4 in.....	52
2 and 2¼ in.....	39	4½ in. to 5 in.....	44

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Tin Plate

Standard cokes, per base box.....$4.75

Terne Plate

(Per package, 200-lb.)

8-lb. coating	$9.30	25-lb. coating I. C.....$14.25	
8-lb. coating I. C.....	9.60	30-lb. coating I. C.....	15.25
15-lb. coating I. C.....	11.80	35-lb. coating I. C.....	16.25
20-lb. coating I. C.....	13.00	40-lb. coating I. C.....	17.25

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....2.40c. to 2.60c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.15c. to 3.40c.

Galvanized

No. 28 (base), per lb.....4.15c. to 4.40c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.15c. to 3.40c.

Manufacturers have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic.	$0.325	Buffalo	$0.265	St. Louis	0.43
Philadelphia, export...	0.265	Cleveland	0.215	Kansas City	$0.735
Baltimore, domestic...	0.315	Cleveland, Youngstown		Kansas City (pipe)...	0.705
Baltimore, export.....	0.255	Comb.	0.19	St. Paul	0.595
New York, domestic...	0.34	Detroit	0.295	Omaha	0.735
New York, export.....	0.285	Cincinnati	0.295	Omaha (pipe)	0.705
Boston, domestic	0.365	Indianapolis	0.31	Denver	1.275
Boston, export	0.285	Chicago	0.34	Denver (pipe)	1.215
				Pacific Coast	$1.50
				Pac. Coast, ship plates	1.20
				Birmingham	0.69
				Memphis	0.385
				Jacksonville, all rail..	0.50
				Jacksonville, rail and water	0.415
				New Orleans	0.515

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 55c.; ship plates, 75c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 75c.; sheets and tin plates, 60c. to 75c.; rods, wire rope, cable and strands, $1; wire fencing, netting and stretcher, 75c.; pipe, not over 8 in. in diameter, 75c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

PERSONAL

William J. Gruss, who has been the head of the pig iron sales department of Pickands, Mather & Co., Cleveland, since 1913, has tendered his resignation, effective July 10, to become manager of sales of the Gartland-Haswell-Rentschler interests, operating 12 or more gray iron foundries in the Central West. He will have his headquarters in Dayton, Ohio, and will assume his new duties Aug. 1. Mr. Gruss is widely known among the pig iron manufacturers of the country and also has an extensive acquaintance with the foundry trade, and is qualified for his new position by his many years' experience in the pig iron business. He was born in Salem, Ohio, in 1878, and has been with Pickands, Mather & Co. over 28 years, the Cleveland office of that firm being his first place of employment. There he worked up through successive stages until he was placed in an important executive position. He is a member of the American Iron and Steel Institute and of the Union Club, Cleveland Athletic Club, and Cleveland Chamber of Commerce. Mr. Gruss will be succeeded by George W. Striebing, who has been connected with the pig iron sales and ore sales departments of the Pickands, Mather & Co. for 11 years.

WILLIAM J. GRUSS

Lewis T. Rights, contracting manager at New York for the Shoemaker-Satterthwait Bridge Co., sailed July 1 for a two months' trip in England, France, Belgium and Switzerland.

Henry Held, secretary and treasurer Rundle Mfg. Co., Milwaukee, manufacturer of bathtubs and enameled sanitary ware, has been elected president and treasurer. He succeeds the late Robert T. Hazelwood. L. R. Kinnear has been elected vice-president; A. C. Held, secretary, and H. F. Galdammer, assistant treasurer.

J. C. Gore, for 12 years with Domhoff & Joyce Co., pig iron and coke brokers, has been appointed resident manager at Chicago, vice J. P. Crowley, resigned. For the past nine years Mr. Gore has been in the Indianapolis office of the company. He will be assisted at Chicago by L. H. Hoerdt, formerly of the St. Louis office.

Frederick M. Spencer, superintendent Landers, Frary & Clark, Meriden, Conn., cutlery plant, has resigned to associate himself with the International Silver Co.

C. F. Ford, who for the past several years has been with the Chicago Pulley & Shafting Co., has recently joined the engineering sales forces of W. A. Jones Foundry & Machine Co., manufacturer of speed reducers and power transmitting machinery, Chicago. In the near future, Mr. Ford will be located in Minneapolis, Minn., as manager of the Jones branch there. Several years ago, when the Jones company was in its old plant at North Avenue and Noble Street, Chicago, Mr. Ford was transmission engineer and acted in that capacity over an extended period.

S. Glen Vinson, secretary and general manager Ideal Electric & Mfg. Co., Mansfield, Ohio, left April 15 for the Orient, where he will make a survey of business conditions. Mr. Vinson will include on this trip all the larger cities in Japan, China, Philippine Islands, and India. He expects to return to the States about Oct. 1.

Floyd H. Smith, formerly with the Pierce-Arrow Motor Car Co., Buffalo, as director of purchases, has become associated with the Simms Magneto Co., East Orange, N. J., as assistant general manager.

H. E. Cyphers, formerly sales manager of the Brown-Hunkele Corporation, Newark, N. J., is now associated with the McCool-Ellis Co., that city, handling the sales of used machinery, boilers, motors and compressors.

Arthur A. Hammerschlag, president Carnegie Institute of Technology, Pittsburgh, since 1903, has resigned and will become consulting engineer and advisor to corporations, with offices in Pittsburgh and New York.

Charles H. McKnight, who has held the positions of president and chairman of the Carbon Steel Co., Pittsburgh, resigned from the former office at a recent meeting of the board of directors. His successor is C. F. Blue, Jr., who has been vice-president, and Frank C. Neale, president Kittanning Iron & Steel Mfg. Co., controlled by the Carbon Steel Co., and a director of the latter, has been made vice-president, in succession to Mr. Blue.

J. F. Keller, vice-president Keller Mechanical Engraving Co., Brooklyn, has been awarded the Edward Longstreth medal of merit by the Franklin Institute. The award was made in consideration of very substantial improvements and inventions made by Mr. Keller in the art of mechanical die cutting, as represented by his automatic die cutting machine of the reproducing type. In the citation accompanying the presentation, it was stated that "the institute believes that credit should be given Mr. Keller for having met a need for increasing die production and reproduction over that which was possible by the old hand method and skilled operators. His efforts have resulted in easier, quicker and better production by less skillful operators, and a reduction of the costs."

J. F. KELLER

Anson W. Burchard, vice-chairman of the board of directors General Electric Co., has been elected president and chairman of the board International General Electric Co., succeeding Gerard Swope, its former president who was recently chosen president of the G-E company and Charles Neave, former chairman of the I. G. E. company, who has resigned.

P. J. Connor, formerly traveling representative for the International Machine Tool Co., Indianapolis, manufacturer of the Libby turret lathe and who recently resigned from the Essley Machinery Co., Chicago, is now engaged with the Haynes Stellite Co., Chicago, in an engineering capacity with headquarters at New York.

Charles H. Bluske has been appointed Los Angeles district sales manager of the Economy Fuse & Mfg. Co., Chicago, with office at 1304 Maltman Avenue. Mr. Bluske was formerly connected with the Pacific States Electric Co., Los Angeles, and succeeds George L. Davis.

H. F. Hoevel has been appointed manager of the sand blast department of the J. W. Paxson Co., in Philadelphia. He has developed a new line of improved Hoevel-Paxson sand blast machines.

J. Allen Dillon, manager of sales, New York office, Pittsburgh Screw & Bolt Co., accompanied by his wife and son sailed on the Paris from New York July 5, for a six weeks' trip to Europe.

R. D. Shields has been appointed assistant general manager of the Ohio Machine Tool Co., Kenton, Ohio. Mr. Shields has been chief engineer of this company for several years past and will continue in that capacity.

Westinghouse Changes

The following changes in personnel have been announced by the Westinghouse Electric & Mfg. Co.:

L. C. Bullington, who has been assistant to the manager of the power department for several years, has been made assistant manager and will have charge of the general work of the power department. Charles F. Lloyd, formerly manager of the sub-station section, has been made manager of the electric division and R. E. Carothers, formerly manager of the turbine section, has been appointed manager of the steam division. The vacancies have been filled by the elevation of Bruce H. Lytle and D. O. Tylee, the former becoming manager of the sub-station section and the latter manager of the turbine section.

R. B. Mildon has been appointed general manager of the stoker department, with headquarters at South Philadelphia.

G. A. Sacchi, formerly manager of the stoker section, power department, has been appointed manager of stoker sales and will have his headquarters at South Philadelphia.

Edgar Woodrow has been appointed manager of the contract division, stoker repartment.

F. G. Hickling is now manager of the railway division, Pittsburgh district office.

C. C. Curry, formerly branch manager in Minneapolis, has been assigned to special work in connection with the St. Paul Electric Co.

Norman Stewart is branch manager in Minneapolis.

S. R. Shave has been appointed manager of the price section, power and railway departments, East Pittsburgh.

A. Heckman is now works electrical engineer at the East Pittsburgh works of the company.

F. R. Kohnstamm has been appointed acting manager, appliance section, merchandising department and will be located in Mansfield, Ohio.

J. W. Robinson will succeed C. E. Alles as manager, central station division, Chicago office.

H. A. Lynette has been appointed syndicate representative, central station division, Chicago office.

Kentucky Steel & Wire Co.'s Plant

The Kentucky Steel & Wire Co., Louisville, Ky., recently incorporated with a capitalization of $500,000, has purchased property at Thirty-second and Market streets, and has plans prepared for mill buildings to cost with equipment approximately $200,000. Wire nails, barbed wire, staples, galvanized wire nails and bent wire specialties will be manufactured. The company expects to begin manufacturing operations about Sept. 1. A. H. Dillon, formerly connected with the Youngstown Sheet & Tube Co., is president of the company, and associated with him are John R. Humphrey, Lexington, Ky., and Joseph O'Donnell, Louisville.

British Empire Steel Corporation Plans

A newspaper telegram from Montreal says that it is the intention of the British Empire Steel Corporation to spend the sum of $19,000,000 in additions and repairs to the steel plant. It is stated that engineers employed by the corporation are now engaged preparing plans for new open-hearth furnaces and a blooming mill, to cost about $10,000,000. One blast furnace is to be rebuilt and a second one extensively repaired. Other additions and improvements are to be made in the plant, it is said, the whole to cost in the vicinity of the amount above mentioned.

Stockholders of the Sharon Steel Hoop Co., Sharon, Pa., have approved recommendation of directors for an increase in the capitalization from $15,000,000 to $20,000,000. The new authorization will consist of $5,000,000 8 per cent cumulative preferred, convertible into common. It is the intention to issue at once $1,500,000 of the new authorization, this amount having been largely underwritten by shareholders pro rata at par. The new funds will give the company a net working capital of about $3,000,000 and thereby strengthen its position. It has been showing profits on operations for several months, states an official.

Eastern Steel Co. May Purchase Warwick Blast Furnaces

The Eastern Steel Co., Pottsville, Pa., which in January, 1912, leased the blast furnaces of the Warwick Iron & Steel Co., Real Estate Trust Building, Philadelphia, at Pottstown, Pa., for 99 years, is considering exercising an option to purchase the property, but no definite action has been taken.

Under the terms of the lease, the Eastern Steel Co. has the right to purchase the property of the Warwick Iron & Steel Co. at any time within fifteen years from the date of the execution of the lease for $2,000,000, less such payments in dividends as have been made upon the stock, which total $500,000. If the purchase deal goes through, the Eastern Steel Co. plans a new bond issue which probably will be about $4,000,000.

Officers of the Warwick Iron & Steel Co. are: W. S. Pilling, president; G. E. Schlegelmilch, vice-president; H. F. Hallman, secretary and treasurer.

The Eastern Steel Co. also has mills at Pottsville, Pa., for rolling structural shapes. The product of the Warwick Blast furnaces is used both for supplying the company's steel plant and for merchant trade. The annual capacity of these furnaces is 300,000 tons.

Inspection Tour of Steel Corporation Officials

An inspection tour, which is believed to be preliminary to greater use of the upper Ohio River by the United States Steel Corporation subsidiaries, was conducted by officials of the Carnegie Steel Co., June 29. A party of more than 100, including several New York officials of the Corporation, left Pittsburgh on a special train in the morning for Steubenville, Ohio, returning by river barge. Lately the Carnegie Steel Co. has been using the Ohio river between Steubenville and Pittsburgh for the shipment of coke to the Mingo, Ohio, furnaces and in bringing back coal and scrap. It is believed that the Corporation, if it does not go so far as to make distant shipments by the inland waterways as the Jones & Laughlin Steel Co. has been doing since last fall, will put in service additional barges for interplant shipments and for serving customers in and near Pittsburgh who are so situated as to be able to receive such shipments. A plan of this sort was worked out during the railroad transportation snarls two years ago, but was sidetracked when the railroad situation improved.

Thomas Iron Co. Sale Confirmed

The Thomas Iron Co., Hokendauqua, Pa., by W. A. Barrows, Jr., president, announces that the required amount of the Thomas Iron Co. stock has been deposited with Drexel & Co., bankers, Philadelphia, and the Easton Trust Co., Easton, Pa., the agreement to purchase the iron company stock by Drexel & Co. thereby becoming effective.

Stockholders of the Thomas Iron Co. who have not yet deposited their stock can, under the terms of the agreement, do so now and receive prompt payment at $50 per share.

Notwithstanding published reports that Drexel & Co. are acting for the Reading Iron Co., Mr. Barrows states that the agreement of purchase is solely with Drexel & Co. and that the use of other names in this connection has not been officially authorized.

Remington Arms Plant Taken Over

The General Electric Co. has purchased the Remington Arms Co's. plant at Bridgeport, Conn., for a price said to exceed $3,300,000. The transaction was completed last week. The General Electric Co. two years ago leased the Remington plant, with an option to purchase from the Bridgeport Liquidation Co.

NON-FERROUS METALS

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
June	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
28.....	13.75	13.50	30.87½	5.80	5.55	5.62½	5.27½
29.....	13.75	13.50	30.70	5.80	5.55	5.65	5.30
30.....	13.75	13.50	30.87½	5.80	5.55	5.67½	5.32½
July							
1.....	13.75	13.50	....	5.75	5.55	5.70	5.35

*Refinery quotation.

New York

NEW YORK, July 3.

Because of the Independence Day holiday all the markets have virtually been closed since Saturday, July 1, and almost no trading is reported. In the past week the copper and zinc markets have turned stronger, while lead has become slightly easier. The tin market has been stagnant with prices substantially unchanged.

Copper.—Sentiment is generally unanimous that there will be no further recession in the electrolytic copper market for some time and that the undercurrent is essentially strong with the price tendency upward. There is more inquiry for third quarter and last half delivery and metal for July shipment is becoming scarcer. According to some accounts it is difficult to buy electrolytic copper for July or August shipment at 13.75c., delivered, and it is likely that within two or three days the minimum will be 13.87½c. for this position, with the probability that this level will be the minimum for third quarter. Owing to the strong position of the market, consumers are starting to inquire more liberally. The export market is steady and strong. Sales for June are estimated to have been about 80,000,000 lb., which is considerably lower than April or May, but large under the circumstances. Lake copper is quoted at 13.75c. to 14c., delivered.

Copper Averages.—The average price of Lake copper for the month of June, based on daily quotations in THE IRON AGE, was 13.87c. The average price of electrolytic copper was 13.62c., refinery, or 13.87c., delivered.

Tin.—Buying has virtually come to a standstill and the market is stagnant. The bulk of the large consignment of 2500 tons of tin which arrived June 17 on the steamer Knight Templar has been shipped to consumers and any moderate unsold portions are in strong hands. There is also no pressure to sell lots due to arrive and the position of the market is, as the result, satisfactory. With the holiday in the tin market extending from June 30 to Wednesday, July 5, developments have been very few and this situation is accentuated by the fact that the New York Metal Exchange is also closed during this period. Private cables to-day indicate an advance of approximately £2 to £3 per ton over the London quotations prevailing Friday, June 30, which were £152 12s. 6d. for spot standard, £153 12s. 6d for future standard and £155 12s. 6d for spot Straits. On June 29 a little business in Straits tin was done at a range of 30.62½c. to 30.75c., New York. Total arrivals for June are reported as 5580 tons. The deliveries into consumption have been 5130 tons with 2371 tons in stock and landing on June 30. The latter data are larger than the trade expected.

Lead.—The market is quiet with less demand than there was recently and there is a slightly easing in quotations, particularly at St. Louis. At that point the market is quoted at 5.55c., but it is probable that a desirable order could be put through at 5.50c. There are signs also that the outside market and that of the leading interest are virtually the same at New York. Consumption continues very heavy.

Zinc.—Prices have advanced perceptibly in the past week until prime Western for early delivery is now quoted at a minimum of 5.35c., St. Louis, or 5.70c., New York. Consumers have placed fair sized orders recently and dealers are also buying, but producers generally are inclined to revise quotations as far as possible.

Aluminum.—Wholesale lots of virgin metal, 98 to 99 per cent pure, are quoted by the leading interest at 19.10c., f.o.b. plant, with the same grade of imported metal available from dealers from 17.75c. to 18c., duty paid, New York.

Antimony.—The market is quiet and wholesale lots for early delivery are quoted at 5c., New York, duty paid.

Old Metals.—Business has been rather quiet but values continue firm. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	13.50
Copper, heavy and wire	12.75
Copper, light and bottoms	11.00
Heavy machine composition	10.25
Brass, heavy	8.00
Brass, light	6.50
No. 1 red brass or composition turnings	8.75
No. 1 yellow rod brass turnings	7.50
Lead, heavy	4.875
Lead, tea	3.75
Zinc	3.00

Chicago

July 3.—The metals are quiet with copper weaker and zinc higher. The advance in zinc seems to be explained by the disinclination of producers to sell at recent low levels. It is pointed out that zinc ore is nearly as high as when zinc sold for 8c. Copper is very weak and in some cases is being sold at considerable concessions under the nominally quoted market. Old metal prices are unchanged. We quote in carload lots: Lake copper, 13.75c.; tin, 32.50c.; lead, 5.60c.; spelter, 5.40c.; antimony, 7c., in less than carload lots. On old metals we quote. Copper wire, crucible shapes and copper clips, 10.75c.; copper bottoms, 8.75c.; red brass, 8.25c.; yellow brass, 6.75c.; lead pipe, 4.25c.; zinc, 2.75c.; pewter, No. 1, 20c.; tin foil, 22.50c.; block tin, 25c.; all buying prices for less than carload lots.

Traffic Congestion in Non-Union Fields

WASHINGTON, July 4.—Present indications point to a total production of less than 5,300,000 tons of coal during the thirteenth week of the strike, according to the Geological Survey, the output of anthracite being negligible. The decline from the twelfth week, when bituminous production totaled 5,337,000 tons, is attributed to traffic congestion in the non-union fields of southeastern Kentucky and parts of southern West Virginia, which prevailed chiefly on Monday and Tuesday. The present rate of output weekly is from 5,000,000 to 6,000,000 tons below normal.

The thirteenth week opened with production at a high rate. Loading on Monday, June 26, were 16,735 cars, the largest on any Monday since the strike began. Owing to the traffic congestion, production was curtailed and loading fell off 11,000 cars on the two days following, but went up to 16,441 cars on Thursday. The decrease in loading is reported to be due not to scarcity of cars but to inability to move them faster than a certain limit set by the existing yard and track facilities and it is noted that the railroads concerned are making new records in volume of traffic handled.

The number of unbilled cars at the mines continues to steadily decrease and was down to 2190 cars of soft coal on June 29 for a group of 22 of the largest carriers holding about 75 per cent of the total number of unbilled loads. This was the lowest point reached up to that date. On all lines on June 24, the number of unbilled cars of soft coal was 3678.

June cement shipments of the Bessemer Limestone & Cement Co., Youngstown, Ohio, from its Bessemer, Pa., property approximated 150,000 bbl., a new monthly record. The company reports firm demand for cement for building construction and road building. Its fluxstone shipments are likewise expanding as blast furnace operations are enlarged. It supplies fluxstone to stacks in the Mahoning Valley and in the Pittsburgh district.

Machinery Markets and News of the Works

AUTOMOBILE COMPANIES BUY

Ford Motor Co. and the Studebaker Corporation Are Large Purchasers

Manufacturers of Turret Lathes Advance Prices 10 Per Cent—Radial Drills Also Higher

Large automobile production has brought manufacturers into the market for more shop equipment. The Ford Motor Co., Detroit, has placed orders for about $150,000 worth of tools, including a large lathe, die sinking machines, vertical boring mills, etc. It is reported that the Fisher Body Corporation and the Wilson Body Co., Detroit, will be in the market within a month for considerable equipment, mostly woodworking tools. The Studebaker Corporation, South Bend, Ind., has bought some of the tools for which it recently inquired. One purchase of grinding machines totaled about $40,000. The Continental Motors Co., Muskegon, Mich., is buying tools for production of motors for the Star automobile, which will be put on the market by the Durant Motors Co.

The Associated Motor Industries, a new $80,000,000 corporation organized at Dayton, Ohio, which takes in fourteen plants making automobiles, trucks and automobile parts, plans immediate expansion and speeding up of production in all of its units, which gives promise of machine-tool buying from this source.

No buying has been done in Chicago by the railroads whose inquiries for tools have recently been published. It is stated that one or two of the roads will soon purchase a part of their requirements, but no important buying is expected until the strike of railroad shopmen has been settled. The New York Central has purchased several machines.

Municipal buying continues. Joliet, Ill., has bought $25,000 worth of tools, and the Wilmington, Del., fire department has equipped a motor repair shop at a cost of $10,000. The Cleveland Board of Education has received bids on about 30 machines.

Price advances, forecasted by THE IRON AGE a few weeks ago, have been put into effect by a number of manufacturers. The Warner & Swasey Co., Cleveland, announces a 10 per cent advance, effective July 1. Radial drill manufacturers have announced new prices which are from 5 to 7½ per cent higher. Price advances are under consideration by other manufacturers, who say that increasing costs make it imperative that they obtain more money for their products.

New York

NEW YORK, July 3.

The New York Central Railroad has placed orders for an axle lathe, slotter and horizontal boring and drilling machine, but the other machines for which this road recently inquired have not been purchased. The Long Island Railroad has made no purchases against its recent inquiry for about a half dozen machines. The Erie Railroad is reported to have completed its purchase of about 25 tools. It took part new and part used tools.

The McCabe & Sheeran Machinery Corporation, New York, has sold two used Liberty frog and switch planers to the Ramapo Iron Works for its plant at Hillburn, N. Y.

Business in machine tools the past week has been rather quiet, due probably to the holidays this week as well as to the uncertainty regarding the coal situation and the railroad strike. Companies which have sales offices in various centers report that business is considerably better in the Middle West, particularly in the Chicago district, than in the East.

There was great activity in crane purchases the past week in both electric overhead and locomotive cranes. On the whole, the market is greatly improved. One manufacturer of electric hoists reports June as the best month for sales this year and manufacturers of chain blocks also report a heavy month's business in June, numerous dealers having placed orders for chain hoists for stock. Locomotive crane sales are good, although there is still a strong desire on the part of buyers to purchase used cranes when possible. In electric overhead traveling cranes no large orders are pending, but builders are bidding on a number of single cranes and there is reported to be one inquiry in this district for five 5-ton and 10-ton electric cranes.

Among recent sales are: Niles-Bement-Pond Co., two 20-ton electric cranes, 56-ft. 9-in. and 80-ft. spans, three 10-ton, 56-ft. 9-in., 57-ft. and 61-ft. 11-in. spans, two 7-ton, 53-ft. and 61-ft. 11-in. spans and one 5-ton, 27-ft. 3-in. span to the M. W. Kellogg Co., Jersey City, N. J., and a 5-ton, 68-ft. span electric crane to the McIntosh & Seymour Corporation, Auburn, N. Y.; Cleveland Crane & Engineering Co., a 40-ton, 56-ft. span gantry crane to the Phoenix Utility Co., 71 Broadway, New York; Shaw Electric Crane Co., two 3-ton electric cranes and the Chesapeake Iron Works a 10-ton, 28-ft. 4-in. span overhead crane to the Otis Elevator Co., Yonkers, N. Y.; Morgan Engineering Co., a 250-ton overhead traveling crane to the Erie Railroad for Hornell, N. Y., (two 15-ton cranes still pending); Shepard Electric Crane & Hoist Co., nine 1-ton and six ½-ton, "Liftabout" hoists to the Baltimore Car & Foundry Co., for Curtis Bay, Md.; Browning Co., a 20-ton locomotive crane to Isaac Miller's Sons, Lebanon, Pa., a 2-ton locomotive crane to Hurwitz Brothers, Syracuse, N. Y., and two 20-ton locomotive cranes to a Baltimore contractor; Philip T. King, 30 Church Street, New York, a 30-ton, 50-ft. boom used Ohio locomotive crane with 1½-yd. new Hayward bucket to the Girardeau Cement Co., St. Louis, and a 30-ton, 50-ft. boom used Ohio locomotive crane with new Hayward orange-peel bucket to the Atlas Sand Co., Hartford, Conn.; and the Ohio Locomotive Crane Co., a 20-ton, 50-ft. boom locomotive crane to the McDonald Construction Co., Flushing, N. Y.

William Thorpe, 705 Whitlock Avenue, New York, has leased property at the location noted, heretofore occupied by Bjur Brothers, for the establishment of a new plant to manufacture electrically-operated talking machines and parts.

The Buick Motor Co., 1733 Broadway, New York, has awarded contract to the Thompson-Starrett Co., 49 Wall Street, for a six-story service and repair building on Eleventh Avenue, between fifty-fifth and Fifty-sixth Streets, estimated to cost in excess of $200,000. A portion of the building will be used by the Oakland Motor Car Co.

The Orange County Hydro-Electric Corporation, Middletown, N. Y., is disposing of a bond issue of $600,000, a portion of the proceeds to be used for the erection of a hydroelectric generating plant at Mongaup Falls.

The Rathbun & Bird Co., 17 Walker Street, New York, operating a general machine shop, is making inquiries for a vertical milling machine.

The Tunnel Garage, Inc., 3 Charlton Street, New York, has awarded contract to the Ettinger Contracting Co., 44 Court Street, Brooklyn, for a two-story automobile service and repair works, 100 x 200 ft., at 520-28 Broome Street and 55 Thompson Street, to cost about $50,000. G. S. Strivers is president.

The Electric Auto-Lite Co., Poughkeepsie, N. Y., manufacturer of automobile starting and lighting equipment, has been reorganized by Clement O. Miniger and associates,

who recently acquired the local plant, as well as the other factories of the company at Toledo and Fostoria, Ohio. The new company will soon resume operations and has arranged for a bond issue of $3,000,000, a portion of the proceeds to be used for extensions and betterments. Mr. Miniger is president.

The Long Island Railroad Co., Pennsylvania Terminal, New York, is arranging a fund of more than $2,000,000, for extensions and improvements, to include the construction of new power plants, electrical and mechanical equipment purchased, etc. It is proposed to electrify the entire system in the near future. Ralph Peters is president.

The Empire Metal Specialty Co., 327 Sixteenth Street, Brooklyn, is planning for the installation of new equipment to manufacture light metal die products.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until July 25, for a quantity of hacksaw blades for the Navy yards, South Brooklyn, and Philadelphia, as specified in schedule 9646. Also, for 226 ball pein hammers for use at the South Brooklyn yard, and under the same specification, schedule 9649, 840 machine and scaling hammers and copper hammers for Mare Island.

The New York Edison Co., 130 East Fifteenth Street, New York, will commence the immediate erection of a new power house at 19 East Thirty-second Street, to cost about $100,000, including equipment. It is reported to be arranging for the construction of a large generating plant, with cost estimated in excess of $1,200,000.

The Cling Cutlery Corporation, 28 West Forty-fourth Street, New York, has acquired a factory at Welland, Ont., for a new branch plant. It will be operated in the name of its subsidiary organization, the British Empire Cutlery Co.

Motors and other electric power equipment, conveying machinery, etc., will be installed in the new one-story and basement plant, 120 x 200 ft., to be erected at Elmsford, N. Y., by the Horace L. Day Co., 4 White Street, estimated to cost about $250,000.

The Argonaut Service Corporation, New York, has taken title to property on Eleventh Avenue, between Fifty-fifth and Fifty-Sixth streets, and will commence the erection of a six-story automobile service and repair works, estimated to cost about $400,000. Albert Kahn, Marquette Building, Detroit, is architect. Frank J. Davis is president.

The G. A. Schacht Motor Truck Co., Cincinnati, has leased the building at Thirteenth Street and Ely Avenue, Long Island City, recently completed, for an Eastern service and repair works.

Fire, June 24, destroyed one of the buildings at the plant of the Metal & Thermit Corporation, Cornelson Avenue, Jersey City, N. J., with loss estimated in excess of $50,000.

The Arctic Ice Co., Anglesea, N. J., is planning for enlargements in its plant, to include the installation of two 50-ton ice-manufacturing machines, with auxiliary equipment. W. E. Epler is general manager.

A power house will be established in connection with the new five-story addition to be erected by the board of directors, St. Mary's Hospital, Passaic, N. J., estimated to cost about $300,000. Crow, Lewis & Wick, 200 Fifth Avenue, New York, are architects and engineers.

A power house, refrigerating and cold storage plant will be installed in the new building to be erected at 142-50 North Canal Street, Newark, by M. Augenblick & Brother, 16 Commerce Street. It will be two-stories and basement, 80 x 105 ft., and estimated to cost close to $75,000. A one-story machine shop will also be built in connection with a garage for company trucks and cars.

A vocational department will be installed in the proposed high school to be erected at Maplewood, N. J., by the South Orange, N. J., Board of Education, estimated to cost about $500,000.

The Premier Rubber Co., Newark, N. J., recently organized, has leased buildings at 218-24 New Street, for the establishment of a new plant to manufacture rubber products. Possession will be taken at once and machinery installed. It is proposed to commence operations during August. The company is headed by John W. Stoddard, James A. Whitman and W. Howard Demarest, 790 Broad Street.

The Capital Phonolier Corporation, 54-60 Lafayette Street, New York, is making inquiries for two 18-in. swing engine lathes; two 4-spindle drill presses, size up to ½-in. drill; one emery wheel grinder to take an 8-in. wheel; and one 18-in. band grinder, all motor-driven.

The Board of Trade, Hightstown, N. J., is negotiating with a tool manufacturing company, now located at Newark, N. J., whose name is temporarily withheld, for the erection of a local branch plant. A committee composed of Forman A. Updike, Joseph H. Johnes and William H. Franklin is in charge.

The Wheeling Corrugating Co., 16 Desbrosses Street, New York, a subsidiary of the Whitaker-Glessner Co., has awarded contract to the Foundation Co., 120 Liberty Street, for a six-story factory branch, 120 x 140 ft., on Nelson Avenue, Long Island City.

The International Carbon Corporation, New York, recently organized by officials of the Columbian Carbon Co. and the Atlas Powder Co., 200 Fifth Avenue, New York, has preliminary plans under consideration for the construction of a European plant in France to manufacture special carbon products made from lignite, and similar to its works at Marshall, Tex., recently completed. To carry out the project and for other expansion the company is disposing of a stock issue of $1,210,000.

The Van Dorn Iron Works Co., 318 Broadway, New York, with plants at Cleveland and Long Island City, is disposing of a bond issue of $1,000,000, a portion of the proceeds to be used for expansion.

Chicago

CHICAGO, July 3.

No orders have yet been placed against the pending railroad lists, but early action is looked for. It is intimated that one or two roads will purchase only part of the equipment included in their inquiries. The Joliet, Ill., Board of Education has ordered $25,000 worth of machine tools and the Studebaker Corporation, South Bend, Ind., is closing for considerable equipment, one order for grinding machines alone totaling $40,000. The Continental Motors Co., Muskegon, Mich., is buying tools from time to time as required in the development of the Star motor, which it is manufacturing for the Durant Motors Co. Business booked by local dealers during the month of June consisted largely of scattering orders for one or two machines and in the aggregate totaled about same as sales in May. The closing of railroad business which is imminent will mean liberal bookings in July.

The American Tool Works and the Fosdick Machine Tool Co. have both advanced radial drills five per cent. Other radial drill makers are expected to meet these advances and it is expected that other lines of standard machines will be marked up in the near future.

Building permits issued in Chicago in June exceeded all records in number of structures, total frontage and cost. The total cost aggregated $27,500,000 as against $7,484,200 for the same month last year. The permits numbered 1400 and 18,510 ft. of frontage in June, 1921. The record for the first six months of 1922 is also the best in history. Permits numbered 6406, covering 200,058 ft. of frontage and involving $112,000,000, as against 2863 permits, 86,930 ft. and $48,336,950 in the first half of 1921. The best previous record since 1912 was that of the first six months of 1916 with 5551 permits, 176,692 ft. of frontage and $63,078,900. In total cost the first half of this year fell only $12,000,000 behind the total for the twelve months of 1921.

The Indiana Power Co., Vincennes, Ind., is negotiating for the purchase of the power plant and property of the Princeton Light & Power Co., Princeton, Ind. Upon acquisition it will be enlarged and improved. The company is also arranging for the purchase of the power plant at Oakland City, Ind., and will make extensions for service in this district.

The Texas Co. 17 Battery Place, New York, has acquired about 500 acres at Glenrock, Wyo., and will use a portion of the site for a new oil refinery. It will have a capacity of more than 5000 bbl. of crude oil daily, and will include complete by-product operating units for gasoline, naphtha, etc. The plant is estimated to cost in excess of $750,000, including machinery, and it is planned to have the first unit ready for operation in the fall.

The Watson Stabilator Co., Trenton, N. J., has been formed to sell Watson Stabilators in the central New Jersey district. These stabilators are manufactured in Philadelphia by the John Warren Watson Co. and are shipped to the Watson Stabilator Co., Trenton, complete and ready for installing.

E. Edelmann & Co., manufacturers of automobile accessories, have let contract for a two-story plant, 150 x 250 ft., at the southwest corner of Logan Boulevard and Holly Avenue, Chicago, to cost $250,000.

The Kastory Mfg. Co., manufacturer of automobile bodies, La Grange, Ill., has let contract for a one-story plant, 100 x 125 ft., to cost $28,000.

The U. S. Sample Co., printer, 901 South Wells Street, Chicago, has let a contract for a six-story printing plant, 125 x 125 ft., at the southeast corner West Jackson Boulevard and Laflin Street, to cost $350,000.

The Evans L. Reed Mfg. Co., manufacturer of store fixtures and household utensils, Sterling, Ill., will move its plant to Danville, Ill.

The Enterprise Foundry Co., Ft. Wayne, Ind., a recently organized corporation, will open a plant at High and Clark streets soon. A one-story building, 30 x 120 ft., and another two-story structure of the same ground area, have been procured and equipment has been installed. The company will specialize in small gray iron castings.

The Quaker Mill building, near Manchester, Iowa, is being razed by the Iowa Electric Co., preparatory to the erection of an hydroelectric power plant.

The Davis-Watkins Dairymen's Mfg. Co., North Chicago, Ill., manufacturer of dairy supplies, has let contract for a 120 x 160-ft. addition, to cost $80,000.

The Howard Wire Products Co., Terre Haute, Ind., has moved into a new plant on North Waugh Street between Markland Avenue and Harrison Street.

The Ramm & Yahl Brass Foundry Co., Ft. Wayne, Ind., recently organized, will soon start operations in the former plant of the Zimmerman Carpet Cleaning Co., 1911 St. Joe Boulevard. Castings of brass, aluminum, bronze and copper will be manufactured

The Anchor Concrete Mfg. Co., Adrian, Mich., has commenced the construction of an addition which will double its floor space.

Fire, June 21, destroyed a large portion of the plant of the George B. Miller & Son Mfg. Co., Waterloo, Iowa, manufacturer of gasoline engines, tractors, etc., with loss estimated in excess of $500,000, including machinery.

The Chicago & Eastern Illnois Railroad Co., 332 South Michigan Avenue, Chicago, is planning to rebuild its engine house and shop at West Frankfort, Ill., recently destroyed by fire, with loss estimated at $50,000.

The Benjamin Electric Mfg. Co., 806 West Washington Boulevard, Chicago, manufacturer of electrical specialties, is disposing of a bond issue of $1,500,000, a portion of the proceeds to be used for extensions and improvements. R. B. Benjamin is president.

The Minnesota Utilities Co., Eveleth, Minn., has plans in progress for the construction of a hydroelectric generating plant on Falls Lake, near Ely, Minn., with initial capacity of about 12,000 hp., estimated to cost about $1,750,000. R. M. Hesketh is secretary.

The Service Rubber Co., 401 Central Trust Building, Rock Island, Ill., is taking bids for a new three-story plant, 60 x 200 ft., estimated to cost about $100,000. Carrin & Horn, 311 Safety Building, are architects. J. T. Crowley heads the company.

The United Light & Railways Co., Davenport, Iowa, is arranging for a preferred stock issue of $20,000,000, a portion of the proceeds to be used for extensions and improvements.

A vocational department will be installed in the new two-story and basement high school to be erected at Charlton, Iowa, ground for which will be broken at once. William Gordon, Hubbell Building, Des Moines, Iowa, is architect.

The Danville, Champaign & Decatur Railway & Light Co., Danville, Ill., is disposing of a bond issue of $1,000,000, a portion of the proceeds to be used for extensions and improvements.

The American Steel & Wire Co., Denver, Col., has plans under way for the erection of a new building in the vicinity of its works, estimated to cost about $500,000.

The State Board of Control, St. Paul, Minn., will install an electric crane, air compressors and other mechanical equipment in the new mines experiment station at the State university.

The Climax Ice Cream Co., Producers' Dairy and Corbett Dairy Co., Denver, Col., recently affiliated, will install a cold storage plant in connection with a new creamery and dairy plant, estimated to cost about $300,000, including equipment.

The Biflex Products Co., North Chicago Ill., manufacturer of automobile bumpers, has taken title to property adjoining its plant, consisting of a foundry building and land for further expansion. The addition will be used at once for the manufacture of double-barbumpers and it is expected to increase the output more than 100 per cent. The plant area now approximates 5 acres.

The Commonwealth Edison Co., 72 West Adams Street, Chicago, will soon take bids for a new one-story power house, 78 x 100 ft., at 707-15 South La Salle Street.

The J. L. Clark Mfg. Co., Rockford, Ill., manufacturer of metal cans and containers, will commence the erection of a one-story addition, 60 x 190 ft.

Toth & Co., 1301 Larabee Street, Chicago, are arranging for the installation of machine tools, dies and other equipment at their machine shop.

Philadelphia

PHILADELPHIA, July 3

The James H. Billington Co., 113 Chestnut Street, Philadelphia, manufacturer of textile mill equipment and supplies, has filed plans for a new machine shop at 1528-48 North Fifth Street, to cost about $40,000.

Frederick W. Hosbach, 2415 South Street, Philadelphia, will build a new two-story wood-working plant, 64 x 76 ft., at Twelfth and Brown streets, to include machine shop and other mechanical departments. Henry P. Schneider, 2713 York Road, is architect.

Fire, June 25, destroyed the tankage department at the plant of the Pennsylvania Synthetic Gas & Chemical Co., Sixty-third Street, with loss reported at close to $25,000.

Thomas Savill's Sons, 1310 Wallace Street, Philadelphia, manufacturers of pipe, plumbing equipment, etc., have awarded contract to Seeds & Steinmetz, 1101 Divinity Place, for a two-story foundry, 42 x 60 ft., at 635-7 North Watts Street. H. B. Waldon, 10 South Eighteenth Street is architect.

The N. & G. Taylor Co., 300 Chestnut Street, Philadelphia, has awarded contract to the Belmont Iron Works, Twenty-second Street and Washington Avenue, for a one-story foundry, 50 x 90 ft., and one-story general manufacturing building, about 75 x 140 ft., at Cumberland, Md.

The American Motor Body Co., Eighteenth and Lehigh Streets, Philadelphia, operated by the Hale & Kilburn Co., is arranging for increased production, following the receipt of a contract from the Durant Motors, Inc., New York, for 50,000 car bodies.

T. B. Martindale, Broad Street and Allegheny Avenue, Philadelphia, has awarded contract to the Bowden Construction Co., 1935 Chestnut Street, for a two-story automobile service and repair building, 100 x 265 ft., estimated to cost approximately $100,000.

The Philadelphia Paper Mfg. Co., River Road, Philadelphia, is said to be arranging for the early purchase of cranes and conveying machinery for installation at its new building at Nixon and Fountain streets, now in course of erection. It has also filed plans for improvement in its present building at this location.

W. D. Warren, Mt. Holly, N. J., has awarded a contract to McCloskey & Co., 1620 Thompson Street, Philadelphia, for a one-story automobile service building, with machine repair department, 40 x 100 ft., estimated to cost approximately $55,000. Folsom & Stanton, Fuller Building, Philadelphia, are architects.

A one-story machine repair shop, 48 x 60 ft., will be constructed by the Lebanon Silk Co., Lebanon, Pa.

The Rowe-Stuart Motors Corporation, Lancaster, Pa., has plans nearing completion for a new plant, 270 x 325 ft., on Fountain Avenue, for the manufacture of motor truck equipment.

August N. C. Madsen, Harrisburg, Pa., operating a concrete block manufacturing plant at Nineteenth and Pemberton streets, has tentative plans under consideration for enlargements to increase the output from 1500 to 3600 blocks per day. Automatic machinery will be used for production.

A vocational department will be installed in the two-story and basement high school, 140 x 180 ft., to be erected at Leechburg, Pa., estimated to cost about $250,000. W. G. Eckles, Lawrence County Bank Building, New Castle, Pa., is architect.

The Womelsdorf Electric Co., Womelsdorf, Pa., recently organized by officials of the Berkshire Electric Co., 50 North Duke Street, Lancaster, Pa., is considering extensions and improvements in the municipal power plant, just acquired. In the future it will be operated as a private enterprise.

The Blue Mountain Electric Co., Millersburg, Pa., is planning the construction of a new hydroelectric power plant on local site, recently acquired.

J. K. Wetzel & Sons, Shamokin, Pa., will commence the immediate erection of a two-story automobile service and repair works, 80 x 100 ft. William H. Lee, 32 South Seventeenth Street, is architect.

James J. H. McNally and A. W. Grant, Harrison Building, Philadelphia, have commissioned N. W. Akimoff, same address, mechanical engineer, to prepare plans for new works at Fourth, Sixth and Water streets, Camden, N. J., to manufacture American Diesel engines, to be one and two stories, 100 x 500 ft., estimated to cost close to $500,000, with machinery. The city will vacate a number of streets at the site, and a bond of $25,000 has been posted to insure the construction. A company is being organized to build and operate the plant.

The Cumberland Valley Light & Power Co., Harrisburg, Pa., has arranged for a bond issue of $40,000 for extensions and improvements.

A vocational department will be installed in the two-story and basement high school, 130 x 150 ft., to be erected at Dunlo, Pa., estimated to cost about $100,000. W. C. Ackles, Lawrence County Bank Building, New Castle, Pa., is architect.

The Jones Machine Works, Fifty-third Street and Lansdowne Avenue, Philadelphia, is said to be arranging a list of equipment for installation at its proposed new machine shop at Primos, Pa., estimated to cost about $50,000.

Motors, conveying apparatus and other mechanical and electrical equipment will be installed in the addition to be constructed by the Blumenthal Brothers Co., Margaret and James streets, Philadelphia, estimated to cost about $175,000. The Ballinger Co., Twelfth and Chestnut streets, is architect.

Motors, controlling devices and other electrical and mechanical equipment, will be installed in the new two-story printing plant to be constructed on Main Street, Washington, Pa., by the Observer Publishing Co., estimated to cost about $150,000.

A vocational department will be installed in the new two-story high school to be constructed at Throop, Pa., estimated to cost about $170,000. John J. Howley, Traders' Bank Building, Scranton, Pa., is architect.

The Bethlehem Foundry & Machine Co., Front Street, Bethlehem, Pa., has acquired the plant and business of the Wedge Mechanical Furnace Co., Greenwich Point, Philadelphia. It includes patents for the furnaces manufactured for mining service, and the new purchaser will remove this branch of the business to its works at Bethlehem.

Detroit

DETROIT, July 3.

The Motor Wheel Corporation, 701 East Saginaw street, Lansing, Mich., has awarded contract to the H. G. Christman Co., Lansing, for two additions, each one-story, 120 x 400 ft., and 120 x 240 ft., respectively. The larger structure will be used for the manufacture of wire wheels, etc., and the other building for gear production. M. E. Harper is president and general manager.

The Ryan Foundry Co., Lansing, Mich., will develop maximum capacity at its plant at once. A contract has been secured from the Grant Motor Co., Cleveland, for castings for 100,000 automobile engines.

The Common Council, North Muskegon, Mich., will install an electrically operated pumping plant in connection with its proposed new waterworks, estimated to cost about $300,000.

The Michigan Gas & Electric Co., Ishpeming, Mich., has plans nearing completion for a new electric generating plant at Three Rivers, Mich., estimated to cost in excess of $100,000. An addition will also be erected to the present plant at Constantine, Mich., to cost about $40,000.

The Gibson Refrigerator Co., Greenville, Mich., manufacturer of refrigerators and refrigerating equipment, has awarded contract to J. Herrmann & Son, Perkins Building, Grand Rapids, for a four-story addition.

The Whitcomb Hotel Co., St. Joseph, Mich., has plans under way for a new power house. Cahill & Douglas, 217 West Water Street, Milwaukee, Wis., are engineers.

The Detroit Steam Motor Corporation, 38 Hendrie Street, Detroit, manufacturer of steam-driven automobiles, has tentative plans under way for the establishment of a branch plant at Windsor, Ont., to be operated under the name of the Windsor Steam Motors, Ltd.

The Bay City Freezer Co., Bay City, Mich., has completed plans for a new one and three-story ice-manufacturing plant.

The Morse Chain Co., Ithaca, N. Y., manufacturer of silent chain transmissions, has preliminary plans for a new branch factory at Detroit, and has secured a site on the Detroit Terminal Railway line, near Warren Avenue. It will be of reinforced concrete and will approximate 60,000 sq. ft. of area.

The Hayes Wheel Co., Jackson, Mich., is disposing of a stock issue of $825,000, a portion of the proceeds to be used for extensions. It operates branch plants at Albion, Mich., and Anderson, Ind., with total production of about 16,000 automobile wheels daily.

The Wilson Foundry & Machine Co., Pontiac, Mich., a subsidiary of the Willys-Overland Co., Toledo, Ohio, is arranging for immediate increase in the manufacture of Willys-Knight motors. A portion of the No. 3 plant of the company will be used for this purpose, and it is proposed to double, approximately, the present output.

The Cadillac Malleable Iron Co., Cadillac, Mich., was incorporated recently with capital stock of $350,000 to manufacture malleable iron castings and related products. The malleable castings produced at this plant will be made exclusively of charcoal iron. Officers of the company are: J. C. Ford, president; C. T. Mitchell, vice-president; R. J. Teetor, secretary and general manager; George G. Brown, treasurer. Construction of the plant was begun in 1921, but work was delayed and the plant is now being completed. Equipment is being installed and manufacturing operations will begin late in the summer. The Foundry Equipment Co., Cleveland, will install the core ovens; Holcroft & Co., Detroit, will put in the air furnace; steel work was fabricated and erected by the Indiana Bridge Co., Muncie, Ind., steel sash being furnished by the Detroit Steel Products Co., Detroit.

The Furnace Fan Co., capital $50,000 preferred and 150,000 shares no par value common stock, has been formed to manufacture appliances used in connection with hot air systems. An option has been secured on a vacant plant at Dowagiac, Mich. The incorporators are: N. B. Wales, Kalamazoo; Dr. F. N. Bonine, Niles, and Marinus Vander-Maas, Plainwell.

The C. G. Spring Co., Kalamazoo, has purchased the machinery and plating plant of the Shakespeare Products Co. and will operate it in the future.

Milwaukee

MILWAUKEE, Wis., July 3.

It is stated by sales directors of large machine-tool manufacturing concerns in this market that more real progress was made in sales and production in June than in any month in nearly two years, while at the close, the prospects were much more favorable as well. The outlook embraces genuine hope of a renewal of demand from railroad sources, despite their labor difficulties. The buying of tools by automotive shops is well sustained. Manufacturers of milling machines report increasing patronage and active inquiry, which in the last four to six weeks enabled them to advance production schedules to some extent, although the rate of operations still is unsatisfactory from the standpoint of profitable operation. In the local tool trade there is no expectancy of a sudden demand, but hope is well grounded that the improvement noticeable in the last 60 days will continue. This view is supported by the steadily growing scope of foundry operations and the new construction movement, especially in metal-working industries.

The Bahde Mfg. Co., 2621 Vine Street, Milwaukee, a new corporation organized to do a general jobbing machine shop business, has engaged Leiser & Holst, 105 Wells Street, to design a one-story brick and steel shop, 30 x 150 ft., to be erected at Thirtieth and Chambers streets. A miscellaneous list of equipment for toolroom and production purposes will be purchased at once. Carl A. H. Bahde is president and general manager.

The Middle West Mfg. Co., Beaver Dam, Wis., has been incorporated with an initial capitalization of $30,000 to manufacture farm tools, barn equipment, steel dairy fixtures, etc. It plans to take over an existing plant, but details have not been given out. The incorporators are C. A. Friday, W. R. Zimmerman and M. B. Bulger.

The West Bend Aluminum Co., West Bend, Wis., manufacturer of aluminum stampings, drawn-ware, novelties, etc., is undertaking an important steam power plant enlargement project, involving the purchase of additional boilers, generators, two new steel stacks and other equipment. The work is in charge of the Federal Engineering Co., 444 Milwaukee Street, Milwaukee.

The Willow River Power Co., Hudson, Wis., is a new $500,000 corporation chartered in Wisconsin to build, maintain and develop water powers and steam generating plants and distributing and transmission systems. It is hoped to start work this year on an extensive water power development project on the St. Croix River and Willow River branch. Tentative specifications are under consideration. The principals in the enterprise are F. P. Buckhardt, A. P. Schultz and B. A. Buckhardt, of Hudson.

The Pawling & Harnischfeger Co., Milwaukee, has taken an order for one 10-ton electric traveling crane for the new plant which is being erected by the Claybourn Process Corporation, formerly of Menasha, Wis., at Humboldt Avenue and Franklin Street, in Milwaukee, at a cost of $500,000 Herman J. Esser, Camp Building, Milwaukee, is supervising architect.

The Board of Education, Stevens Point, Wis., has let the general contract to the Immel Construction Co., Fond du Lac, Wis., for a new high school with manual training departments, estimated to cost $250,000. Vocational equipment will not be purchased until early in the fall. Robert A. Messmer & Bro., Majestic Building, Milwaukee, are the architects.

The Wisconsin Valley Electric Co., Wausau, Wis., has purchased the entire holdings of the Tomahawk, Wis., Light, Telephone & Improvement Co., taking possession July 1. The new owner plans to develop a 67-ft. head at Grandfather Dam, the highest waterfall on the Wisconsin River, between Tomahawk and Merrill, at an estimated cost of $200,000. Specifications are now in preparation.

The Milwaukee Vending Machine & Mfg. Co., Milwaukee, has been incorporated with a capital stock of $25,000 to manufacture special devices and appliances. A plant has been acquired at 1261 Kinnickinnic Avenue and is now being equipped. The principals are William O'Brien, 966 Mound Street; Robert W. McCormick, and Robert F. Downey, 391 Pryor Avenue, local.

Henry Behrens and Ervin H. Stibbe, Peshtigo, Wis., conducting a machine shop and garage, are organizing a new corporation to engage in quantity production of a line of special automotive service shop tools designed and patented by Mr. Behrens, principally an engine stand and bearing tool.

The Lusk Light & Power Co. of Lusk, Wis., has been incorporated with a capital stock of $25,000 to build and operate hydroelectric generating plants and generally furnish electric current for light and power purposes. The incorporators are P. M., A. K. and O. L. Pederson, all of Lusk.

The E. J. Pfiffner Lumber Co., Stevens Point, Wis., has plans for a two-story brick and concrete planing mill, 60 x 110 ft., which will require a full complement of new machinery with individual electric motor drive. The architect is Frank Spalenka, Stevens Point.

The Bukolt Mfg. Co., Stevens Point, Wis., manufacturer of automotive specialties and steel-shod tire protecting devices, is making inquiry for additional miscellaneous equipment to handle a 10-year contract for tire protectors from the Atlantic Coast Auto Exchange, Inc., Baltimore, Md., representing $100,000 a year. John J. Bukolt is president and general manager.

The Menasha Machinery Mfg. Co., Menasha, Wis., has filed a notice of dissolution. The interests of the concern have been embodied in the Claybourn Process Corporation, which is now erecting a $500,000 plant in Milwaukee equipped for manufacturing multi-color printing presses. L. W. Claybourn, president of the dissolved concern, is president and general manager of the new corporation.

The Northwest Engineering Works Co., Green Bay, Wis., is increasing its output of crawler type traveling cranes and hoists from two a week to four and is planning to place its plant on a 24-hr. schedule to meet demands from all sections of the United States.

The Wisconsin Power, Light & Heat Co., Madison, Wis., which is engaged in a plant enlargement program involving an additional investment of about $750,000, has recently increased its authorized capitalization from $2,000,000 to $3,000,000, the new issues consisting of $1,000,000 common and $2,000,000 preferred stock.

The Gulf States

BIRMINGHAM, July 3.

The Wright Steam Motor Co., J. B. Wright, president and general manager, Baton Rouge, La., has plans under way for new works to manufacture steam-operated engines for automotive service, comprising a main building 100 x 150 ft., with smaller structures. A list of equipment is being arranged.

The oil refinery of the Beaver Electra Refining Co., Electra, Tex., has been acquired by D. E. DeCourse, Devol, Okla., and associates. A company will be formed to operate the plant at an early date. A number of extensions and improvements will be made.

James E. Taylor, Cleburne, Tex., is organizing a company to construct and operate a local electric power plant. It is said that the plant will cost about $50,000.

The Common Council Homestead, Fla., has advanced the date for bids for equipment for its municipal electric power until July 28. The apparatus will include two complete turbo-generator sets, each 300 kw., three phase, 60 cycle, 2300 volts; two boilers, each 150 to 200-hp.; one 10-panel switchboard, and one 10-ton traveling crane. B. M. Duncan is engineer; R. E. Edwards is town clerk.

The Ford Motor Co., Highland Park, Mich., will take bids at once for a new one and two-story assembling plant on property recently acquired at New Orleans, 430 x 460 ft., on North Peters Street. Albert Kahn, 1000 Marquette Building, Detroit, is architect.

J. D. Ford, Bristow, Okla., is organizing a company to construct and operate a new oil refinery in the vicinity of Cross Plains, Tex.

The Edwards Wheel & Body Co., 204 Washington Street, Dallas, Tex., has filed plans for a new one-story plant.

The Nueces County Water Improvement District Commissioners, No. 3, Robstown, Tex., will erect an electrically operated pumping plant in connection with an irrigation project in the north central section of the county. It will have a capacity of about 18,000 gal. per min.

Plans are being perfected for the reorganization of the Louisiana Motor Car Co., Cedar Grove, La., and it is expected to begin operations at an early date. Improvements will be made and new equipment installed. The reorganization is being carried out under the direction of the Commercial National Bank, which recently acquired the physical properties of the company.

The Pine City Property Owners, Progressive Association, Pine City, Fla., has preliminary plans in progress for a municipal electric light and power plant. J. A. Monney is secretary.

The Jahncke Dry Docks, Inc., New Orleans, La., has arranged for a bond issue of $1,500,000, a portion of the proceeds to be used for extensions, improvements, etc. Ernest L. Jahncke is president.

The West Florida Power Co., Tallahassee, Fla., recently organized with a capital of $1,000,000, is perfecting plans for a new hydroelectric generating plant on the Ocklocknee River, including transmission system, estimated to cost in excess of $400,000. B. H. Hardaway, Sr. and Jr., head the company.

Fire, June 25, destroyed a portion of the plant of the Lee Lumber Co., Alexandria, La., including saw mill, with loss estimated at about $100,000, including machinery. It is proposed to rebuild at an early date.

The Texas Boiler Works, 3214 Hickory Street, Dallas, Tex., has arranged for the establishment of a department for the repair and overhauling of railroad tank cars.

The Western Compress & Storage Co., Abilene, Tex., is planning the erection of a series of branch cotton compress and storage plants at McKinney, Hamlin, Sweetwater and Slaton, Tex., estimated to cost about $80,000, including equipment.

The Bennett Motor Co., Breckenridge, Tex., has leased a two-story building, 100 x 150 ft., to be erected on local site, for the establishment of a new service and repair works. It will cost close to $50,000.

Fire, June 23, destroyed a portion of the plant of the Stamford Cotton Oil Co., Stamford, Tex., with loss estimated at about $40,000, including equipment.

The Central South

ST. LOUIS, July 3.

The Huntzinger Advertising & Mfg. Co., 909 Baltimore Avenue, Kansas City, Mo., manufacturer of metal novelties, has awarded contract to the Pratt-Thompson Construction Co., 505 Republic Building, for a new six-story and basement plant, 30 x 140 ft., at 108 West Tenth Street, estimated to cost $110,000, including equipment. The Reyburn Engineering Co., 609 Weldheim Building, is engineer.

E. J. Robinson, Cheney, Kan., is arranging a list of equipment for installation in a machine shop for automobile repairs and other work.

The Farris Hardwood Lumber Co., Nashville, Tenn., is planning to rebuild the portion of its saw mill, recently destroyed by fire, with loss estimated at close to $45,000.

The Mississippi River Commission, First and Second districts, Custom House, Memphis, Tenn., will receive bids until July 15, for one marine type refrigerating and ice-making plant.

The Duncan Machinery Co., 721 North Central Avenue, Knoxville, Tenn., machinery dealer, is making inquiries for locomotive type boilers and other power equipment.

Electric equipment, hoisting machinery, power equipment, conveying apparatus will be installed in the new elevator to be constructed by the Victory Mill & Elevator Co., Wichita, Kan. T. F. Dawkins is secretary.

A vocational department will be installed in the new high school to be erected at Mount Pleasant, Tenn., estimated to cost about $75,000, revised plans for which have been prepared by George Waller, architect, Independent Life Building, Nashville, Tenn.

The Oklahoma General Power Co., Muskogee, Okla., has plans under way for the erection of a new electric power plant with initial capacity of about 10,000 hp.

The Goodwin-Field Motor Car Co., 250 East Main Street, Lexington, Ky., has plans nearing completion for a new one-story service and repair works, 100 x 200 ft.

The Gary Eagle Marble Mills, Knoxville, Tenn., operated by the Gray Eagle Quarries, will commence the construction of a new one-story plant, 125 x 160 ft., to be equipped for cutting, finishing, polishing and kindred operations. It is estimated to cost close to $40,000, including equipment. Charles L. Lawton is architect in charge.

The Wichita Key & Novelty Co., 132 North Topeka Avenue, Wichita, Kan., is planning for the installation of a number of machine tools and other equipment.

The Associated Gas & Electric Co., operating the Kentucky Public Service Co., Bowling Green, Ky., and other electric power organizations, has arranged for a preferred

stock issue of $270,000, a portion of the proceeds to be used for extensions and improvements.

The Motor-Q Battery Co., 1619 East Douglas Avenue, Wichita, Kan., is planning for the installation of machine tools and other equipment. J. W. Martin heads the company.

The Board of Administration, State Penitentiary, Lansing, Kan., will build a new power house at the institution. James A. Kimball, State House, Topeka, Kan., is business manager in charge.

The Dixie Power Co., Memphis, Tenn., has plans under way for a hydroelectric generating plant on the White River, estimated to cost in excess of $750,000, including machinery and transmission system.

The Hermitage Portland Cement Co., 174 Third Avenue, North, Nashville, Tenn., has work under way on its mill at Old Hickory, and is receiving bids for the machinery installation. A power house will be established in connection with the new plant, which is estimated to cost approximately $1,000,000. R. T. Miller is secretary.

The Saline River Hardwood Co., Pine Bluff, Ark., has plans under way for extensions and improvements in its plant to cost about $100,000. New machinery will be installed.

An electric power house will be installed in the new plant to be established by the Silk Tie Knitting Co., Knoxville, Tenn., recently organized. V. H. Spruill is president.

The Success Specialty Co., P. O. Box 102, Bells, Tenn., is making inquiries for a quantity of wood-working machinery, electric motors and other power apparatus.

The Ozark Creamery Co., Neosho, Mo., is planning for the installation of new refrigerating machinery at its ice-manufacturing and cold storage plant.

Indiana

INDIANAPOLIS, July 3.

The Chapman Price Steel Co., Shelby Street, Indianapolis, is preparing plans for an addition to its plant, forming a complete operating unit, estimated to cost about $500,000, including machinery. Lief Lee, Frick Building, Youngstown, Ohio, is engineer. Niles Chapman is president.

Joseph Entwhistle, Terre Haute, Ind., has leased the plant of the Terre Haute Vitrified Brick Co., St. Mary's, recently purchased by Charles Minshall. It will be remodeled for the manufacture of face brick instead of paving brick, as heretofore.

The Rockford Mfg. Co., 2001 English Avenue, Indianapolis, manufacturer of transmission pulleys, etc., has awarded contract to the Builders' Construction Co., 840 North Meridian Street, for a new one-story machine shop, estimated to cost about $40,000.

George Raub, Logansport, Ind., has acquired property on Broadway as a site for a new two-story automobile service building, including machine repair shop.

A vocational department will be installed in the new two-story and basement East Side high school to be erected at Evansville, Ind., estimated to cost about $300,000, including equipment. J. C. Llewellyn, 38 South Dearborn Street, Chicago, is architect.

The Studebaker Corporation, South Bend, Ind., has laid foundations for five new buildings, comprising a four-story structure, 100 x 600 ft.; a one-story shop, 50 x 96 ft.; a two-story shop, 72 x 156 ft.; one-story car loading and car storage building, and a one-story power house addition, 50 x 50 ft. The extensions will cost in excess of $500,000. Albert Kahn, 1000 Marquette Building, Detroit, is architect.

W. J. Holliday & Co., Indianapolis, manufacturers of iron and steel products, has acquired for future expansion, through its subsidiary organization, the J. S. Holliday Realty Co., property at 110-16 South Meridian Street, 48 x 195 ft., improved with a machine shop and adjoining building.

The Calumet Tank & Mfg. Co., Hammond, Ind., will commence the erection of a new one-story foundry, 60 x 130 ft. on Industrial Road, estimated to cost about $75,000.

Buffalo

BUFFALO, July 3.

The Ulrich Plan File Co., 516 West Fourth Street, Jamestown, N. Y., is planning for the erection of a new factory, estimated to cost close to 25,000.

The Romer Axe & Tool Co., 805 Main Street, Dunkirk, N. Y., will install electric motors and other electrical equipment at its plant.

The plant and property of the Parenti Motors Corporation, Buffalo, bankrupt, is being purchased by the Hanover Mfg. Co., from the Marine Trust Co., trustee, for about $225,000. The new owner will take immediate possession and will install machinery for the manufacture of a small automobile, two-cylinder, air-cooled motor, designed to take the place of motorcycles.

A vocational department will be installed in the new two-story high school, 50 x 130 ft., to be erected at Clarence, N. Y. Herbert C. Swain, 52 West Chippewa Street, Buffalo, is architect.

The Mancusco & Son Co., 322 Elliott Street, Batavia, N. Y., has plans for a two-story automobile service and repair building, 81 x 100 ft., on East Main Street, estimated to cost close to $50,000.

The Eberhardt Steel Products Co., 43 Chelsea Street, Buffalo, is planning for the installation of forge shop equipment in an extension.

The Niagara Gorge Power Co., Niagara Falls, N. Y., has tentative plans under consideration for a new hydroelectric generating plant on the lower Niagara River.

A vocational department will be installed in the new three-story high school, 180 x 275 ft., to be erected at Pine Avenue and Portage Road, Niagara Falls, N. Y., estimated to cost $450,000. It will replace a building recently destroyed by fire. The Associated Architects of Niagara Falls, Inc., Niagara and Third Streets, is architect.

The Allen Mfg. & Welding Corporation, 163 Adams Street, Buffalo, is arranging a list of equipment for installation at its new plant on Washington Street.

Pittsburgh

PITTSBURGH, July 3.

Business in machinery and equipment in June in this district has fallen short of the expectations created by the good showing of the previous month. Inquiries have not fallen away materially, but for some reason, presumably to get the benefit of freight rate reductions, effective July 1, or because of the uncertainty caused by the coal strike and the threat of labor troubles on the railroads, growing out of the wage reduction which went into effect Saturday, buyers have been extremely cautious in the matter of placing orders. No general lists of machine tools lately have appeared and while the day to day busines reaches a fairly satisfactory aggregate, it is not as pleasing to the trade as would be individual orders calling for several tools.

The crane market still shows a fair degree of activity. The Pittsburgh Plate Glass Co., Ford City, Pa., has placed an order for two 5-ton, 100-ft. span Shaw cranes, while the Morgan Engineering Works, Alliance, Ohio, has taken an additional 75-ton ladle crane and a 25-ton standard crane for the Steubenville works of the Wheeling Steel Corporation. The Alliance Machine Co., Alliance, Ohio, has been awarded four cranes by the Weldless Tube Co., Wooster, Ohio. Formal inquiry for 35 to 40 cranes for the new plant of the National Tube Co., Gary, Ind., is likely to go out soon. Engineering plans are completed and excavation and grading work is expected to start in the near future. The company itself probably will make most of pipe-bending, straightening and other machinery for this plant.

The Youngstown Steel Co., Youngstown, Ohio, H. Z. Bixler, Youngstown, chief engineer, recently broke ground for a new plant and has placed the order for a muck bar mill with the United Engineering & Foundry Co. This company will engage in wrought iron made in mechanical puddlers. The General Electric Co. has taken the order for a 1000-kw. turbo-alternator unit, three-phase, 60-cycle, 2300 volts, with exciter and switchboard complete, for the Preston County Coke Co., Morgantown, W. Va. The condenser to go with the alternator has been placed with the Wheeler Condenser & Engineering Co., Carteret, N. J.

The Star Ornamental Iron & Works Co., 3625 Frazier Street, Pittsburgh, is planning for the installation of additional equipment.

The Clarion River Power Co., Johnstown, Pa., affiliated with the Penn Public Service Co., with headquarters at the same place, is perfecting plans for the first of three new hydro-electric generating plants at Piney Creek, Clarion River. It will have an initial capacity of 22,000 hp., and is estimated to cost about $3,000,000. The company has two other sites on the same river, and will develop these later. A bond issue of $2,700,000 is being sold to be used in connection with immediate construction. F. T. Hepburn is president of both companies.

A vocational department will be installed in the two-story and basement high school addition to be erected at McKeesport, Pa., estimated to cost about $300,000. T. B. and Lawrence Wolfe, Century Building, Pittsburgh, are architects. Inquiries are being made for machine tools and other equipment.

Ovens and power equipment, electrical apparatus, conveying machinery, etc., will be installed in the new three-story baking plant to be erected at New Kensington, Pa., 80 x 100 ft., by the Premier Baking Co., an interest of the Fayette Baking Co., Connellsville, Pa., estimated to cost about $100,000, including equipment. B. H. Prack, Keystone Building, Pittsburgh, is architect.

The Blystone Mfg. Co., Cambridge Springs, Pa., manu-

facturer of concrete products, etc., is planning for a one-story works, 90 x 400 ft., and a two-story structure, 40 x 95 ft., to replace buildings recently destroyed by fire.

The Stonecrete Corporation, 6023 Penn Avenue, Pittsburgh, Pa., will install a quantity of used machinery, including lathes, drill press, shaper, boring mill, punch and shear, etc. Inquiries are being made.

Cunningham, Miller & Enslow, Huntington, W. Va., will install conveying and other equipment at their coal properties, at Kistler, W. Va., to cost about $25,000.

In connection with extensions and the installation of new equipment at the municipal waterworks, Fairmont, W. Va., bids for which will be received until July 10, quotations are also being asked for an electrically-operated hoist for handling screens. Fuller & McClintock, 170 Broadway, New York, are consulting engineers.

The Spencer Coal Co., Whitby, W. Va., is planning for the installation of new electrical equipment and other machinery. It has arranged for a change of name to the Bowyer Smokeless Coal Co W. H. Ruby heads the company.

The Hardy Coal Co., Huntington, W. Va., has plans under way for the installation of electrical machinery and other equipment on property recently acquired in McDowell County. Paul Hardy is president.

The Manown Mfg. Co., Oliver Building, Pittsburgh, manufacturer of firebrick, is about to begin the erection of a new plant.

A vocational department will be installed in the new high school to be erected at Sewickley, Pa., estimated to cost about $250,000. Press C. Dowler, Magee Building, Pittsburgh, is architect.

The Lakeside Refining Co., Franklin, Pa., is planning for extensions and improvements in its oil refinery, comprising the former plant of the Foco Oil Co., recently acquired, estimated to cost about $55,000.

The H. M. Crawford Coal Co., Grafton, W. Va., is considering rebuilding the tipple at its properties, destroyed by fire June 27.

B. L. Bailey, Bluefield, W. Va., has awarded a contract to the W. T. Owen Co., Earle Avenue, for a new four-story automobile service and repair works, 83 x 120 ft., estimated to cost about $50,000.

The Hall & Thomas Co., 45 Hilton Street, Bradford, Pa., manufacturer of cement and concrete products, is planning for the installation of new equipment. B. F. Hall heads the company.

The Island Creek Coal Co., Holden, W. Va., will soon arrange for the equipment installation in its new machine shop, plans for which are under way. The structure will replace a works recently destroyed by fire with loss of about $75,000.

New England

BOSTON, July 3.

May was one of the most unprofitable months experienced by the New England machine tool trade in several years, and June was not appreciably better, according to a majority of dealers. In the closing days of June, however, there were tangible indications of a turn for the better. Prospects, which in the aggregate amount to a considerable investment by customers, believed by the machine tool trade to have passed beyond the active stage, are again showing life. The renewed activity generally is ascribed to a growing belief among users that the price situation is stronger and that the machine tool market has passed its extreme low point of depression. Substantiating this is the announcement during the past week of advances on some sizes of turret machines amounting to 10 per cent, and on small radial drills about 7½ per cent. These follow closely on advances in standard lathes. In addition, the inclination to cut prices on planers is less noticeable.

Business the past week was interrupted by holidays. Virtually all Boston machine tool houses closed from Saturday to Wednesday. Previous to Saturday, however, sales of new machines again exceeded those of used machinery, but the largest single transaction was six specially designed profilers, purchased by a Massachusetts textile machinery manufacturer. Sales of new tools otherwise were of one or two machines in individual cases and include a No. 3 Universal milling machine to a Connecticut concern; hoist equipment having 4000 lb. capacity to a Massachusetts textile machinery maker; a 1 x 15-in. turret lathe to a Worcester screw manufacturer; numerous bench drills to radio manufacturers and machine shops engaged on special work, and hand screw machines to local and out of town machine shops. Inquiries for used equipment are coming from New York, Pennsylvania and New Jersey, as well as from various New England points. In connection with radio appliances, it is interesting to note that manufacturers are quoting twelve and thirteen months' deliveries.

The demand for small tools continues active. June bookings by the leading machine tool houses were fully up to those of May, which was an exceptionally good month. The call for machine parts is less active, however. Some sizes of motors are difficult to obtain.

The J. T. Robertson Co., soap, Manchester, Conn., is to construct a $100,000 plant, two stories, 60 x 150 feet.

The Kenney Electric Co., New London, Conn., capitalized for $300,000, has been incorporated to manufacture electric safety razors. It will begin business with $150,000. The incorporators are C. H. Kenney, William Weiner, Richard Hendel, Joseph Swartz and George Packer.

Considerable damage was done to the floating machine shop owned by Howard & Horne, Portland, Me., when it capsized last week. Heavy machinery and tools probably will be a total loss.

The Stafford Co., Readville, Mass., textile machinery, has sold $550,000 8 per cent cumulative preferred stock. Funds derived from this sale will be used to pay off floating indebtedness, provide additional working capital and the purchase of equipment and material.

The MacKenzie Co., P. O. Box 432, Westerly, R. I., manufacturer of textile machinery, is considering the installation of spinning frame equipment and other machinery.

The Bantam Ball Bearing Co., Bantam, Conn., has taken bids for an addition to its plant at Litchfield, Conn., to cost about $150,000, including equipment. The Fletcher-Thompson Co., Fairfield Avenue, Bridgeport, Conn., is architect.

The Carroll Wire Co., Huntington Avenue and East Aurora Street, Waterbury, Conn., recently incorporated, has elected the following officers: P. H. Carroll, president; V. J. Carroll, vice-president and treasurer; F. W. Carroll, secretary and assistant treasurer. It will operate a plant at the above address.

The Maine & New Brunswick Power Co., Presque Isle, Me., will make enlargements and improvements in its power plant. New equipment will be installed. A. R. Gould is general manager.

S. J. Cardner, 32 Taylor Street, Springfield, Mass., will commence the immediate erection of a new one-story automobile service building, 55 x 220 ft., with machine repair shop, at 162 North Main Street. C. C. West, 25 Harrison Avenue, is architect.

The American Electric Service & Maintenance Co., Springfield, Mass., will use its new building, recently completed, for a complete line of repair work for electric power equipment, including motor rebuilding, transformer rewinding, etc.

The Worcester Cold Storage & Warehouse Co., 284 Franklin Street, Worcester, Mass., will build an addition to its cold storage plant, to cost close to $40,000.

A vocational department will be installed in the three-story high school to be constructed on Commercial Street, Adams, Mass., estimated to cost $350,000. The Frank Irving Cooper Corporation, 33 Cornhill Street, Boston, is architect.

Fire, June 25, destroyed a portion of the plant of the American Powder Co., South Acton, Mass., with loss approximating $100,000.

A one-story power house will be erected by the Sturdy Memorial Hospital, Attleboro, Mass. Kendall, Taylor & Co., 142 Berkeley Street, Boston, are architects: R. D. Kimball Co., 6 Beacon Street, Boston, are consulting engineers.

The Oldsmobile Co., Hartford, Conn., has purchased a site on Main street, Manchester, Conn., and will build a garage and service station.

Cleveland

CLEVELAND, July 3.

The Ford Motor Co., Detroit, placed orders during the week, for about $150,000 worth of equipment, including a heavy duty engine lathe with 186-in. swing and an 86-ft. bed, five die sinking machines and two large vertical boring mills. It is reported that the Fisher Body Corporation and the Wilson Body Co., Detroit, will be in the market in about 30 days for considerable machinery, mostly wood-working, to equip extensions now under way.

Local dealers did a fair volume of business during the week, but practically all in single tools, orders coming from well scattered sources. The aggregate business placed by manufacturers and dealers during June showed an improvement over May. The Ohio Brass Co., Mansfield, Ohio, is purchasing four or five machines for its experimental engineering department. The Chapman Valve Mfg. Co., Indian Orchard, Mass., has placed an order with a Cleveland machinery manufacturer for two 24-in. turret lathes. Manufacturers of punching and shearing machinery report some improvement in orders. The demand for forging machinery

is still dull. The Cleveland Board of Education received bids to-day for about 30 metal and wood-working tools covered by a list issued about a month ago.

The Warner & Swasey Co., Cleveland, made a price advance averaging about 10 per cent effective July 1 on its smaller types of turret lathes. No other advances by local manufacturers are reported but with increasing costs some Cleveland machine tool builders state that they will have to mark up prices. There has been some stiffening of wages in Cleveland in the metal working field. Many workmen have gone to Detroit to work in the automobile plants and there is a scarcity of some kinds of skilled labor. Some local automobile plants have commenced to curtail production slightly and are not employing as many men as they were, but other industries are increasing their working forces.

The Broden & Dailey Construction Co., Cleveland, has been organized as a partnership by G. A. Broden and K. T. Dailey and will manufacture wire mill and cold rolling equipment. Mr. Broden was connected with the American Steel & Wire Co., for 15 years as construction engineer and later as assistant superintendent. Mr. Dailey was connected with the engineering department of the Cleveland Machine & Mfg. Co., for 13 years. The company is located in the Union Building, 1836 Euclid Avenue.

The Goldsmith Welding & Engine Co., Canton, Ohio, has recently been organized and will establish a plant at Harrisburgh Road and Sixteenth Street, N. E. It will manufacture welded steel storage tanks, racks and frames and conduct a jobbing department and repair works. V. J. Goldsmith is president and general manager.

The Rose Machine & Spring Co., Canton, Ohio, according to an announcement made by N. J. Rose, president and general manager, has purchased the entire equipment of the Advance Dairy & Machine Co., and will move the equipment of both plants to the building of the Belden Motor Car Co., half of which has been leased. The Rose company manufactures special machinery, dies, tools, fixtures, etc., and does general machine shop work.

The Hoskins Mfg. Co., Detroit, has taken an order from the American Radiator Co. for a 50-kw. furnace for annealing brass which will be installed at the Buffalo works of the Radiator company.

It is reported from Akron that the Telestyle Umbrella Co., Findlay, Ohio, will locate in a plant at Main Street and Buchtel Avenue, Akron. E. A. Ziesloft is president.

The Lewis Electric Co., Minerva, Ohio, has purchased the plant of the Effinger-Menegay Machine & Die Co., Canton, Ohio, and has moved the equipment of the latter company to Minerva.

The Mason Tire & Rubber Co., Kent, Ohio, has purchased the plant of the Owen Tire & Rubber Co., Bedford, Ohio, which went into bankruptcy come time ago. It will be placed in operation shortly.

Cincinnati

CINCINNATI, July 3.

Advances in prices of radial drilling machines ranging from 5 to 7½ per cent were announced, effective July 1, by practically all manufacturers of this type of tool. Increasing costs of production, including iron and steel castings, and the fact that higher wages are being paid to secure competent mechanics, is the reason given. Reports are current that manufacturers of lathes are contemplating similar increases, and one manufacturer has already notified his dealers that a 5 per cent advance would be effective on July 1.

The month of June was not quite up to that of May in the number of orders booked, but ran much ahead of any other month this year. There were no spectacular purchases, most of the orders running to one and two machines. There is, however, a good demand for special machinery for rapid production purposes, one manufacturer reporting the receipt of five machines from an automobile builder. A drilling machine maker booked an order for a multiple spindle machine costing in the vicinity of $13,000. Railroad business is expected to put the machine tool industry on a higher production basis in the near future. The Santa Fe has purchased practically all of its list, the Missouri, Kansas & Texas bought a number of tools, including six radial drills, and the New York Central has also bought several tools. Local dealers report a fair demand for small tools, and used machinery is fairly active.

A noticeable pick-up in the demand for agricultural implements is reported by manufacturers in this district. An Indiana malleable shop which supplies a number of makers with malleable castings is running to capacity and is making tentative plans to increase its output should the demand be sustained. Manufacturers of wood-working and road building machinery are running practically full time.

The Logan, Ohio, car repair shops of the Hocking Valley Railroad will reopen on July 5 after having been closed since last November. About 200 men will be employed.

An automobile hotel, with a capacity of 225 cars and a completely equipped repair shop, will be erected at 308 Walnut Street, Cincinnati, contract having been awarded to the Ferro-Concrete Construction Co. The building will cost approximately $225,000.

The Portsmouth Stove & Range Co., Portsmouth, Ohio, has let contract to the Ferro-Concrete Construction Co., Cincinnati, for an addition to its plant, to cost with equipment $100,000. It has placed an order with the George J. Hagen Co. for the ovens and other equipment.

The auction sale of the plant of the Barney & Smith Car Co., Dayton, Ohio, scheduled for June 28, has been postponed until Wednesday, July 12. It is reported that the bondholders protective committee will bid in the property.

The Marietta Paint & Color Co., Marietta, Ohio, will erect a building, 30 x 82 ft., on Dennison Avenue, Columbus, Ohio, and plans to install a number of storage tanks to take care of its business in that city.

Baltimore

BALTIMORE, July 3.

The New Brick & Tile Co., Moreland Building, Easton, Md., has been organized under State laws with a capital of $50,000 to manufacture hollow tile, etc. A site has been acquired and plans for the initial works are being completed. It will cost close to $45,000, including machinery. The company is headed by Robert L. Kemp, J. Elwood Smith and J. Fletcher Clark.

Motors, controllers, electrical and other equipment will be installed in the new printing plant to be erected by the Register & Bee Publishing Co., Danville, Va., estimated to cost about $80,000. R. A. Jones is president.

The Board of Harbor Commissioners, Wilmington, Del., is perfecting details of the equipment installation at the new marine terminal now in course of construction and which is expected to be ready for service early in 1923. The equipment will include gantry cranes, tractor trailers, locomotives, electric dock winches, etc., with fixed steel Burtoning spans. The storage yard will be provided with a locomotive crane. It will cost $3,410,000.

The Shippers' Compress Co., Atlanta, Ga., has leased a building on Stewart Avenue, and plans the immediate installation of machinery for a cotton compressing plant.

A one-story electric power plant will be constructed by the Ruby Cotton Mills, Inc., Gastonia, N. C., recently organized, in connection with its proposed mill. James A. Page, Clover, S. C., is president.

The Caldwell Power Co., Morganton, N. C., has acquired the plant and property of the Citizens' Light & Power Co., Lenoir, N. C., and has plans under way for extensions and improvements. A. M. Kistler heads the company.

Electric loading and unloading machinery, industrial trucks, conveying equipment, etc., will be installed at the proposed six-story municipal warehouse and pier to be constructed at Locust Point, by the Port Development Commission, Baltimore, Md., estimated to cost about $3,000,000. It will be leased to the W. P. Tanner-Gross Co., 25 Beaver Street, New York. Engineers of the latter company are working with the commission in the preparation of plans.

The Georgia Sand & Gravel Co., Augusta, Ga., recently organized, plans for the installation of screening, washing and other machinery at its plant to develop an output of 500 tons of material per day. E. W. Hancock is general manager.

The South Boston Mfg. Co., South Boston, Va., is planning for the installation of new machinery in its foundry and machine shop. J. L. Watkins is secretary.

The Textile Mill Supply Co., Charlotte, N. C., has filed plans for a new three-story and basement building, totaling about 30,000 sq. ft. of floor space. A machine shop will be installed.

A vocational department will be installed in the new high school to be constructed at Dover, Del., estimated to cost about $200,000.

E. T. Brown, Newmarket, Va., is completing the organization of a new company to construct and operate a hydro-electric power plant on the Pitts Run River.

A vocational department will be installed in the two-story high school to be erected at Western Port, Md., estimated to cost close to $100,000. Charles M. Anderson, 324 North Charles Street, Baltimore, Md., is architect.

A vocational department will be installed at the proposed high school to be constructed at Duke, N. C., by the Duke School District trustees, estimated to cost about $75,000.

An electric power plant will be installed by the White Co., Mebane, N. C., at its furniture factory, to replace present steam operation. Motors and electric-operating equipment will be installed in the different departments. W. E. White is president.

The Youghiogheny Water & Electric Co. and the Youghio-

gheny Power Co., Oakland, Md., affiliated companies, have made application for permission to construct and operate a hydroelectric generating plant on the Youghiogheny River, near Oakland.

The County Board of Education, Salisbury, Md., will install a vocational department in connection with its high school to be erected in the vicinity of Wicomico, estimated to cost approximately $300,000.

The Aerial Transport Corp., Richmond, Va., recently organized with a capital of $2,000,000, is planning for the establishment of a machine repair and construction plant in connection with its proposed aircraft transportation system. Edmund M. Preston is president.

The Columbus Electric & Power Co., Columbus, Ga., has arranged for a bond issue of $1,500,000, a portion of the proceeds to be used for extensions and improvements. C. F. W. Wetterer is president.

The Chief of the Supply Section, United States Veterans' Bureau, Washington, is taking bids until July 10, for one cylinder reboring tool, as specified in circular V-151-M.

Canada

TORONTO, July 3.

The demand for machine tools in this market has shown slow but gradual improvement the past week or two. Large buying, however, is still absent, but a steady call prevails for equipment in single units. Inquiries are also increasing in volume. At present wood-working equipment is furnishing the greater part of the current business, but a slight improvement is reported in equipment for foundries and automobile plants. Among a number of plants in Ontario general industrial activities are said to be increasing and buying for replacement purposes is more pronounced. The demand for small tools remains steady, but shows no improvement over last week.

The Consolidated Mining & Smelting Co. has announced that construction will start immediately on a 500-ton concentrator plant at Kimberley, B. C. It will represent an expenditure of upward of $1,250,000. It is expected to be completed and in operation early in 1923. A. Broderick, Trail, B. C., is architect.

The contract for additions and alterations to a building for the Empire Brass Foundry, 128 Wellington Street, Montreal, has been awarded to W. H. Madigan, 939 Atwater Avenue.

The general contract for an addition to the machine shop for the Canadian Aloxite Co., Montrose, Ont., has been awarded the Robertson Construction Co., Erie Avenue, Niagara Falls, Ont.

The Yarmouth Light & Power Co., Yarmouth, N. S., proposes to erect a hydroelectric power plant. G. St. C. Perrin is engineer.

The Pacific Coast

SAN FRANCISCO, June 29.

The Columbia Steel Co., 503 Market Street, San Francisco, has preliminary plans under way for an addition to its plant at Pittsburg, Cal. W. E. Creed is president.

The Pioneer Rubber Mills, Inc., 68 Sacramento Street, San Francisco, manufacturer of tires and other rubber products, has plans nearing completion for a new plant at Pittsburg, Cal., to cost about $100,000, including machinery. B. G. McDougall, 381 Bush Street, is architect.

The Oil Tool Service Mfg. Co., Anaheim, Cal., has plans in progress for a one-story machine shop and foundry at Santa Ana and Atchison streets. B. D. McAlvay and M. N. Putnam head the company.

A vocational department will be installed in the new high school to be erected at Santa Rosa, Cal., for which bonds totaling $375,000 have been approved. The Board of Education will select an architect to prepare plans.

The Board of Education, El Monte, Cal., has plans under way for a one-story vocational and manual training building at the union high school, 50 x 200 ft., and will call for bids about July 15. E. C. Thorne, 620 Western Mutual Building, Los Angeles, is architect.

The Little Rock Power & Water Co., 615 Chapman Building, Los Angeles, has made application for permission to construct and operate a hydroelectric power plant in Los Angeles County, with capacity of 2450 hp., estimated to cost about $350,000.

The Caladero Products Co., Atascadero, Cal., will commence the immediate erection of a new cold storage and refrigerating plant to cost about $200,000, including machinery.

The Marine Equipment Co., Aberdeen, Wash., has acquired property between Aberdeen and Hoquiam, and has plans under way for a new plant, estimated to cost about $275,000, including machinery.

The Pacific Power & Light Co., Portland, Ore., has selected a site near Hood River, Ore., for its new hydroelectric power plant and will soon commence active work on the initial unit, to have a capacity of about 7,500 hp.

The Commercial Iron Works, Portland, Ore., has filed plans for a one-story works at 360-74 Union Avenue, estimated to cost about $18,000, exclusive of equipment.

The Santa Fe Railroad Co., Kerckhoff Building, Los Angeles, is completing plans for a new reinforced-concrete power house at its shops at San Bernardino, Cal., to cost about $100,000.

The Boston-Idaho Gold Mining Co., Grimes Pass, near Boise, Ida., has preliminary plans under way for rebuilding its electric power house, recently destroyed by fire with loss estimated at close to $100,000.

The Idaho Sash & Door Co., Nampa, Ida., is contemplating the erection of a new plant to cost about $60,000.

Plans of New Companies

The Brunswick Refrigerating Co., New Brunswick, N. J., and the Kroeschell Brothers Ice Machine Co., Chicago, and the Kroeschell Brothers Co., Chicago, have combined as the Brunswick-Kroeschell Co., with main offices at New Brunswick, N. J. For the present, at least, both the New Brunswick and Chicago plants will remain in operation.

The Gable-Christal Co., Sumter, S. C., has recently been organized to manufacture all-metal boll weevil traps. The company has its own factory.

The United Radio Corporation of America, 1210 Michigan Avenue, Chicago, has engaged in the manufacture and wholesaling of radio equipment. All contracts have been awarded.

Clark's Iron Foundry has been incorporated to take over the plant and business of J. Alfred Clark, deceased, Philadelphia. The new organization will not be in the market for new equipment.

The Wilson "Reverso" Window Co., 168 Upper Michigan Avenue, Chicago, is equipping a factory at Elkhart, Ind., including a machine shop, for the manufacture of all types of No. 12 gage steel window frames and sash. The company will make a specialty of the Wilson "Reverso" window both in steel and bronze or extruded metal. President is Harrison D. Wilson; vice-president, Grover H. Ashbrook; treasurer, J. L. Kennedy.

The William Schmitt Co., 80 Twenty-second Street, Irvington, N. J., has taken over the business formerly conducted under the name of Herman Schmitt, and will continue the manufacture of carpenters' and woodworkers' tools in which the latter was engaged.

The Cranston Wire Binding Machine Co., Spokane, Wash., which was recently organized, has contracted with a Spokane manufacturing company to make its machines, and will not for the present undertake the construction and equipment of a plant of its own.

The Davis-Jones Insulated Wire Co., whose temporary offices are at 216 Main Street, Pawtucket, R. I., will manufacture national electrical code standard wires and cables, also flexible lamps and portable cords, including such items as heater cords, silk covered cords, armored cords for automobile lighting purposes and radio head set cords. The company has purchased land and buildings in Phillipsdale, R. I., and has purchased considerable machinery for its plant, which will be in operation about Aug. 15.

The Radio Appliance Mfg. Co., 6282 Beaubien Street, Detroit, manufacturer of radio equipment, was recently incorporated.

The Standard Welding Co., 665 South Water Street, Providence, R. I., Harry T. Prince, president, has outgrown its present manufacturing quarters and expects to build a new plant or addition within the near future. No definite plans have been made, however, for such expansion.

The American Nut Co., 343 Lenox Avenue, Detroit, has been incorporated with capital stock of $25,000 to manufacture bolts, nuts and screw machine products. Equipment has been purchased.

The Keystone Friction Hinge Co., Williamsport, Pa., has been incorporated by V. C. Luppert, who has conducted the business under his sole ownership for the past 15 years. The incorporation is for the purpose of taking in as partners some of the older employees of the business. The company manufactures furniture hardware.

The K. I. Willis Corporation, Moline, Ill., is the new corporate name for the manufacturing business which has been conducted in that city by the Willis & Sons Co. The company makes elevator cups, mill supplies and sheet iron specialties.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

	Per Lb.
Bars:	
Refined iron bars, base price	2.58c.
Swedish bars, base price	7.00c.
Soft steel bars, base price	2.58c.
Hoops, base price	3.63c.
Bands, base price	3.23c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	2.68c.
Channels, angles and tees under 3 in. x ¼ in., base	2.58c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	2.60c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	2.80c.
Toe-calk, ½ x ⅝ in. and larger	3.40c.
Cold-rolled strip, soft and quarter hard	6.25c. to 7.25c.
Open-hearth spring steel	3.50c. to 6c.
Shafting and Screw Stock:	
Rounds	3.35c.
Squares, flats and hex	3.85c.
Standard cast steel, base price	12.00c.
Extra cast steel	17.00c.
Special cast steel	22.00c.

Tank Plates—Steel

¼ in. and heavier	2.68c.

Sheets

Blue Annealed

	Per Lb.
No. 10	3.63c.
No. 12	3.68c.
No. 14	3.73c.
No. 16	3.83c.

Box Annealed—Black

	Soft Steel C. R., One Pass, Per Lb.	Blued Stove Pipe Sheet, Per Lb.
Nos. 18 to 20	4.00c. to 4.30c.	.....
Nos. 22 and 24	4.05c. to 4.35c.	4.60c.
No. 26	4.10c. to 4.40c.	4.65c.
No. 28	4.20c. to 4.50c.	4.75c.
No. 30	4.45c. to 4.75c.	.....

No. 28 and lighter, 36 in. wide, 10c. higher.

Galvanized

	Per Lb.
No. 14	4.30c. to 4.60c.
No. 16	4.45c. to 4.75c.
Nos. 18 and 20	4.60c. to 4.90c.
Nos. 22 and 24	4.75c. to 5.05c.
No. 26	4.90c. to 5.20c.
No. 27	5.05c. to 5.35c.
No. 28	5.20c. to 5.50c.
No. 30	5.70c. to 6.00c.

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
½ in. Butt..	—56	—40	¾ in. Butt..	—30	—13
¾ in. Butt..	—61	—47	1½ in. Butt..	—32	—15
1-3 in. Butt..	—63	—49	2 in. Lap.....	—27	—10
3½-6 in. Lap.	—60	—46	2½-6 in. Lap.	—30	—15
7-8 in. Lap..	—56	—34	7-12 in. Lap..	—23	— 7
9-12 in. Lap.	—55	—33			

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	3.50c. to 3.75c.
Annealed soft	3.50c. to 3.75c.
Galvanized annealed	4.25c. to 4.50c.
Coppered basic	4.00c. to 4.25c.
Tinned soft Bessemer	5.50c. to 5.75c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	16¾c. to 17¼c.
High brass wire	17¼c. to 17¾c.
Brass rod	14¾c. to 15¾c.
Brass tube, brazed	23¾c. to 24½c.
Brass tube, seamless	20 c. to 20½c.
Copper tube, seamless	22¼c. to 23¼c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 20¾c. to 21¾c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14-20	
			Primes / Wasters
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	80 lb..	$6.05 / $5.80
		90 lb..	6.15 / 5.90
		100 lb..	6.25 / 6.00
IC..	$10.00 / $8.50	IC..	6.40 / 6.15
IX..	11.50 / 10.00	IX..	7.40 / 7.15
IXX..	13.00 / 11.25	IXX..	8.40 / 8.15
IXXX..	14.25 / 12.50	IXXX..	9.40 / 9.15
IXXXX..	16.00 / 14.00	IXXXX..	10.40 / 10.15

Terne Plates

8-lb. coating, 14 x 20

100 lb.	$7.00
IC	7.25
IX	7.50
Fire door stock	9.00

Tin

Straits, pig	33½c.
Bar	40c. to 44c.

Copper

Lake ingot	15¼c.
Electrolytic	15 c.
Casting	14¾c.

Spelter and Sheet Zinc

Western spelter	6¾c. to 7c.
Sheet zinc, No. 9 base, casks	8½c. open 9c.

Lead and Solder*

American pig lead	6¾c. to 7c.
Bar lead	8c. to 8½c.
Solder, ½ and ½ guaranteed	25c.
No. 1 solder	23½c.
Refined solder	20¼c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	75c.
Commercial grade, per lb	35c.
Grade D, per lb	25c.

Antimony

Asiatic	6½c. to 7c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb	25c. to 27c.

Old Metals

The market continues firm but has been quiet this week. Dealers' buying prices are nominally as follows:

	Cents Per Lb.
Copper, heavy crucible	11.75
Copper, heavy wire	11.25
Copper, light and bottoms	9.00
Brass, heavy	6.00
Brass, light	5.00
Heavy machine composition	8.50
No. 1 yellow brass turnings	6.25
No. 1 red brass or composition turnings	7.75
Lead, heavy	4.50
Lead, tea	3.25
Zinc	2.75

THE IRON AGE

New York, July 13, 1922

ESTABLISHED 1855 VOL. 110 No. 2

Trend of Basic Business Conditions

Present Situation Similar, in Volume of Activity, to 1920— March Saw a Distinct Emergence from the Influence of the Slump

WHILE it has been generally recognized that the steel industry was harder hit by the slump of 1921 than business in general, there has been little opportunity to make a direct comparison between the way in which the two were incapacitated. Figures now being given out each month, however, by the Department of Commerce, under Mr. Hoover's direction, and covered under the heading "Survey of Current Business," permit a study over a considerable period of time of the production of most of the basic commodities. Making use of these figures, and particularly of the relation which they bear to production of the same items at earlier dates, we may obtain a gage of business conditions in general, rather than in terms of one industry.

Ten basic groups of items were taken for the study. These are food, building, textiles, fuel, vehicles, leather, lumber, steel, non-ferrous metals and paper. Seven of the ten items are further sub-divided. Thus, food is a composite of beef, flour and sugar; textiles is a composite of cotton, wool and silk; fuel is a composite of bituminous and anthracite coal and petroleum; vehicles include both automobiles and trucks; leather is a composite of belting and sole leather; lumber includes yellow pine, Douglas fir and Northern hardwood; the non-ferrous metals include copper, lead and zinc.

This makes a total of twenty-two items under study, of which three are separate items, while the other nineteen are in groups, each group working into a single item in the major list. The figures were carried back to the beginning of 1920, from which date, with a few exceptions, all of the items could be shown. The chart on this page gives an indication of the general course of production during the period of two years and a half covered by the survey. It will be noted that the high point was reached in March of 1920, when the figure stood at 126, this being a comparison with previous figures, most of them carried

In the Solid Curve Is the Story of Productive Activity in the United States, as Measured by Ten Basic Industries. The dotted line tells the same story, but with the component items weighted in accordance with their relative quantities

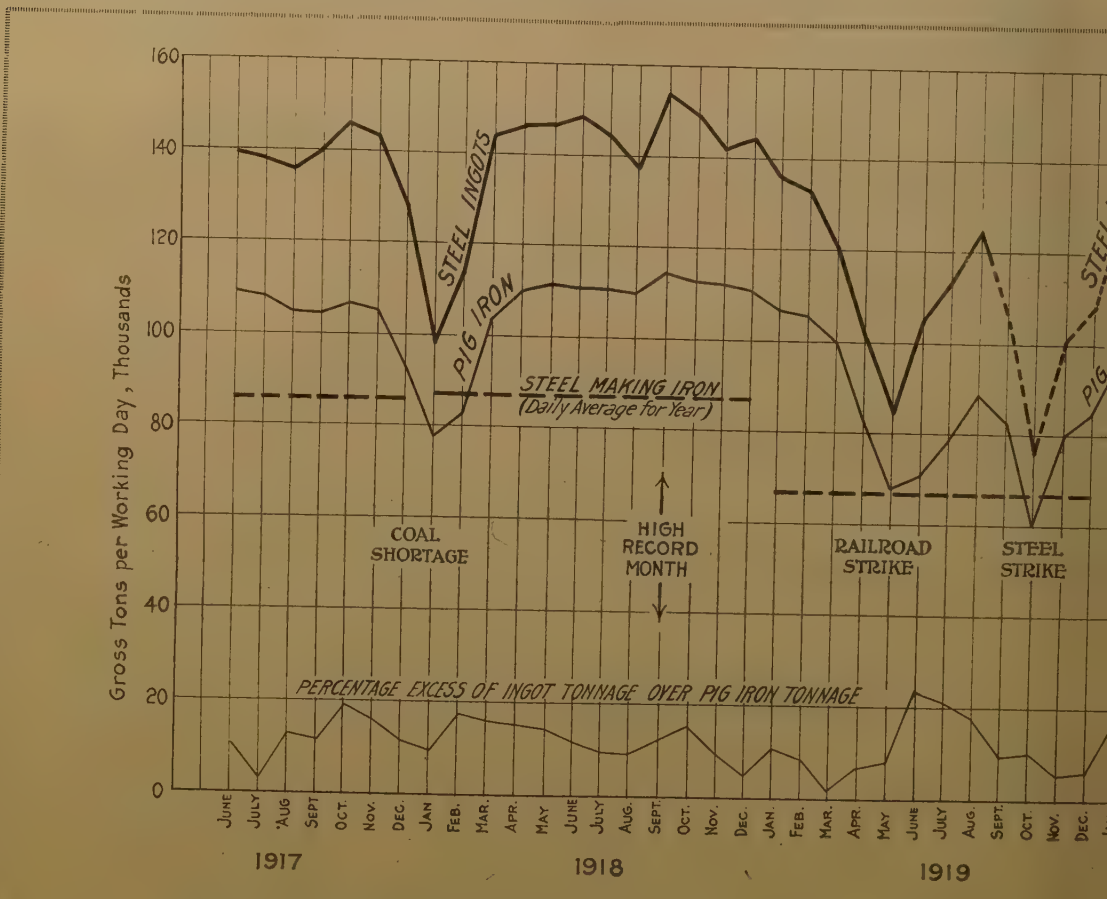
back to the year 1913. From March, 1920, the production of commodities fell, with few interruptions, until February of 1921, at which time the figure stood at 72. That was the low point of production, according to composite business curve shown in the chart and, although there have been both ups and downs since then, it will be noted that for the greater part of 1921 production ranged between 80 and 90. It first got above the 100 per cent mark again in March of the current year; the coal strike, coming in April, brought it back almost to the 100 per cent line, but it has since recovered handsomely. The present figure stands at 113½.

All of the figures on which the solid curve is based are averaged up, without any attempt to give any one figure a greater weight than any other; that is, the figures for the ten major items are added together and the sum divided by ten. The dotted curve, on the other hand, tells the same story, but with the figures weighted in accordance with the financial importance of the various industries covered by the survey. It is surprising how closely the two curves cling together throughout the entire range of thirty months.

During the falling period from March, 1920, to February, 1921, and for some little period thereafter, the weighted curve is consistently below the non-weighted curve. This shows that the items of production which were hardest hit by the slump and shortage of business were those of largest importance and largest size. As the same items appear to have been the quickest to recover from the condition prevailing throughout the summer of 1921, it is apparent that the large items are the ones which are leading in the resumption of business activity.

Careful study of the curves, together with the individual figures from which they are made up, shows some of the outstanding elements which have caused sharp fluctuations. Thus, the peak in March, 1920, was due to a sudden spurt both in building construction and in the production of automobiles, as well as several other items. Similarly, other peaks and hollows throughout the remainder of the curves may be traced down to separate individual prominent causes which produced these divergences from the general line. No allowance was made for increasing population.

It must be remembered, in consulting such a curve as is shown here, that the activity is expressed as a percentage of the activity during a previous period of time. It bears no relation whatever to capacity. It takes no account of increased productive capacity provided during the intervening years. Most of the data from which this curve was prepared are based on the 1913 output of the various commodities presented. Some of them, where the earlier figures are not available, are based on 1917 or even as late as 1919. In each case the basing figure is the average monthly output for the year in question. The use of 1913 in this connection is particularly fortunate, insofar as it has been used, because 1913 was a year of considerable activity, but was not a boom year. It was the first year in which pig iron production in the United States passed the 30,000,000 ton mark. Many other items besides iron and steel made new records in 1913 and business generally was good.



Production of Steel Ingots in the United States, Month by Month, for the Five Years During W are expressed in gross tons per working day. The pig iron curve is shown, for comparison.

United States Production of Steel Ingots

Figures Given Include Estimates for the Months of the 1919 Steel Strike—Daily Output Calculated for Each Month of Past Five Years

SINCE early summer of 1917 figures have been compiled by the American Iron and Steel Institute showing the production of steel ingots, month by month, of a number of producing companies. This number, 29 at first, is now 30. The companies so reporting have been producing, from year to year, about 85 per cent of the total ingot output of the country.

It has been customary among those studying these figures to assume that the production of the non-reporting companies has been, each month, about in the same proportion to the total as the ascertained figure for the full year. This assumption, which cannot be far in error, has given rise to a series of monthly figures which are presumably very close to the actual ingot output of the United States.

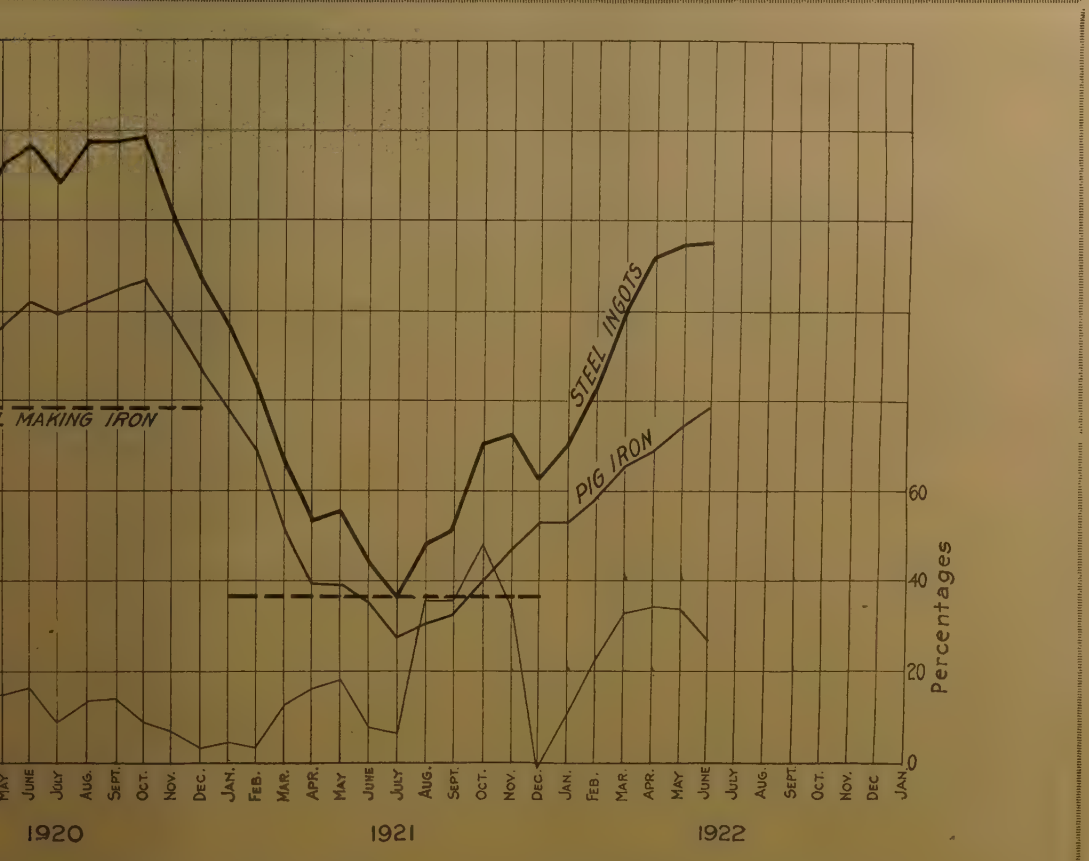
On this basis it has been possible to make up, for seven months of 1917, all of 1918, the first eight months of 1919 and all of 1920 and 1921, figures which must be very near the actual total monthly ingot production. The first five months of 1917 were not reported upon. The last four months of 1919 were the months covered by the steel strike, during which the figures were not reported. The first six months of 1922 have been estimated on the basis of the ascertained ratio of 1921, between the reporting companies and the total.

It has been found possible to fill in the gap in the latter part of 1919 by estimates in which the daily production of the mills during those four months is assumed proportional to the known average daily production of pig iron, month by month, during those same four months. The first eight months of the year were calculated on the usual basis, that the output of the 30 companies bore the same relation to the total as for the full year, thus giving a total apparent production for those eight months, by the entire United States, of 23,633,618 gross tons, out of the reported total for the year of 33,694,795 tons. This left a difference of 10,061,177 tons to be distributed among the last four months of the year. This has been done, and the distributed figures work out as follows:

	Ingot Production	Working Days	Tons Per Day
September	2,718,062	26	104,541
October	2,046,030	27	75,779
November	2,513,083	25	100,523
December	2,784,002	26	107,077
Total	10,061,177	104	96,742*

*Average.

In order that a measure may be had of the production of steel ingots, month by month, for the period beginning with June, 1917, the table appended is printed,



Have Been Collected. Figures Covering the period of the steel strike have been estimated; all curve shows the percentage by which ingot tonnage, each month, exceeds pig iron tonnage.

giving the reported tonnage, the apparent monthly tonnage of the whole United States, the number of working days each month, and the daily tonnage of steel ingot output. These figures for daily tonnage

Steel Ingot Output of United States

1917 (a)	Reported Tonnage	Apparent Total	Working Days	Gross Tons per Day
June	3,083,929	3,617,361	26	139,129
July	2,939,115	3,447,499	25	137,900
August	3,123,217	3,663,445	27	135,683
September	2,972,259	3,486,376	25	139,455
October	3,351,935	3,931,725	27	145,619
November	3,166,257	3,713,930	26	142,859
December	2,733,722	3,206,579	25	128,263
Year	37,187,325	43,619,200*	311	140,255
1918 (b)				
January	2,203,845	2,641,195	27	97,822
February	2,273,741	2,724,962	24	113,540
March	3,110,381	3,727,632	26	143,370
April	3,163,410	3,791,184	26	145,815
May	3,287,233	3,939,580	27	145,910
June	3,083,446	3,695,351	25	147,814
July	3,113,635	3,731,531	26	143,520
August	3,083,680	3,695,631	27	136,875
September	3,197,658	3,832,228	25	153,289†
October	3,352,196	4,017,435†	27	148,794
November	3,060,760	3,668,164	26	141,083
December	2,992,306	3,586,129	25	143,445
Year	35,922,291	43,051,022*	311	138,425
1919 (c)				
January	3,107,778	3,651,055	27	135,224
February	2,704,683	3,177,493	24	132,396
March	2,662,265	3,127,661	26	120,295
April	2,239,711	2,631,239	26	101,202
May	1,929,024	2,266,241	27	83,935
June	2,219,219	2,607,165	25	104,287
July	2,508,176	2,946,635	26	113,332
August	2,746,081	3,226,129	26	124,082
September	.....	2,718,062	26	104,541
October	.....	2,046,030	27	75,779
November	.....	2,513,083	25	100,523
December	.....	2,784,002	26	107,077
Year	.....	33,694,795*	311	108,343
1920 (d)				
January	2,968,102	3,524,025	27	130,519
February	2,865,124	3,401,759	24	141,740
March	3,299,049	3,916,958	27	145,073
April	2,638,305	3,132,469	26	120,480
May	2,883,164	3,423,178	26	131,661
June	2,980,690	3,538,970	26	136,114
July	2,802,818	3,327,783	26	127,992
August	3,000,432	3,562,410	26	137,016
September	2,999,551	3,561,364	26	136,976
October	3,015,982	3,580,873	26	137,726
November	2,638,670	3,132,890	26	120,496
December	2,340,365	2,778,713	26	106,874
Year	34,432,252	40,881,392*	312	131,030
1921 (e)				
January	2,203,186	2,517,048	26	96,810
February	1,749,477	1,998,704	24	83,279
March	1,570,978	1,794,777	27	66,473
April	1,213,958	1,386,897	26	53,342
May	1,265,850	1,446,181	26	55,622
June	1,003,406	1,146,349	26	44,090
July	803,376	917,823	25	36,713
August	1,138,071	1,300,199	27	48,156
September	1,174,740	1,342,092	26	51,619
October	1,616,810	1,847,138	26	71,044
November	1,660,001	1,896,482	26	72,942
December	1,427,093	1,630,394	26	62,707
Year	16,826,946f	19,224,084*	311	61,814
1922		(g)		(g)
January	1,593,482	1,820,487	26	70,019
February	1,745,022	1,993,616	24	83,067
March	2,370,751	2,708,484	27	100,314
April	2,444,513	2,792,755	25	111,710
May	2,711,141	3,097,366	27	114,717
June	2,634,477	3,009,800	26	115,761
Half-year	13,499,386	15,422,508	155	99,500

*Official total, reported by American Iron and Steel Institute.
†Highest figure ever reached.
a—29 companies produced 85.25 per cent of the total.
b—30 companies produced 83.44 per cent of the total.
c—30 companies produced 85.12 per cent of the total.
d—30 companies produced 84.21 per cent of the total.
e—30 companies produced 87.53 per cent of the total.
f—Subject to minor revision.
g—Estimates for 1922 are on the same basis as the known ratio for 1921. This gives a figure which is probably somewhat below the actual tonnage.

are plotted on the chart, upon which, for comparative purposes, the daily tonnage of pig iron production, month by month, is also plotted. Horizontal broken lines, each covering a period of one year, show the average production for the year of steel-making iron, as reported at the close of the year by the American Iron and Steel Institute. It is unfortunately impossible to apportion this iron among the months, as reports are made annually and not monthly. It is also not feasible to show the steel-making iron from steel works furnaces as a companion curve because, as it happens, this would not include all of the steel-making iron of the country, as it would omit the important but variable contributions of some of the merchant furnaces.

It should be noted that the only holidays taken into consideration, in figuring out the number of working days in the month, are Christmas and Independence Day. Some of the steel companies close the steel-making departments on Labor Day also, but the practice is not general. In a few cases other holidays are recognized when the demand for steel is light. It is evident from this that strictly exact daily tonnage figures could not be obtained without weighting the companies according to output, and using as divisor a figure, with fraction, representing the proportion of tonnage capacity operating on a holiday not generally observed.

One interesting coincidence lies in the fact that the last nine months of 1920 and January, 1921, ten months in all, show 26 working days in each month. It happened that each 30-day month of that period had four Sundays; each 31-day month had either five Sundays or four Sundays and a holiday. At the end of 1921 there are five successive 26-day months, but no other group larger than three in succession was observed within the five years covered by the survey.

At the bottom of the diagram appears a third curve showing the percentage of excess of the ingot tonnage over the pig iron tonnage. This is based on monthly figures and not on the daily figures shown in the curves above. It is interesting to note that, prior to the summer of 1921, there was only one period when the ingot tonnage was as much as 20 per cent greater than the pig iron tonnage, that being during June and July of 1919. The great excess of ingot tonnage coming in the fall of 1921 was compensated for in December by an excess of 1 per cent of pig iron tonnage over ingots. At the same time, it must be recognized that the large excess during the past few months, with the exception of December and January, represents a large and increasing use of scrap in the making of steel.

JUNE STEEL OUTPUT

Ingot Production Rate Over 36,000,000 Tons Per Annum—Daily Output Over 1,000 Tons More Than in May

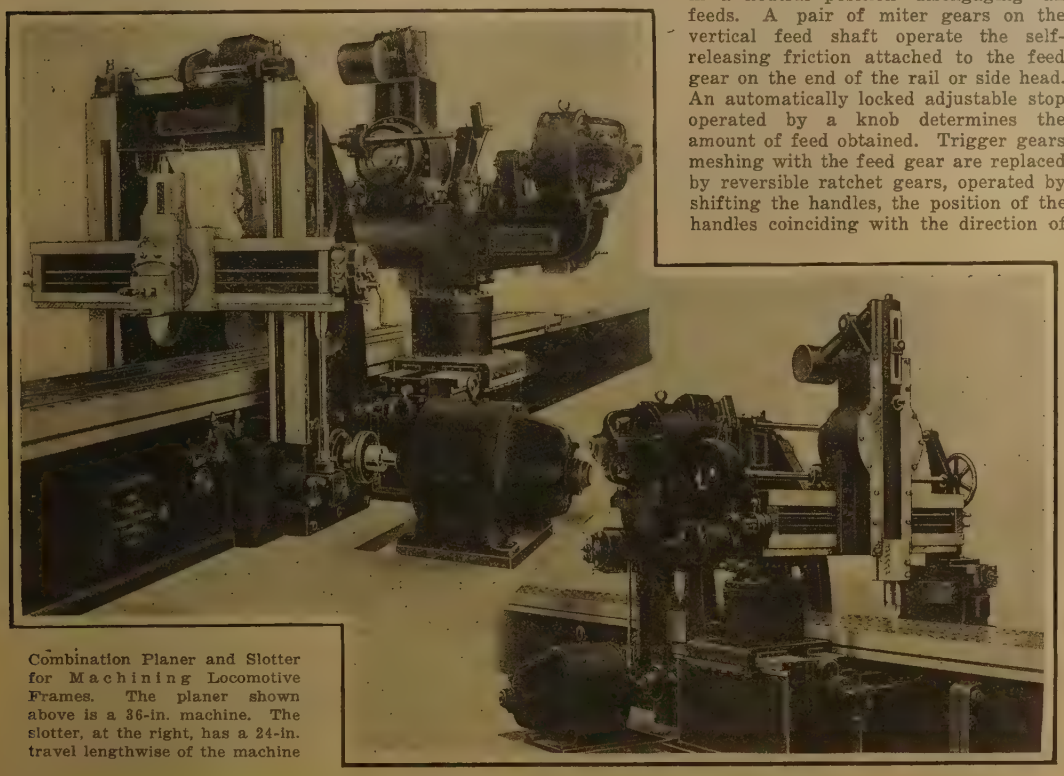
The accompanying table gives the steel ingot statistics as collected by the American Iron and Steel Institute. These show that the 30 companies which in 1921 made 87.50 per cent of the total had an output in June of 2,634,477 tons. This is less than the total for May of 2,711,141 tons, but in May there were 27 working days. On the assumption that companies reporting are supplying the same percentage of the total as they did last year, (though the percentage may be less) the output for the 26 working days of June is about 3,010,000 tons or approximately 115,800 tons per day.

Months	Open-Hearth	Bessemer	All Other	Total
January, 1921	1,591,281	608,276	3,629	2,203,186
February	1,295,863	450,818	2,796	1,749,477
March	1,175,591	392,983	2,404	1,570,978
April	1,000,053	211,755	2,150	1,213,958
May	1,047,810	216,497	1,543	1,265,850
June	808,286	193,644	1,476	1,003,406
Total 6 months	6,918,884	2,073,973	13,998	9,006,855
July	689,489	113,312	575	803,376
August	915,334	221,116	1,621	1,138,071
September	908,381	265,152	1,207	1,174,740
October	1,269,945	345,837	1,028	1,616,810
November	1,294,371	363,912	1,718	1,660,001
December	1,129,174	296,380	1,539	1,427,093
Total whole yr.	13,125,578	3,679,682	21,686	16,826,946
January, 1922	1,260,809	331,851	822	1,593,482
February	1,395,835	348,571	616	1,745,022
March	1,918,570	451,386	795	2,370,751
April	1,997,465	445,939	1,109	2,444,513
May	2,214,774	494,893	1,474	2,711,141
June	2,143,708	487,851	2,918	2,634,477
Total 6 months	10,931,161	2,560,491	7,734	13,499,386

PLANER AND SLOTTER

Combination Unit for Locomotive Frames Reduces Machining Time—Floor Space Saved—Features Outlined

A combination planer and slotter for machining locomotive frames and which is claimed to reduce the actual machining time more than 50 per cent has been brought out by the Liberty Machine Tool Co., Hamilton, Ohio. In addition to saving floor space, time is saved in handling the work from one machine to another, and setting-up time is reduced to a minimum.



Combination Planer and Slotter for Machining Locomotive Frames. The planer shown above is a 36-in. machine. The slotter, at the right, has a 24-in. travel lengthwise of the machine

The planer is of the company's standard 36 in. pattern, and incorporates the patented features and safety appliances of the standard machine. Although shown with one head on the cross rail the machine is arranged with four heads if required.

The bed is of box type with closed top between the V's, which have ample spread to eliminate unnecessary overhang of the table. They are fitted with automatic oil rollers to assure adequate lubrication. The table T-slots are planed from the solid and reamed holes are provided throughout the length for clamping. The housings extend to the floor and are attached to the bed with taper plugs and bolts. The cross rail is well braced at the back and made to accommodate two heads, allowing either head to have full traverse across the table. The elevating screws are adjustable from the top and are supported on ball bearings. The heads have long and wide bearing surfaces on the cross rail and are made right and left for close range. They are graduated for swiveling up to 90 deg. and have automatic feeds in all directions, operative from either end of the cross rail. The down feed screws under strain are in tension. The slides are hung on ball bearings and binder screws are provided on both saddles and slides. Micrometer adjustments are incorporated on all vertical and horizontal feed screws.

The elevating device is centrally located on the top brace and is self-contained. The long handle at the side of the housing operates a saw-tooth clutch for raising or lowering the cross rail, the handle being held in position while operating. Any obstruction instantly disengages the clutch. All gears are idle when not in use. Side heads can be attached and are counterbalanced, and moved below the top of table when not in use. The feed micrometer collars and control handles are conveniently located on the heads and move up and down with them. They are graduated for swiveling up to 90 deg.

In the patented feed arrangement the power is transmitted from a spur gear on the end of the bull pinion shaft, through a pair of reversing miter gears to a vertical splined feed shaft. A handle conveniently located determines whether the feed is to take place on the cutting or return stroke, the placing of the handle in a neutral position disengaging all feeds. A pair of miter gears on the vertical feed shaft operate the self-releasing friction attached to the feed gear on the end of the rail or side head. An automatically locked adjustable stop operated by a knob determines the amount of feed obtained. Trigger gears meshing with the feed gear are replaced by reversible ratchet gears, operated by shifting the handles, the position of the handles coinciding with the direction of the feed. Among the advantages claimed for the feed are that the operator can control or change the feed on the rail heads without stopping the machine or disturbing the feeds on either right or left side heads, or vice versa. All parts are well protected, yet easily accessible, and operating handles and knobs are conveniently located. The amount of feed is indicated by a dial which permits the operator to set the feed to the proper amount.

The driving pulleys are of aluminum with cast-iron centers and the loose pulleys have wick-oiled bronze bushings and solid web. Shifting levers located on both front and rear sides of the machine permit the operator to control the motion of the table without walking around the planer.

The slotter, shown in the separate illustration, is self-contained and furnished with a base which is bolted and dowelled to the bed. It is provided with a variable speed motor giving the necessary range of speed, and two additional small motors, which furnish the power for quick movement of the rail and head. The slotter has a 24-in. travel lengthwise of the machine and is provided with independent automatic feed and rapid traverse in both directions. The cross rail can be swiveled in either direction to any angle within the limits of locomotive frame work, and can also be swiveled entirely out of the way. The head has an independent automatic feed and rapid traverse in both directions.

The ram is driven by an improved worm and worm

wheel through a crank disk and connecting rod, and the stroke is adjustable both for position and length. Notched washers fasten the connecting rod when set. A special tool bar is provided for circular feeding and for cutting fillets. The table is held stationary when using the slotter and is rapidly set with pendant switch for the next position after finishing the cut. Adequate oiling facilities and adjustments for wear are provided throughout and ball bearings and adjustments for wear provided where necessary.

The maximum stroke of the slotter is 14 in., the clearance in the yoke being 37 in. wide and 18 in. high. The maximum length of work accommodated is 30 ft. and the travel of the rail 24 in.

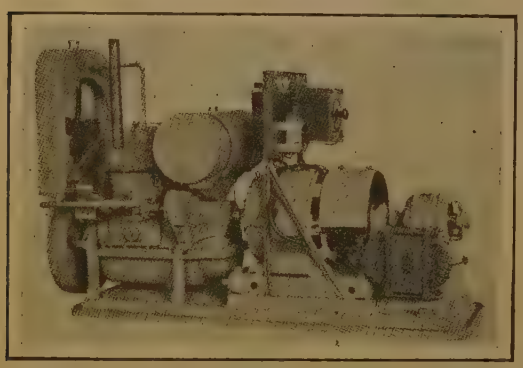
The width between the housings of the planer is 37 in., the maximum height under the cross rail being also 37 in. The length of the planer table is 38 ft. and the width 30 ft., the bed being 69 ft. long and 27 in. deep. The distance between the Vees is 20 in. The face of the housings is 8 in. and that of the cross rail 14 in. The horsepower required for the planer is 15 hp. and for the slotter 10 hp. The driving belts are 3 in. wide.

The weight of the machine is 69,000 lb. The floor space overall is 78 ft. long by 10 ft. 2 in. wide and the height 10 ft. 11 in. overall.

Engine-Driven Welding Equipment

An engine-driven welding equipment for use where electric power for motor drive is not available and for job welders who must work in widely scattered districts has been developed by the Westinghouse Electric & Mfg. Co. One advantage of this apparatus, which is made in stationary and portable models, is that it is not necessary to waste time applying for a permit or making proper connections before work can be started.

The equipment consists of a Westinghouse single-operator welding generator geared to a Doman four-cycle, two-cylinder, low speed, marine-type gasoline engine. The generator is direct current, has a rated capacity of 175 amp. and a maximum capacity of 225 amp. at 1750 r.p.m. The generator is designed to operate at arc voltage, and to inherently stabilize the arc and supply a substantially constant current of different values over the working range of 90 to 225



Gasoline-Engine-Driven Welding Equipment. The maximum capacity of the generator is 225 amp.

amp. The operating characteristics of the generator are said to be such that it is unusually easy for the operator to strike and maintain the arc, and also to obtain the deep penetration and thorough fusion necessary for satisfactory welding. The shaft of the generator extends through the pedestal bearing and is connected by means of a flexible coupling to the exciter.

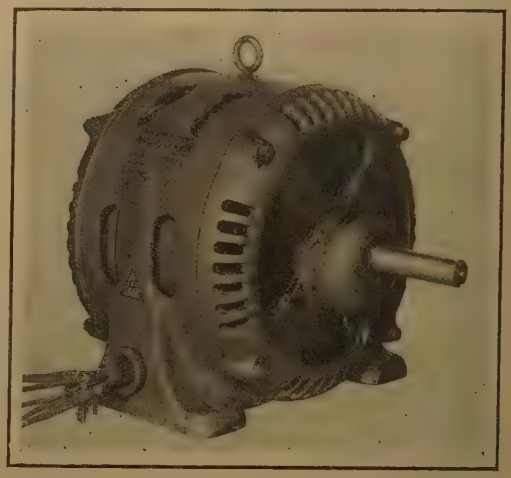
The engine is of rugged construction. The cylinder block and removable head are of semi-steel and the valves, main bearings, and connecting rod bearings are of liberal dimensions for the service. Other features of the engine are forced feed system of lubrication, Wheeler-Schebler carburetor, Taco throttle governor, impulse starter and large honey-comb type radiator.

The control panel is mounted directly over the generator on a rigid, light weight angle iron frame work, and the entire equipment is mounted on a substantial cast-iron bed plate.

New A. C. Motor for Machine Drives

A new line of Watson alternating-current multi-speed motors, providing speeds of 600, 720, 900 and 1200 r.p.m., has been placed on the market by the Mechanical Appliance Co., Milwaukee. The line is intended to make available effective individual alternating-current drive for machine tools, blowers, conveyors, compressors and other machines which previously were driven only by direct-current motors.

Standard four-speed windings for alternating-current motors have been 600, 900, 1200 and 1800 r.p.m. on 60 cycle circuits, the two higher speeds being twice the lower. The introduction of the 720 r.p.m. speed constitutes an important advance in the design



Multi-Speed Alternating Current Motor. The speeds are 600, 720, 900 and 1200 r.p.m.

of alternating current motors, it is pointed out, the wide speed gaps which have an objection to the use of alternating current motors for machine drive being eliminated, as also speed duplication and complicated gear changes to obtain intermediate speeds. The 720 r.p.m. speed step is possible, it is claimed, by the company's standardized practice of using an independent winding on the stator for each speed. Increments of 20, 25 and 33 1/3 per cent are obtained.

The new motors are of the squirrel-cage type and are rated on the 40 deg. basis, carrying the full-rated load indefinitely without exceeding 40 deg. rise. It is claimed that an overload of 25 per cent will be carried two hours with a temperature rise not exceeding 55 deg. C. The motors will be furnished for constant horsepower, constant torque or combinations of both in two, three or four speeds, selected from 600, 720, 900, 1200 and 1800 r.p.m. for 60 cycle circuits. The same ratings will be furnished for other frequencies, likewise two phase.

Suitable control apparatus has been developed and is offered for both automatic and remote control, equipped with the protective apparatus.

The Dort Motor Car Co., Flint, Mich., is increasing operations at its plant, with June output showing an advance estimated at 20 per cent over May production. This last noted month showed a gain of 156 per cent over the month of May, 1921, and of 374 per cent for the same month in the year preceding. Orders on hand insure capacity operations throughout the summer.

June wage distribution of $4,687,976 by Youngstown, Ohio, industries was the largest in the past 16 months, topping the May disbursement by $445,000.

British Open-Hearth Furnace Practice

Higher Temperatures and More Rapid Working Aimed at in the Proposed Design of a 100-Ton Furnace—Reduction of Heat Losses a Great Desideratum

CHANGES in open-hearth furnace design which will give larger outputs through more rapid and more complete combustion have been under consideration simultaneously both in the United States and Great Britain. Open-hearth practice has been the subject of important papers at the last two meetings of the American Iron and Steel Institute, and at the May meeting of the Iron and Steel Institute (British) in London the principal paper was that of Fred Clements of the Park Gate Iron Works, Rotherham, Yorkshire, on "British Siemens Furnace Practice." The author, in introducing his paper, which is really a volume on open-hearth furnace construction and operation, referred to the fact that many new open-hearth furnace installations have been made in Great Britain in the past few years. While these new furnaces showed a growing appreciation of the need of better mechanical detail in furnace construction they followed well established precedents as far as proportions are concerned, and, in the author's opinion, did not show any material advance in thermal efficiency over what has been obtained in older plants.

With a view to formulating some of the principles which govern the design of regenerative furnaces, Mr. Clements made a series of tests at Park Gate, and a section of his paper is devoted to data obtained by thorough analysis of the work done in the 60-ton furnaces of the Park Gate Iron & Steel Co. These voluminous data accompany the paper in the form of charts dealing with temperatures, fuel and air consumption, furnace charge, chemical and heat balance of furnace charge, heat balance of furnace, details of regenerators and ports, production results, recovery of heat from chimney gases, etc. Details were given also in the charts of construction and performance of other important open-hearth plants in Great Britain.

Higher Temperatures and Refractories

Another section of the paper takes up in detail the design of a furnace of 100 tons capacity embodying the principles outlined by the author in his comments on the performance of the 60-ton furnaces at Park Gate. The author emphasizes the necessity of higher temperatures and the new design he proposes is with a view to providing against the more drastic effects of high temperatures upon refractory materials. By recognizing the following principles in design he held that the refractories would be subjected to conditions not more severe than those obtaining at present:

1 The gas and air must be regenerated to a sufficiently high temperature, intimately mixed, and then projected into the furnace at an angle which will insure their passing along the surface of the metal, and at such a velocity as will maintain them in the line of direction desired and in close contact with the contents of the bath. There will be little tendency for the flame to rise to the upper regions of the furnace.

2 The distance between the port blocks must be great enough to insure that combustion is fully complete before the gases closely approach the outgoing ports.

3 The distance of the roof and side walls from the zone of highest temperature must be increased so as to provide against the possibility of the burning gases impinging on the refractory. The space between the stream of gases in combustion and the roof is considered to be occupied by an almost immobile mass of inert gas. The function of this gas is to reduce the heat effect on the refractories.

[It may be noted that the more rapid operation of open-hearth furnaces in the United States that has been obtained in the past year has been greatly assisted by the production of refractories that will stand much higher temperatures than have been customary heretofore.—EDITOR.]

In considering the heat contributed by the exothermic reactions in the working of the charge, Mr. Clements proposes accelerating these reactions by raising the temperature ruling in the bath. The effect of this would be cumulative, in that the quicker the elements are removed the greater the amount of heat generated per unit of time. Three important results would follow, according to the author: The slag would be maintained in a more fluid and workable condition; the time of working would be reduced, and greater advantage would be taken of the heat of chemical reaction.

Referring generally to the factors involved in providing an efficient system of regeneration, Mr. Clements mentions the following:

1 The shape and dimensions of the chamber should be such that the gases during regeneration or recuperation are evenly distributed over the whole of the checkerwork, thus bringing all parts of it into service.

2 The weight of suitable brickwork provided to form the checkering should be sufficient to insure a store of heat ample for regeneration without a wide range of temperature.

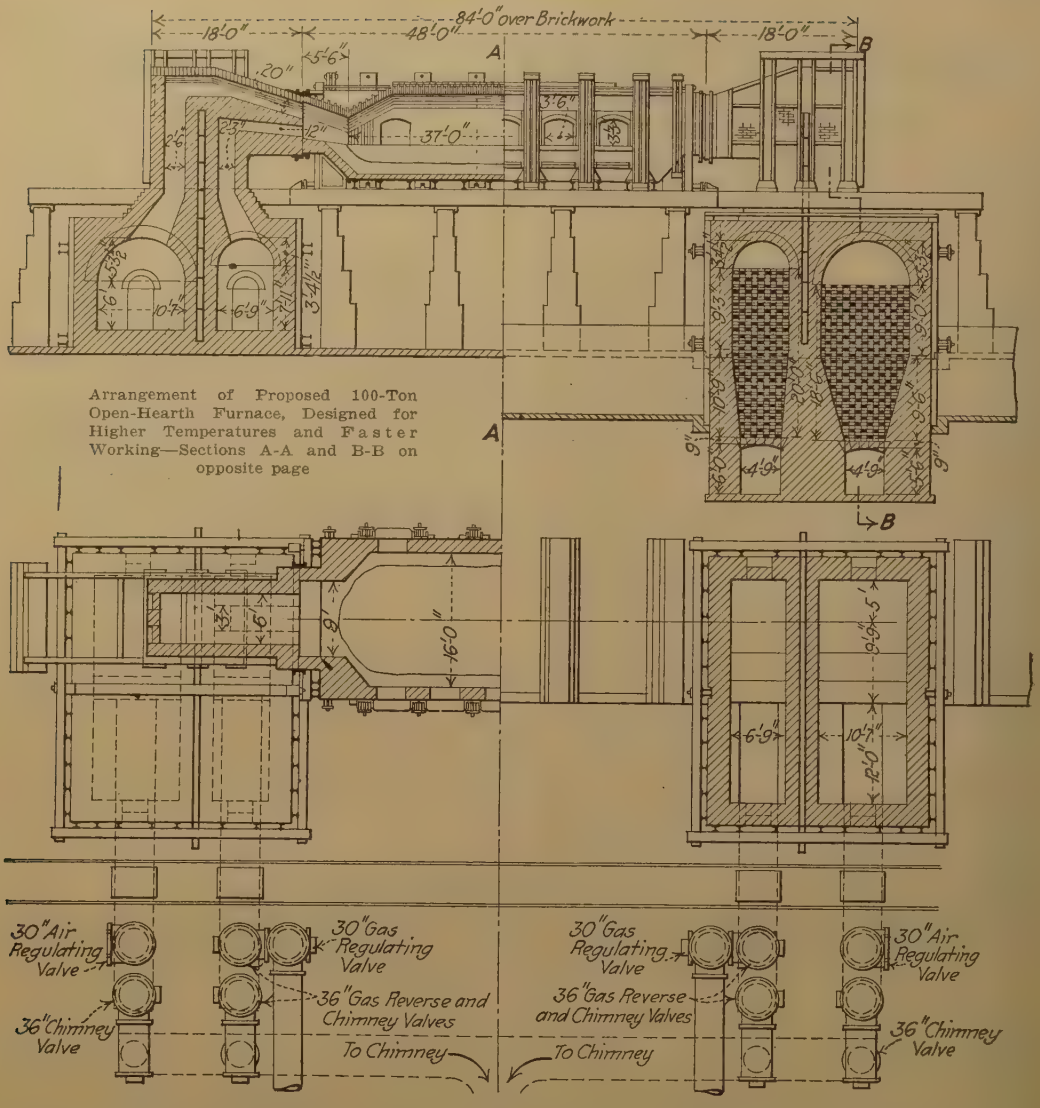
3 The effective heating surface presented by the checkerwork must be ample to allow for a rapid heat exchange, and the arrangement of the checkers must be such that all the particles of the gases are brought into intimate contact with the hot surfaces. As the velocity of the gases is a factor in heat exchange it is important that this should be sufficiently high to give maximum results. A higher velocity also helps to keep the checkerwork free from dust deposit.

Details of Proposed 100-Ton Furnace

The accompanying illustrations reproduced from Mr. Clements' paper show the design of his proposed furnace of 100 tons capacity. In his paper he comments on the various features of construction as follows:

Bath and Ports.—The area of the bath has been determined in accordance with the best general practice, and naturally the relation of length to width has been decided so that the bath is not too wide for easy fettling nor the distance between the arch springers too great for stability, even after making the extra allowance on the distance between the side walls in order to reduce the intensity of the radiant heat effect. The need for this increase in width, along with the greater height of roof, has been demonstrated previously. The distance between what may be called the effective port mouths is 37 ft., and this is deemed from other experience sufficient to insure that combustion is complete before the products of cumbustion enter the outgoing port mouth. Five charging doors are provided, so that the charge can be distributed over the whole of the furnace bath.

With regard to the ports, the usual positions of gas and air uptakes have been reversed, with the considerable advantage that only one uptake need be provided for each. The overall width of the port block therefore is much reduced, and with the design of casing shown, along with the use of cast iron chills at the point of juncture between port block and furnace, it is possible quickly to remove the port end complete and replace it by a spare. Another advantage arising out of this arrangement is that it allows freedom for that relative movement between the port block and furnace, due to expansion, which always takes place. One sheet accompanying the paper shows the velocity of the air leaving the port as 120 ft. per sec. and the gas as 140 ft. per sec. These velocities are higher than is customary, but in order to provide for the increased temperature in the hearth it is necessary for the gas and air to mix rapidly and intimately on the surface of the metal so as to develop the highest temperature of combustion in direct contact with the materials in the bath.



Arrangement of Proposed 100-Ton Open-Hearth Furnace, Designed for Higher Temperatures and Faster Working—Sections A-A and B-B on opposite page

In order to assist in attaining this result the gas and air ports discharge into a common port before entering the furnace. This port with its sloping crown directs the gas and air down on to the metal in the bath, and in conjunction with the port at the other end of the furnace, assists in keeping the flow of gases on the bath surface and prevents any tendency of the stream to rise to the roof. At the same time any danger of burning the arch of the common port is removed by arranging the dimensions so that the gas stream issuing from the gas port is always insulated from the brickwork by the stream of air which is around it.

Regenerators.—It cannot be too strongly emphasized that for the most effective results care must be taken to determine the best proportions of the checkerwork, as in a correctly operated furnace the quantity of heat carried into the regenerators by the products of combustion between the temperatures permissible is only a little in excess of the amount required for adequate regeneration. In the design of the checkerwork attention is called to the following axioms:

(a) Correct weight of effective brickwork.

(b) Maximum heating surface possible per unit volume.

(c) Proper distribution of the gases over the checkers.

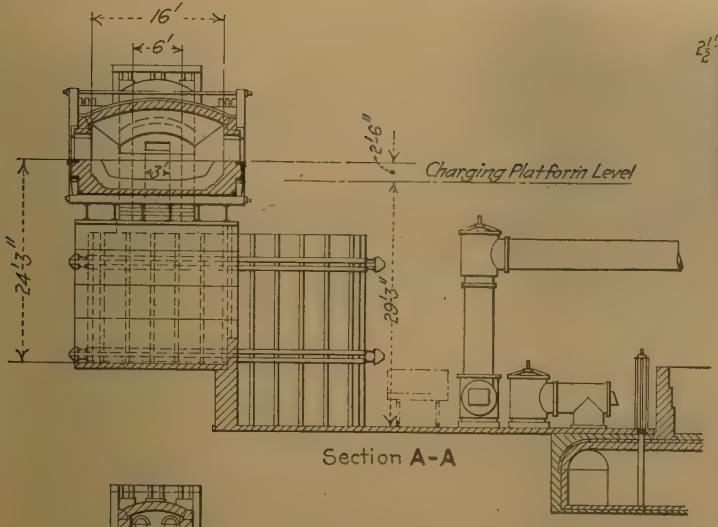
(d) Best velocity through the checkers to give most effective heat interchange.

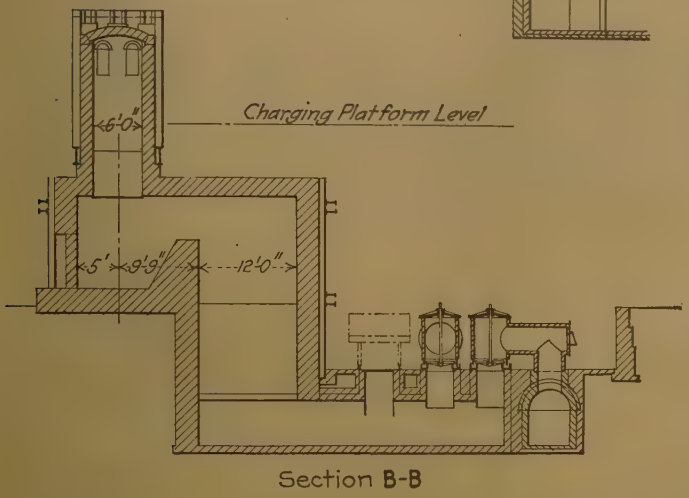
If these axioms be properly followed then the temperature of regeneration will be attained without difficulty. The height of the checkerwork is also naturally determined by the provisions necessary to satisfy the four factors mentioned.

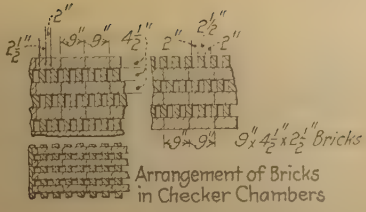
The following comments on axioms (a) and (d) are important:

On Axiom (a).—The weight of effective brick work must be correct for the conditions existing, because with too little mass the temperature range is too great. Again, too much checkerwork is equally undesirable, as in this case the available heat is distributed over a weight of brick work which may absorb the whole, while the mass is so great as to prevent the requisite temperature being attained, the latter being vital to success.

On Axiom (d).—The problem of the ideal velocity through the checkers is one of extreme difficulty. Investigation on this important subject would have a considerable bearing on regenerative furnace practice. As far as is shown by the data available [showing practice at various British steel plants] it would appear that a velocity of about 20 ft. per sec. ought to be allowed. It is essential that the lower sections of the checkerwork should do the major portion of the regeneration, and this being so it is necessary that the heat interchange in these regions should be as effective as possible. The free area arranged therefore should be such as to give a velocity of approximately 20 ft. per sec. through the lower half of the regenerators, after allowing for the increase in volume of the gas due to increase in temperature. However, in order to give a chamber which is economical in construction, the veloc-







ity allowed in the upper half of the checkerwork can be increased, since the density of the gas per unit volume is reduced and consequently higher velocities can be allowed. The reason for the reduction in the cross sectional area toward the bottom of the regenerator chamber will therefore be self-evident.

Binding of Furnace and Regenerators.—The furnace hearth is very effectively bound without the need of the bottom longitudinal tie bolts by using the supporting girders for binding purposes. The gas and air regenerator chambers at each end of the furnace are, in the main, separate units, and this effectively prevents any leakage of gas to the air chamber, which is sometimes a source of trouble. The binding of the chambers is of simple but very substantial character.

Gas Reverse Valves.—In order to reduce the loss of gas on reversal it is advisable that the reverse valves should be as close to the regenerator chamber as possible. On the same basis the type of gas valve used should be such as to shut off the supply to the furnace while reversal is taking place. Any design of gas reverse valve which allows the producer gas to pass directly to the chimney even for the space of a few seconds during the act of reversal is not permissible in an installation where the highest economy is looked for.

Air Reverse Valves.—The air valves provided are of the water-sealed type. Considerable leakage of cold air direct into the chimney gases takes place with the ordinary type of butterfly valve, or dry mushroom valve, unless special precautions are taken to prevent it. Such a leakage is undesirable in any case, but is especially detrimental if the use of waste heat boilers is adopted.

Method of Reversing.—The need of uniform periods between reversals is of paramount importance and while it is customary to leave this operation to the furnacemen, with no doubt usually good results, yet a very strong case can be made out for automatic reversal every half hour. The design of the necessary gear presents no great difficulty, and indeed a similar device is already in service on some types of coke oven plant.

Chimney.—In order to give the suction necessary for the quick removal of the burnt gases from the furnace bath as well as to maintain the speed of the products of combustion through the checkerwork during recuperation the chimney must be ample in height. Under the conditions of temperature anticipated a stack 200 ft. high is calculated to give a suction of 1.75 in. w.g. at the base.

Fuel Consumption.—The fuel consumption used in the calculations, viz., 3 cwt. per ton of steel, allows for using coal at the same rate per hour per ton of metal as is now obtained in the best Park Gate practice, and only takes into account the quicker working which is anticipated from a furnace of the design shown. No allowance has been made therefore for the economy which would result from the prevention of radiant heat losses as suggested, and if this is adequately carried out a fuel consumption of not more than 2 cwt. of good coal at the producers per ton of ingots made could be confidently expected.

Discussion

The proposal to have a separate session of the institute for the discussion of Mr. Clements' paper has been under consideration. From our London correspondent we have the following report of the comment offered at the May meeting:

E. H. SANITER, referring to the graphs of the consumption of gas and air, said no such graphs had ever been published before. Extraordinary changes were shown in the relative consumptions. During charging the gas and air consumptions were high, while during melting the air was high and the gas low. This was not in accordance with preconceived ideas, which might be wrong. It should be remembered, however, that the records related to an individual experiment. In the thermal balance sheet the author assumed that the carbon was burned into CO, but it would be more accurate to take CO_2 as the product of combustion. He thought the particularly deep regenerators advocated would reduce the draft on the furnace or shorten its life. A water-cooled block, on the American system, would be an improvement.

E. B. CHRISTMAS, who made a tour of steel plants in the United States this year, criticized the general lack of water cooling in British furnaces. Quite 95 per cent of American furnaces had water cooling in some form or other. At Gary, Ind., he had seen 45 open-hearth furnaces with Knox water-cooled blocks and door frames. The blocks averaged over 2000 heats at the Edgar Thomson Works, while the total cost of water cooling was 2½c. per ton of steel, the average life of a small door being 40 months and of a large

door 26 months. Waste-heat boilers were common practice and averaged 350 hp. from four furnaces of 75 tons nominal capacity. The present tendency in the United States was to eliminate valves with turns, while the Orth roof was also growing in favor.

DR. A. MCCANCE said the author had calculated his heat balance on a wrong basis, and it contained a cumulative error. The best way was to calculate all the heat put into the furnace and all the heat taken out. He thought the author had made a wrong assumption in working out the radiation losses. Calculating the efficiency on his own methods, Dr. McCance obtained a figure of 32.3 per cent, which he thought was nearer reality than the author's figure of 16.9 per cent.

F. W. HARBORD appreciated the attitude of the author is first ascertaining the theoretical conditions and then seeing how far they could be approached in practice. Investigation would probably show that some of the losses could be considerably modified. As regards radiation losses the only hope in the bath itself was better refractories. The losses in the flue gases were also serious, and he suggested the possibility of cheapening the production of oxygen, which could be used to decrease the present large proportion of inert nitrogen passing through the furnace system and carrying away large quantities of heat.

BENJAMIN TALBOT was somewhat skeptical of the author's idea that the fuel consumption could be brought down to 3 cwt. per ton or lower, although such a reduction would be welcomed by steel makers. He thought the author's 100-ton furnace design was very good, but was afraid that the extra deep regenerators would reduce the speed of the furnace.

J. A. SMEETON said the Siemens furnace was a back number, and advocated a multi-flame continuous-recuperative furnace of the Chautraine type in which he was interested. This, he claimed, should be able to melt steel with 3 or even 2 cwt. of coal per ton. The whole Siemens system ought to be scrapped and something modern substituted. He mentioned economies of 40 per cent on any existing furnace and 85 per cent on many. Members were not unduly disconcerted and apparently preferred to await the results of a practical demonstration, which the speaker hoped to arrange in about six months.

H. M. RIDGE said that he had obtained economies by comparatively simple alterations of Siemens plant, without any change in metallurgical practice, and he thought by applying his method to the Park Gate plant the fuel consumption could be reduced by fully 26 per cent. He noted that in the author's records the CO_2 dropped during melting, which appeared undesirable and a source of heat loss. He also criticized the checker design.

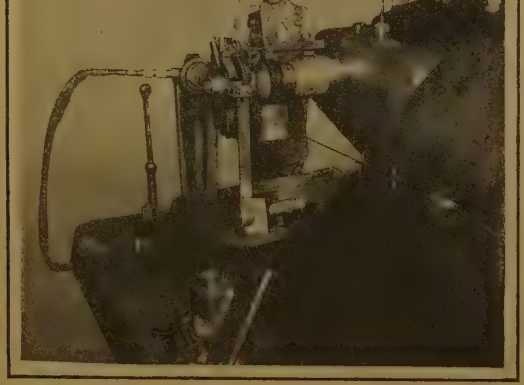
DR. W. H. HATFIELD considered the author's figures for efficiency more accurate than those of Dr. McCance. He thought it quite likely that a fuel consumption of 3 cwt. would be obtained in the author's new furnace, which would be a remarkable achievement.

DR. W. ROSENHAIN pointed out that damage to the refractories was purely a question of the temperature they attained, which depended on the balance between the heat radiated away and the heat supplied. He argued that if the heat supplied were reduced proportionately to the proposed reduction in radiation losses, the refractories would be all right.

Resourceful Engine Repair Job

BY CHARLES L. SMITH

The connecting rod on the ammonia compressor side of a large steam unit in the plant of the Consumers Ice & Cold Storage Co., El Paso, Tex., was recently broken off close to the crank pin end. The crank pin was considerably marred before the engine could be stopped and the damage necessitated either removal and replacement of the wrist pin, or turning off the flange and re-turning the bearing part of the pin.



Repairing the Ammonia Compressor Side of a Large Steam Unit. The flange was turned off and the crank pin re-turned by the apparatus shown

Dismantling the rear end of the unit and sending it to a shop in St. Louis for repairs was decided upon, but before this was done, W. B. Langston, machinist, contracted to repair the machine as it stood. The improvised equipment devised for the job is shown in the accompanying illustration.

The crank pin was originally 7 in. in diameter by 8½ in. from crank to outside of flange on the pin; the bearing being about 7⅝ in. long. To turn off the flange and re-turn the pin the unique apparatus shown, which was made from the head of a 6-in. pipe machine, was used. This mechanism was centered and fastened by bolting into the oil hole in the center of the crank pin, through a cylindrical filler piece, supports being provided to anchor the overhanging outer end.

Attached to the sleeve part of the head there was an extension angle piece with a slot running lengthwise of the crank pin, an improvised tool holder being set in this slot at any point on the length of the crank pin desired. The sleeve of the threading head revolved on the inner piece and was set to true rotation by means of the adjustable jaws, while the bevel gears which rotated the sleeve part of the head were driven through an improvised joint by a Little Giant air motor. To offset the weight of the device arranged to carry the tool a heavy counterbalance was swung opposite.

The flange of the crank pin was turned off and the crank pin itself turned up, on the latter it being necessary to remove ⅛ in. of metal. The finish could hardly be excelled on the best equipped lathe, and while the process was much slower the job was completed in less than a week. This represented an estimated saving in time alone of more than six weeks over the first plan.

The feed of this turning device was regulated by hand by adjusting a Star valve wheel that advanced the sleeve as desired and was arranged for tripping on a trigger fastened on, and brought up from the bed plate of the engine. A collar-shaped ring was made to fit on the end of the crank pin, thus forming a flange. The shoulder was turned on the end of the crank pin, over which this ring was placed with a driving fit, and then countersunk bolted to hold it firmly in place.

The Volta Mfg. Co., Welland, Ont., announces the securing of an order from the Hopetown Steel Works, Bathgate, Scotland, for a standard 3-ton capacity Heroult type electric steel furnace, with transformer and switchboard equipment complete.

APPEAL FOR STATE AID

Canadian Government Asked to Help in Developing Ore Resources

TORONTO, July 10.—Representatives of the miners, engineers, steel manufacturers and transportation officials interested in the development of the iron ore industry of Ontario, in conference at the Parliament Buildings, Toronto, Ont., unanimously adopted a resolution calling on the Dominion and Provincial Governments to launch a scheme of State aid to iron mine operators over a period of 15 years. Although payment of a bounty of 75c. per ton on ore and the giving of assistance in the erection of the necessary plants were suggested as alternatives, the conference finally asked for aid without specifying any sum or method. The members of the conference also put themselves on record as being of the belief that the iron ore resources of Ontario are sufficient to support an important iron and steel industry, and requested the Ontario Government to appoint a committee consisting of at least one metallurgist, one geologist and one transportation expert, to prepare a report on the various phases of the development of the industry. Hon. Harry Mills, Minister of Mines, who presided, intimated that the Government would accede to the request. Considerable significance was attached to the gathering in view of the fact that it marked the first general conference between iron ore operators and steel manufacturers in Canada, some 40 of whom were present. Prominent among the steel men was J. D. Jones, general manager Algoma Steel Corporation, Sault Ste. Marie, Ont., who declared that if the low-grade Canadian ores could be offered at a price equivalent to that of the higher grade American ores now in use, his company would be willing to use Canadian ore exclusively. Mr. Jones also stated that he believed that given production on a sufficiently large scale, pig iron from Canadian ores could be manufactured to sell at $1.75 per ton less than the pig from American ores.

At the present time no domestic ore is being utilized in Canada, owing to the fact that all ore bodies hitherto discovered have been of such low grade as to require beneficiation before being marketed to operators of blast furnaces.

Business Activity Increasing

Advance reports from the Department of Commerce show a rapid improvement in business conditions during the month of May. Practically every industry for which figures have been received shows greater activity. Attention is called to the fact that prices, while they have not become stabilized, are nearly stationary at about 50 per cent above the pre-war level. This is somewhat higher than the low point reached some months ago, when they were about 40 per cent above pre-war level.

Among the advances in productive activity, copper took another big jump, with a total of 88,714,000 lb., the largest month since 1920, and four times the production of six months ago. Exports of copper amount to about 70 per cent of production, as compared with more than 90 per cent in April and with more than 130 per cent in May of 1921. Exports and imports of iron and steel showed moderate increases in May, the exports being the largest for fourteen months. Production of petroleum reached 46,473,000 barrels, or slightly less than the high record of March. Consumption exceeded production by more than 3,000,000 barrels. The lumber industry as a whole is operating at practically 100 per cent.

Both automobiles and trucks showed heavy increases in May, the former being 17 per cent and the latter about 11 per cent above April. Building volume stands at 179 as against 150 for April and 90 for May of last year. The activity is thus practically double what it was a year ago. There is a considerable increase in the number and tonnage of vessels clearing from the United States in the foreign trade, as well as those entering United States ports. The bulk of the increase is in American ships, while foreign ships show a smaller percentage of increase.

Immigration for May numbered 36,880, against 29,166 for April and 82,648 for May of last year. Emigration was 23,147 for May against 24,962 for April and 30,029 for May of last year.

Steel Corporation's Unfilled Orders

The unfilled business on the books of the United States Steel Corporation as of June 30 amounted to 5,635,531 tons, or 381,303 tons more than reported on the books May 31, and the largest amount reported since April, 1921. In May the unfilled business increased 157,311 tons, in April 602,769 tons, and in March 353,079 tons, while in February and January decreases were recorded. A year ago the unfilled tonnage amounted to 5,117,868 tons, or 517,663 tons less than on June 30 last. The monthly unfilled tonnage since January, 1919, compares as follows:

	1922	1921	1920	1919
Jan. 31	4,241,678	7,573,164	9,285,441	6,684,268
Feb. 28	4,141,069	6,933,867	9,502,081	6,010,787
Mar. 31	4,494,148	6,284,765	9,892,075	5,430,572
Apr. 30	5,096,917	5,845,224	10,359,747	4,800,685
May 31	5,254,228	5,482,487	10,940,465	4,282,310
June 30	5,635,531	5,117,868	10,978,817	4,892,855
July 31	.....	4,830,324	11,118,468	5,578,661
Aug. 31	.....	4,531,926	10,805,038	6,109,103
Sept. 30	.....	4,560,670	10,374,804	6,284,638
Oct. 31	.....	4,286,829	9,836,852	6,472,668
Nov. 30	.....	4,250,542	9,021,481	7,128,330
Dec. 31	.....	4,268,414	8,148,122	8,285,366

The largest total of unfilled orders was on April 30, 1917, when it was 12,183,083 tons. The lowest was on Dec. 31, 1910, at 2,605,747 tons.

Trenton Steel & Wire Co. Absorbed

The Maryland Steel Rolling Co., Baltimore, has acquired the plant and property of the Trenton Steel & Wire Co., 599 Ingham Avenue, Trenton, N. J., and will consolidate the business with its organization. The local works will be continued in operation and raw material supply, including hot-rolled strip steel, secured in the future from the Baltimore plant, which will be increased in capacity by the installation of additional machinery to provide for an output of 20,000 tons per annum. The Trenton plant, also, will be enlarged at a later date. John Robinson, formerly president of the Keystone Rolling Mill Co., Pittsburgh, will act as manager of the Trenton works, and Stanton Haines, former manager, will be mill superintendent.

Railroads Contract for Repairs

Due to the railroad strike of machinists, New England railroads are farming out their repair work. For instance, the New York, New Haven & Hartford Railroad has closed a contract with the Keith Car & Mfg. Co., Sagamore, Mass., for the repair of 6000 freight cars, while the Boston & Maine Railroad has placed additional car repair orders with the Laconia Car Co., Laconia, N. H. Such orders so far have failed to bring out additional buying of finished material, the railroads applying material on hand to such work.

To help users of its boilers over any problems that may have developed, the Heine Boiler Co., St. Louis, has recently taken steps to systematize the method by which Heine boilers in use are followed up. The plan includes the arranging of itineraries of field men in such a way that they can conveniently visit and report on Heine installations. The purpose is to establish a connection with the boiler user and ascertain what results are being obtained. Whenever possible the representative gives advice, but if unusual questions are involved, they are referred to the engineering department. The field men are supplied with suitable blanks for making out reports.

BRITISH FOREIGN TRADE

May Steel Exports Second Largest of the Year —Imports Still Light

The May official returns of British foreign trade in steel and iron show that the total exports were 300,981 gross tons. This is an increase of 26,559 tons over April. The May exports are next to the largest for the year, March being 311,654 tons, and compare with a monthly average of 267,047 tons for the first quarter. In May, 1921, the exports were only 101,202 tons. In these totals scrap is included. For the first five months of this year the total exports were 1,376,546 tons compared with 812,829 tons for the same period in 1921.

The May imports were 72,427 tons, or practically the same as March and April. The monthly average for the first quarter is 82,536 tons. In May, 1921, the imports were 89,348 tons. These figures also include scrap. The following table shows comparative data:

British Steel Exports and Imports, Gross Tons

	Exports	Imports
April, 1922	274,422	72,074
May, 1922	300,981	72,427
Average per month, first quarter 1922	267,047	82,536
Average per month, 1921	144,885	152,734
Average per month, 1920	274,881	128,685
Average per month, 1919	188,519	50,801
Average per month, 1913	420,757	195,264

The following table covers the principal exports:

Principal British Exports, Gross Tons

	Average per Month		May	
	1913	1921	1921	1922
Pig iron	78,771	8,602	7,673	41,888
Steel rails	41,676	14,698	10,522	13,063
Steel plates	11,162	10,673	5,607	4,905
Galvanized sheets	63,506	17,635	10,679	46,258
Steel bars	20,921	8,927	4,851	15,472
Tin plates	41,208	18,873	12,350	39,455
Black plates	5,679	1,178	979	5,545
Steel sheets	....	....	3,078	15,355
Total exports, first 5 months, 1922				1,376,546
Total exports, first 5 months, 1921				812,829

As in April, exports of steel rails, galvanized sheets, pig iron and tin plate have shown the most marked recovery. To this must now be added steel sheets and bars.

Pig iron imports in May were 4858 tons compared with a monthly average in 1921 of 55,564 tons.

Iron ore imports in May were 410,821 tons, which compared with a monthly average in 1921 of 157,298 tons.

Manganese ore imports in May were 31,518 tons. Last year they were 14,405 tons per month and in 1913 they were over 50,000 tons per month.

Australia an Expanding Market for Machinery

Australia presents an expanding market for machinery, as shown by the latest Australian statistics, says William Althoff, assistant chief, Industrial Machinery Division, Department of Commerce. Imports of industrial machinery, excluding agricultural machinery, amounted to £9,059,871 for the fiscal year ending June 30, 1921, as against £4,302,419 for 1913. It is also gratifying to observe, he says, a large increase in the value and the percentage of machinery imports emanating from the United States as compared with pre-war figures. In 1913 American manufacturers furnished machinery valued at £1,245,516, or 28.9 per cent of the total, as against £3,884,396, or 42.9 per cent in the fiscal year ending June 30, 1921.

The United Kingdom and the United States have between them practically monopolized the Australian machinery market. The only other countries supplying appreciable quantities are Sweden, Canada, Switzerland, France and Belgium.

German goods have been excluded by the provisions of Australian war-time legislation, but beginning next August may again enter the field. Machinery imports from Germany attainted a maximum of £387,100 in 1913. This represented only 9 per cent of the total for the year.

The growth in imports from the United States as compared with pre-war years is particularly striking in view of the advantages enjoyed in the Australian market by the United Kingdom, among which may be mentioned: (a) substantially heavy preferential tariffs (b) favorable exchange rates; (c) close political, commercial and financial affiliations. A great many of the importing machinery dealers have intimate connections with Great Britain, and some are actually branches of British houses. A considerable number of Australian industrial establishments are financed by British capital. As regards the matter of commercial facilities, three of the most important banks in Australia are British and the rest have branches in Great Britain, whereas no American bank has been established there as yet.

Australia is developing steadily and American machinery manufacturers should not overlook the opportunities presented for the future.

Estimated Value of Australian Production, 1910–1919-20

Year	Agricultural	Pastoral	Dairy, Poultry, and Bee Farming	Forestry and Fisheries	Mining	Manufact'rg	Total
	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000
1910	39,752	56,993	17,387	4,789	23,222	45,598	187,741
1911	38,774	50,725	19,107	5,728	23,494	50,767	188,595
1912	45,754	51,615	20,280	6,432	25,645	57,022	206,748
1913	46,162	57,866	20,341	6,338	25,810	61,586	218,103
1914	36,052	60,265	21,562	6,419	22,275	62,922	209,495
1915	73,769	65,607	21,156	5,777	22,428	62,883	251,620
1916	60,207	89,939	26,949	5,505	23,606	64,205	270,411
1917	57,967	93,435	31,326	5,523	25,581	69,797	283,629
1918	58,080	98,297	33,738	7,137	26,156	75,261	298,669
'19-'20	72,234	109,062	38,830	10,170	19,725	98,162	348,183

Condition of the Belgian Machine Tool Market

In spite of improved industrial conditions and the removal of much of the immediate threat of German competition, the market for American machine tools in Belgium is rendered heavy by the presence of considerable stocks of American machinery probably aggregating 15,000,000 francs in value, which will no doubt require another year for liquidation even at the sacrifice prices at which they are being sold off, says Acting Commercial Attache S. H. Cross at Brussels. Appreciation of American equipment, even at higher prices, is indicated, however, by the fact that at the recent Commercial Fair one of the best known Belgian manufacturers sold no lathes whatever, while several purchasers were found by representatives of American manufacturers. Some sales of universal millers as well as of broaching and balancing machines, ordered from the United States rather than taken from local stocks, indicate also that American prices are reaching a point where they are interesting to the native user, though Belgian dealers in machine tools, after taking considerable losses, cannot be expected to stock machinery again for some time.

Two factors must be distinguished in regard to German competition with American tools. At the present time, in view of constantly increasing labor costs in Germany and the discriminatory tariff against German products, the German manufacturer cannot currently produce a machine tool and deliver it in Belgium at a price very much below our own quotations. On the other hand, German machinery dealers who accumulated considerable machinery stocks before production costs in Germany had greatly risen can still undersell American tools as long as these stocks hold out. A case of this sort is noted in which a well-known American radial drill is quoted in Belgium at 13,500 francs, while a German machine directly copied from the American apparatus and practically identical with it could be purchased in Germany a few months ago for 4,000 francs. The chances are that at present the German machine at the factory would cost double this amount. The position of the German manufacturer is exemplified by another instance in which an American representative quoted a Belgian prospect 82,000 francs for a well-known make of American wheel lathe including motor, and was told by his customer that he could get the same machine from the firm of W. Hegenscheid, of Ratibor, for 40,000 francs. The customer for one

reason or another delayed placing the order in Germany, and when he finally did so, learned that the German price had been advanced to 80,000 francs without motor.

Except on light tools, such as small millers, some of which are direct copies of American machines, it can hardly be said that Belgian manufacturers present very serious competition with American tools on any basis except price.

The outlook for machine tool sales in Belgium is thus on the whole more hopeful during the present spring. Better results can probably be obtained in this market by quoting local representatives special prices and by supporting them to the extent of supplying moderate stocks on consignment, as the losses of the average firm have been too great to permit any purchases for stock.

German Iron and Steel Output in 1919

Official data of the German pig iron and steel production in 1919 have been made public in *Stahl und Eisen* of June 15. This is the first publication of details as to grades as well as the final figures for the total outputs. The pig iron output in 1919 was as follows in metric tons:

Foundry iron	1,372,469
Bessemer iron	61,018
Thomas iron	2,693,607
Open-hearth iron, ferromanganese and spiegeleisen	1,521,390
Puddle iron	104,576
Other grades	1,338
Total	5,654,408

Of this total 3264 tons is classed as charcoal iron.

The steel output for 1919 is classified as follows:

Ingots		6,731,699
Basic Bessemer	2,388,421	
Acid Bessemer	44,190	
Basic open-hearth	4,143,700	
Acid open-hearth	61,712	
Electric	55,382	
Crucible	38,294	
	6,731,699	
Castings		145,699
Total		6,877,398

The total production of rolled steel is given as 6,362,543 tons, of which 1,132,257 tons was semi-finished steel.

The coke output for 1919 is reported as 22,709,532 tons and that of briquettes as 19,300,555 tons.

At the close of 1919 there were 232 blast furnaces in existence, of which 152 were operating. The number of open-hearth furnaces was 451 making ingots and 143 making steel castings. Total electric furnaces were 38 on ingots and 13 on steel castings.

New Zealand Blast Furnace Starts

WASHINGTON, July 11.—Organized in 1920, the Onakaka Iron & Steel Co., Onakaka, New Zealand, made the first tapping of its blast furnace on April 27, this year, and, according to a report received by the Department of Commerce from Consul General David F. Wilbur, Wellington, several tons of high quality iron were secured. The company was organized, it is stated, for the purpose of developing the limonite deposits which are found on the ridges bordering Golden Bay located near Nelson on the South Island. It recently purchased the plant of the New Zealand Iron Ore Smelting & Mfg. Co., which had been endeavoring to develop a commercial method of separating the metal from the iron-sand deposits along the west coast of North Island. The latter company was defeated by the presence of titanic acid, and the former was able to secure the plant. It is expected to produce eight to ten tons every eight hours and to confine the output for the present to 100 or 150 tons for the purpose of thoroughly testing the various units connected with the plant. The company expects to supply two-thirds of the demand of the New Zealand market which imports as high as 10,000 tons of pig iron annually.

The Struthers Furnace Co. has its merchant stack at Struthers, Mahoning County, Ohio, ready to go into blast, but it has not yet been able to get the coke. It planned to blow in the stack June 15.

LOCKOUT ENDED

English Engineers Obtain Some Concessions, But Concede Important Principle

A cable from Commercial Attache Tower to the Department of Commerce, Washington, states that great satisfaction is felt in Great Britain over the settlement of the engineering lockout. Unemployment is on the decrease. The gradual and consistent improvement in the United Kingdom foreign trade position has injected a feeling of confidence, and the general tone of business is much better. Increased activity is apparent in the iron and steel, textiles, and engineering trades toward the close of June as compared with May.

The engineering lockout which lasted more than three months has been settled satisfactorily and the men are returning to work under the conditions enacted. The dispute involved the principle of management by employees or their representatives, a point which the British owners considered beyond discussion. This was the fundamental point at issue. In the settlement the men have obtained certain concessions, but the principle that the management be vested in the employer has been maintained. The ballot of the members of the Amalgamated Engineering Union on the modified terms put forward by the employers were 75,478 for acceptance and 39,423 against acceptance—the majority for acceptance being 36,055.

Award of Rolling Stock to Belgian Maker Recommended

WASHINGTON, July 11.—Award of 130 cars, 100 gondolas and 30 box cars, has been recommended to be made to a Belgian maker, Hanis St. Pierre, by the transportation division of the Buenos Aires Port Railways, the bid of this maker being $1,875 Argentine gold for each gondola and $2,542 Argentine gold for each box car. Bids on 10 locomotives were rejected. A revision of the bids, reports Commercial Attache Edward F. Feely, showed that there were seven German manufacturers who quoted prices almost identical, and it was for this reason that all the bids were rejected. New bids have been called for.

Foreign Contracts for Electric Furnaces

The United Aluminum Works, Lautewerke, Germany, has contracted with the Electric Furnace Co., Salem, Ohio, for a 200 kw. tapping type electric furnace capable of holding 4000 lb. of aluminum. Mitsui & Co., New York, has purchased, for shipment to Japan, an automatic set for heat-treating forgings. The hardening furnace will be rated at 80 kw. and will contain five rows along which the forgings will advance. The only manual operation will be the periodic placing of material before the pusher of this furnace.

Two new Baily furnaces are also going into operation at the Port Huron plant of the American Bushings Corporation. The first is a 105-kw. brass melting furnace of 1500 lb. capacity; the second is a 60-kw. annealing furnace for bronze bushings. This furnace has a magazine feed and contains 11 rows for advancing the bushings down to 11 discharge tubes, treating the product at the rate of one bushing every three seconds.

Effects of Strike at Youngstown

YOUNGSTOWN, July 10.—As yet the strike of railway shopmen has not interfered with transportation of raw materials to the mills, or shipments of finished products. Repair of industrial railroad equipment is largely made by the plants themselves, and rolling stock of the mills is therefore not likely to be put out of commission.

Some slight interference with coal movement has been noted, due to inability at certain railroad centers to handle locomotive repairs. In this district, the strike has had little or no effect in impeding rail operations and motive equipment has been sent to the shops in this territory from other districts for repairs.

LOWER WATER RATES

Sharp Competition Between Lines Carrying from Atlantic to Pacific Ports

Following the break-up of the conference of shipping lines carrying from Atlantic Coast to Pacific Coast ports, what is quite evidently a rate war has broken out among the intercoastal lines, and as long as it lasts Pacific Coast consumers of iron and steel will derive considerable benefit from the lowered rates. The first result of the cancellation of agreement on rates between the several steamship companies was a drop from 60c. per 100 lb., the recent minimum on plates, sheets, tin plate, bars and other easily stored steel products, from New York, Philadelphia, Baltimore and Boston to Pacific Coast ports of call, to 40c. per 100 lb., a saving of $2 per ton. At least one company quotes a rate as low as 30c. per 100 lb. on shipments from Boston, New York and Philadelphia, and this rate per 100 lb. has been named on contracts running over the remainder of the year. A rate of 35c. per 100 lb. has been quoted on contracts to run until July 1, 1923. Lines offering a year's contract on this basis also are giving guarantees against a decline in the shape of a promise to meet any legitimately quoted rate of less than 35c.

While some companies claim to be maintaining a rate of 60c. per 100 lb. on easily stored iron and steel items, the same companies have reduced pig iron to 50c. per 100 lb., from the old rate of 55c., and are carrying a charge of 60c. per 100 lb. on wire rope, which formerly carried a rate of $1. The company quoting 30c. per 100 lb. on easily stored items of iron and steel is charging only $5.63 per net ton, or 26.8c. per 100 lb. on pig iron from New York, Boston or Philadelphia to the Pacific Coast.

Including the rail charge from Pittsburgh to the Atlantic seaboard of 34c. to New York, 32½c. to Philadelphia and 31½c. to Baltimore, plus 5c. per 100 lb. for handling, there is a combined rail and water charge from Pittsburgh to the Pacific Coast of 66½c. to 69c., which compares with the all-rail rate, which became effective July 1, of $1.50 on all steel products except ship plates, the new rate on which is $1.20.

Lower Pig Iron Rates from Birmingham

BIRMINGHAM, ALA., July 11.—The Louisville & Nashville and Southern Railroads have notified Birmingham iron makers of rates on pig iron over their lines from Birmingham to St. Louis and Ohio River crossings considerably lower than the reduced rates of the Interstate Commerce Commission going in effect July 1. The rates announced by these two railroads to points named are as follows:

To St. Louis, $4.22, or 95c. less than the recently announced rate.

To Cincinnati, $3.53, a reduction of 52c.

To Louisville, $3.24, a reduction of 48c.

The notice says these rates will be in effect as soon as possible. The reduction in these rates is from 21 to over 26 per cent under the rates prior to July 1.

Reduced Cost of Iron Making

A steel works interest at Youngstown figures that its assembly charges on raw materials sufficient to produce one ton of pig iron have been reduced by recent freight cuts from $9.59 to $8.55.

For the Mahoning Valley, lower freight rates will mean a yearly saving of about $5,000,000, it is roughly estimated. The 1920 freight bill of one of the largest interests was close to $10,000,000. Had the advance which became effective in August of that year applied throughout the 12-month period, it is estimated the gross charge would have been close to $12,000,000. On normal business, therefore, an average of 10 per cent reduction would mean a saving to this interest of about $1,200,000. The 1920 freight bill of another Valley independent approximated $4,000,000, and this company estimates the freight rate cut will mean a saving of at least $500,000 per year.

Lake Ore Shipments in June

The movement of Lake Superior iron ore by water in June and for the season up to July 1 was considerably larger than that of the corresponding period in 1921. June shipments from upper lake docks amounted to 6,629,711 gross tons against 3,600,989 tons in June, 1921, an increase of 3,028,722 tons or 84.11 per cent. The total to July was 8,351,177 tons or 1,979,950 tons in excess of the movement to July 1, 1921.

The shipments by ports for June, 1921 and 1922, and for the season were as follows:

	June, 1921	June, 1922	To July 1, 1921	To July 1, 1922
Escanaba	138,756	586,656	210,804	804,594
Marquette	88,959	324,419	52,944	394,544
Ashland	309,398	902,759	526,937	1,199,448
Superior	873,674	1,632,911	1,716,230	2,354,595
Duluth	1,681,411	2,017,801	2,908,299	2,253,863
Two Harbors	558,791	1,165,165	956,013	1,344,133
Total	3,600,989	6,629,711	6,371,227	8,351,177
Increase		3,028,722		1,979,950

Duluth shipments this year have been considerably less than in 1921 or only 26.99 per cent of the total to July 1. Ashland and Escanaba have contributed to the largest increase.

Acquires Control of Smith & Davis Mfg. Co.

ST. LOUIS, July 10.—William E. Hoblitzelle, former general manager of the Commonwealth Steel Co., St. Louis, who has been vice-president of the Duquesne Steel Co., Pittsburgh, for the last four years, has bought the control of the Smith & Davis Mfg. Co.—1231 of the 2000 shares, appraised at $439,467—St. Louis, from the wife and children of the late Clarence J. Curby, who accidentally shot and killed himself in his home here last February. Mr. Hoblitzelle was in charge of the Granite City plant of the Commonwealth Steel Co. for 12 years preceding 1918.

The Smith & Davis company, which manufactures metal beds, was established in 1876. The present company, employing 700, occupies a building at the northeast corner of Twentieth and Locust streets. There will be an expansion soon which will make necessary new or additional facilities, according to Mr. Hoblitzelle. Officers who will remain with the company are: James C. Harvey, vice-president; J. H. Kentnor, secretary; W. H. Whitehill, treasurer, and Henry Knickmeyer, superintendent.

Sheet Prices Irregular

YOUNGSTOWN, July 11.—Sheet prices are characterized as somewhat erratic by a number of district independents. An interest whose books are well filled with galvanized grades has been accepting black tonnages at the 3.15c. level of the leading interest, to round out rolling schedules. One of the principal Valley independents states it has been booking blue annealed sheets at 2.60c. base gage. All interests have sizable backlogs, sufficient to maintain production at a rate approximating normal for five to six weeks. Rolling mills idle last week for repairs have resumed and capacity is occupied at a rate in excess of 90 per cent.

Though some sheet bar tonnages have been booked in this territory at $37.50, the maker who entered the business states that prices are tightening at $35, which is expected to be the governing price for the quarter.

The Riter-Conley Co., Pittsburgh, has made its first shipment of fabricated steel on an order taken several weeks ago for 30 80,000-barrel oil storage tanks for erection at Pearl Harbor, Hawaii. About 2500 tons of steel is in the shipment.

The Central Iron & Steel Co., Harrisburg, Pa., is now operating at 70 per cent capacity, and is expected soon to resume full operations. A number of additional workmen have been employed recently.

Orange Peel Bucket for Foundry Use

An air-operated orange peel bucket, constructed, as shown in the illustration, is being offered by the Hayward Co., 50 Church Street, New York. It was designed primarily for use in car-wheel foundries in cleaning out the car-wheel pits, but is intended also for use on any foundry crane or hoist adjacent to air lines, and in any materials. Hot sand can be removed from car-wheel pits several hours before it can be handled by the usual method. Its usefulness may be further extended to cleaning up refuse, mixing sands, digging pits and other jobs around the foundry. In many cases the bucket can be operated by the crane man.

In cleaning car wheel pits it has been necessary to wait until the pits were sufficiently cooled to permit a man to enter them. One man, located at the bottom of the pit, shovelled the material into a pail, which was hoisted by a man above. This entailed considerable

Air-Operated Orange Peel Bucket for Removing Hot Sand from Car-Wheel Pits and for Other Foundry Uses

loss of time, and the work was usually done on Sundays or holidays, the pits being out of commission during the period of cooling, and also during the process of removing the material. The new air bucket is intended to eliminate waiting for the pits to cool and to save time in cleaning the pits, the time of which operation having been reduced 75 per cent over the old method, it is claimed.

The same hoist as used in the regular foundry work may be employed to lower and hoist the bucket and material, the bucket being operated from any adjacent air line. A four-way valve is used with a Cleveland Pneumatic Tool Co.'s air connection to the top of the bucket, permitting the armored air hose to be readily detached from the bucket head to facilitate moving from place to place.

The bucket shown is of 2 cu. ft. capacity and weighs approximately 300 lb. The closed diameter is 25 in. and the height closed 41 in. The open diameter is 30 in., the height when open being 45 in. Other sizes from ¾ to 9 cu. ft. capacity are made to suit various conditions and for handling all classes of material encountered in foundry work.

The Hunting, Davis Co., Century Building, Pittsburgh, has the plans for a new packing and distributing plant for the Chesborough Mfg. Co., a Standard Oil Co. interest, to be erected near McKees Rocks, Pa., on the Pittsburgh & Lake Erie Railroad. The buildings comprise a packing house of reinforced concrete construction, a boiler house and a tank storage house.

Lathe Attachment for Long Lead Threads

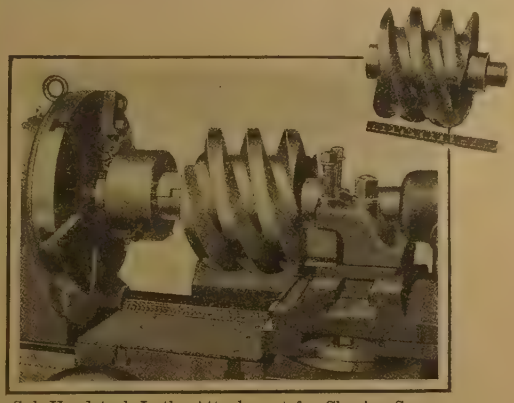
The Hendey Machine Co., Torrington, Conn., has placed on the market the attachment illustrated, called a sub-headstock, the primary purpose of which, applied to Hendey lathes, is the chasing of screw threads having unusually long leads.

The mechanism consists of a reduction gearing driven from the nose of the spindle, with driving face plate, and a dead center. The gearing gives a reduction of 6 to 1, the work revolving one turn to six turns of the spindle. The feed gearing and lead screw are driven from the spindle in the usual way.

If the gear box handles are set for the coarsest lead shown on the index, 1 in., it is obvious that for six turns of the spindle the carriage will have advanced 6 in. and the work revolved one turn. This, it is said, will not to any great extent increase the pressure on the screw cutting gearing over that obtained with the lathe regularly equipped in chasing 1-in. lead.

The sub-headstock is readily attached or removed. The frame is mounted on the ways of the bed and is backed against the front housing of headstock to take end thrust. It is fitted to the bed in the same manner as tailstock base and is clamped by two bolts. The face plate has six tee-slots to permit of work being bolted to plate and it also has a special driver. The standard open-side tool rest is provided with the attachment if not already supplied with the lathe, and although recommended for the work involved, the special compound rest with two-strap tool rest or the compound four-way tool block can also be used.

It is to be noted that all work centered is carried on two dead centers, the same as in a cylindrical grinder, the work being revolved by a suitable dog engaging with the face plate driver. With the regular feed gear-



Sub-Headstock Lathe Attachment for Chasing Screw Threads Having Long Leads

ing on the standard lathe, the longest lead obtained is 6 in. for 18, 20 and 24-in. lathes, and 4 in. for 12, 14 and 16-in. lathes. By using special change gears a lead as long as 10 or 12 in. can readily be obtained.

Other applications of the sub-headstock include forming shapes, cutters, etc., with very wide tools where exceptionally low speeds are required, and the turning of such work as would call for the use of the dead centers where extreme accuracy is wanted.

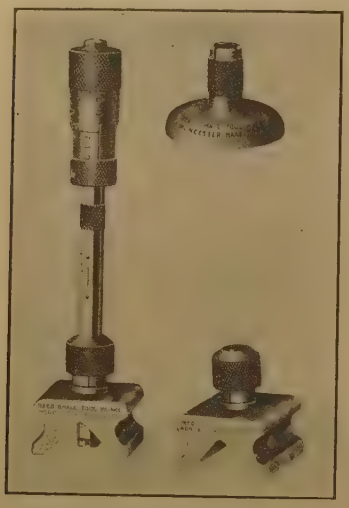
Orders booked by the Allis-Chalmers Mfg. Co., Milwaukee, in June, exceeded the total bookings in May by $2,370,000, according to a report made by Otto H. Falk, president, to the board of directors at the monthly meeting held at the general offices in West Allis, Milwaukee, July 7. George M. Moffett, New York, president Corn Products Refining Co., was elected a director to fill the vacancy caused by the death of William T. Abbott, Evanston, Ill. A quarterly dividend of 1 per cent on common stock of record July 15, payable Aug. 15, was declared.

The American Gear Manufacturers Association will hold its semi-annual meeting in Chicago, Oct. 9 to 11.

Inside Micrometer and Height Gages

A new size of inside micrometer gage with a measuring range from 2 to 32 in., which is lower in range than its previous design, has been brought out by the Reed Small Tool Works, Worcester. Two height gage attachments as shown in the illustrations, for use with the micrometer, are also being offered.

The new tool is graduated to read to thousandths of an inch and has the usual half-inch run of spindle. It incorporates the sturdy design of the previous style and retains the regulation diameter of barrel, spindle and thimble, as well as the large surfaces to permit of figures of generous size. The rods are fitted with hardened tool-steel anvils, adjustable for wear, and are interchangeable on the threaded stud at the end of the micrometer head, and can be used in combination. A detachable handle is provided and arranged so that the tool can be used for right- or left-handed work. The standard set is provided with a case and is made up of the micrometer head, an adjusting wrench, five rods



The Height Gage in Combination with the Micrometer Is at the Left

and a ½-in. spacer, the capacity provided being from 2 to 7 in. With five additional 5-in. spacers the maximum range of 32 in. is secured. The micrometer is transformed into a height gage by the attachments shown.

The height gage and alinement attachment known as the No. 6 is shown in combination with the inside micrometer, a reliable height gage being simply obtained, it is claimed, to serve where a more expensive tool would otherwise be required. By attaching a rod of proper length to the micrometer, any range from 3 to 32 in. is available. The rod is inserted downward through the case-hardened base until the anvil finds the surface from which the measurement is to be taken. A quick clamping knurled nut is provided and holds the measuring rod in the perpendicular position.

This tool is intended to be useful in obtaining the height of projections from plane surfaces, the location of bushings in jigs, etc., being particularly convenient on planer work which frequently requires taking measurements from the bottom of a groove to points above, and for setting planer tools or the milling machine table. The V-shaped groove at the bottom of the base is provided to adapt the tool for use in cylindrical work, measuring distances between shafts or for alinement purposes. By inserting a 0.250 in. drill rod in the base and attaching any standard indicator, a surface gage for use in straightening shafts or for checking the variance in the distance between surfaces can be obtained. A surface gage scriber can be conveniently clamped to the rod, forming still another tool.

Another attachment known as the No. 7, shown also in the illustration, and having a round base, is intended mainly for height-gage purposes. It has a large base and the hole for the measuring rod is said to be greater in size and depth than usual. The upper end of the support, vertically split at right angles, is adjusted to permit a sliding friction as the rod is inserted, and will tend to prevent side play in the event of wear. It is also intended to hold the base and micrometer measuring rod intact when the tool is lifted from one surface to another, the knurled exterior also facilitating handling.

Shipping Board Selling Surplus Material on Pacific Coast

All surplus marine stock of the United States Shipping Board stored at points along the Pacific Coast is to be disposed of immediately at open competitive bidding. In addition to the contents of St. John's Warehouse at Portland, Ore., the Shipping Board has directed the sale, at public auction, of its property at Tacoma, Wash., and at Alameda, Cal. The sale at Portland took place on Tuesday, July 11, the sale at Tacoma takes place on Tuesday, July 25, and the sale at Alameda on Tuesday, Aug. 8.

Included in the sale of material at Tacoma are a large number of standard water tube boilers, locomotive cranes, scales, warehouse trucks, timber dollies, tractors, plumbing fixtures, tanks, pumps, blower sets consisting of fan and high-speed reciprocating steam engines, feed water-heaters and gages, galley equipment, office furniture and supplies, paint, oil, varnish, dry colors, wire rope, lumber, building material, electrical equipment, hand saws, bolt heading machines, large quantities of tools, etc.

The materials to be sold at Alameda consist of cranes, derricks, switching locomotive, standard water tube boilers, a considerable quantity of plumbing fixtures, valves and pipe fittings, machine tools, metal and wood-working machinery, augurs, drills, hammers, shovels, reciprocating high-speed engine driven blower sets, pumps, tanks, furniture, textiles, galley equipment, wire manila rope, hardware, wood preservatives, railroad ties, electrical material, mechanical telegraphs, telephone poles, searchlights, cargo lights, nautical instruments, clam shell buckets, etc.

Further Standardization of Farm Implements

Farm implement manufacturers have held preliminary conferences with Secretary Hoover of the Department of Commerce to discuss the further standardization of agricultural machinery. Following the formulation of a new list of implements and the elimination of those not considered necessary by the General Standardization Committee of the National Association of Farm Equipment Manufacturers, further conferences will be held in the fall between representatives of the farm equipment makers and Secretary Hoover, when the new schedule will be announced. The new standardization program will go so far as to reduce the number of sizes of bolts, screws and other standard parts, so far as can be done without preventing individuality of manufacture and interfering with practical plant operation. The enthusiasm for standardization is the natural outcome of the recent dull period when manufacturers found that their inventories of both raw materials and finished products were considerably smaller than they would have been if the standardization program, which dates back to the war years, had not been adopted.

The Maynard Electric Steel Casting Co., Milwaukee, Wis., is building an addition to its foundry 100 ft. by 120 ft., which will increase the molding and core making floor about 50 per cent. Business has been brisk with the company.

The National Enameling & Stamping Co. will increase its sheet steel capacity by 25 per cent through an addition of six new mills at Granite City, Ill., at a cost of $1,500,000.

"Pittsburgh Plus" and the Proposed Mergers

Western Rolled Steel Consumers Ask Attorney General to Consider Basing Point Case in Connection with Investigation of Proposed Independent Consolidations

CHICAGO, July 10.—Following the statement circulated by the Associated Press that Attorney General Daugherty invited the opinions of members of the iron and steel trade on the mergers of independent steel mills, it was learned in steel circles here that the Western Association of Rolled Steel Consumers had addressed a letter to the Department of Justice discussing the consolidation in relation to "Pittsburgh Plus." The communication which was obtained by application to the Association, reads as follows:

HON. H. M. DAUGHERTY,
Attorney General, United States,
Washington.

Dear Sir:

Referring to the proposed steel mergers and your request for statements from responsible persons in connection therewith, we desire to call to your attention the practice in the steel industry known as "Pittsburgh Plus."

The Federal Trade Commission is now conducting an investigation as to this practice, under a complaint issued upon our application. This investigation has been handled in a very thoroughgoing, competent and exhaustive manner, and we are confident that the commission will arrive at a just conclusion upon the evidence when its hearing has concluded.

It is quite probable, however, that if the proposed mergers of the several steel companies are effected, there may be an intimate connection between them and this practice. The proposed mergers may or may not be for the best interests of the industry and for the best interests of the public. As to that we express no opinion, nor have we one to offer. However, since your department has undertaken to investigate and supervise the mergers in question, we believe it of the utmost importance, in the interests of western industry, that such investigation include the practice of "Pittsburgh Plus."

Mergers of steel companies which might otherwise be for the benefit of the industry and the public might have an effect upon the extension and perpetuation of this unjust practice which would be very injurious, and which would seriously handicap the Trade Commission in its present investigation, or possibly render its orders ineffectual.

For the reasons above indicated we desire to call this practice to your attention and to request that it be included in your investigation in order that the interests of this association, which represents 800 of the major Western manufacturers, and the interests of the public generally may be fully protected, not only with respect to the mergers themselves, but also with respect to the practice of "Pittsburgh Plus" which must of necessity be intimately connected therewith.

For your information we are inclosing some data and some expressions of opinion with respect to the practice. We believe you can fully inform yourself with regard to the same through the Federal Trade Commission.

Trusting that this matter may have your attention, we are

Very truly yours,

WESTERN ASSOCIATION OF ROLLED STEEL CONSUMERS,
W. E. McCollum, Secretary.

Possible Results of Merging

While the Association does not go on record for or against the mergers, it does intimate that their consummation might result in the perpetuation of the Pittsburgh basing point for finished steel prices and calls upon the Attorney General to give due consideration to this possibility in passing upon the question before him. The views of the association are amplified in a public statement sent out to the press. This asserts, in part:

"Some manufacturers using rolled steel believe the effect of the mergers will be good, because by merging mills east and west of Pittsburgh in one large company they will eliminate wasteful cross-hauls and thus effect economies which may be reflected in lower cost of steel to the consumer. Others assert that there is danger in the new combination, as there is likelihood that the two new companies may again merge, taking in others, into a giant corporation which would control approximately 30 per cent of the steel output of the country and this, added to the 45 per cent now controlled by the United States Steel Corporation, would give two powerful corporations control of 75 per cent of the entire steel output, and consequently an unshakable grip upon the nation's steel industry, which would enable them to set any price for steel they saw fit.

"Manufacturers and fabricators of rolled steel do not generally object to but rather favor a stabilized market. They do, however, object to the iniquitous 'Pittsburgh Plus' practice or to any other practice which penalizes efficient mills in favor of inefficient mills or that will cause differentiation in price between manufacturers in different sections of the country, discriminating against the entire country in favor of the relatively small section close to Pittsburgh."

Production Costs

In further comments on the investigation undertaken by the Attorney General, the statement calls attention to testimony brought out in the prior inquiry by the Lockwood Committee, and particularly to certain considerations as to production costs which that committee failed to develop. It says:

"John A. Topping, chairman Republic Iron & Steel Co., testifying before the Lockwood Committee, indicated the advantage of the United States Steel Corporation over independents at from $3 to $5 a ton. Judge Gary thought $3 per ton would be the maximum. Both these gentlemen denied that the United States Steel Corporation had an advantage over the independents because of its great holdings of ore and coal properties and attributed the advantage to the Corporation's ownership of railroads, advantage of massing production at strategic points for distribution and geographical advantages both in the distribution and assembling of raw material with their resultant economy and efficiency.

"*The Chicago Tribune* compares the actual earnings of the railroads owned by the Corporation in 1920 with the Corporation's output, averaging the advantage at $4 a ton, and asks where the additional $40,000,000 comes from. The *Tribune* forcefully brings out—what the Lockwood Committee did not—that the earnings of the Corporation-owned roads could not account for the entire advantage, since their aggregate earnings, according to *Poor's Manual*, were approximately $13,000,000 in 1920, the last year for which figures are available.

"Well posted men in the steel trade assert that the major portion of this enormous difference results from the Corporation's ownership of steel mills at the lower end of Lake Michigan and also at Birmingham, Ala., admitted points of low-cost production. It is also asserted that the amount collected for the 'Pittsburgh Plus' unearned freight charge helps to swell these profits."

Questionnaires Will Throw Light on "Pittsburgh Plus"

In discussing the separate investigation of the mergers which has been undertaken by the Federal Trade Commission, W. E. McCollum, secretary Western Association of Rolled Steel Consumers, asserted that the questionnaires sent to all large steel producers will be of the utmost value in clearing up points at issue in the "Pittsburgh Plus" controversy. The questionnaires ask the production figures for each class of rolled steel, also the tonnage of each product shipped

to each State during 1921, and, if possible, 1919 and 1920 also.

"With this information," Mr. McCollum added, "the commission expects to ascertain the greatest area of production and consumption and chart the movement of all rolled steel. This is very interesting from our point of view. It will undoubtedly elicit information we have long sought, which, we believe, will show the West and South have potential, if not actual, producing capacity sufficient to supply all steel demands in those sections, and thus knock the last prop from under the supporters of 'Pittsburgh Plus.'"

Steel Corporation Will Present Its Case

WASHINGTON, July 11.—The Federal Trade Commission will complete the presentation of its side in the Pittsburgh-base proceedings either the latter part of this week or the fore part of next, it was stated at the offices of the commission. The final hearings on the side of the commission now are being held at Chattanooga, Tenn.

The next step will be for the United States Steel Corporation to present its side through the witnesses it will call. It will be at liberty to have the hearings held wherever it desires, and this will probably mean that they will be held at least in some of the points where hearings for the commission's side were conducted. After the hearings are entirely completed, arguments will be made before the commission in Washington, to be followed either by a dismissal or cease and desist order by the commission. In the event the latter course is followed, it is assumed that the case will be appealed by the Steel Corporation and carried through the Supreme Court of the United States.

The probable attitude of the commission has taken on increased interest because of the change in its personnel since the complaint was issued at the request of the Western Association of Rolled Steel Consumers. Of present members of the commission who passed on the complaint, two, Chairman Gaskill and Commissioner Murdock, voted against its issuance, while Commissioner Thompson voted for its issuance, being joined in his vote by former Commissioners Colver and Pollard. There have been two new members of the commission since the complaint was issued, Commissioners Nugent and Van Fleet.

In the event the attitude of Chairman Gaskill and Commissioner Murdock remained unchanged and they voted for dismissal of the complaint, and are joined in such a vote by either one of the two new members, the majority would be in favor of dismissal. On the other hand, if both new members should vote for a cease and desist order and the attitude of the old members are unchanged, the majority would be in favor of this order.

Judge Van Fleet has become associated with the commission so recently that he has not had an opportunity to study the case.

Hearing Concluded at Chattanooga

CHATTANOOGA, TENN., July 10.—The Federal Trade Commission's hearing of Southern steel consumers in their complaint against the Pittsburgh base plan of selling steel was concluded Friday and the session was adjourned to Washington to meet at a later date. The record now embraces 11,000 pages without tabulated matter and 4000 exhibits showing contracts for purchase of steel from various manufacturers.

Among the last to testify was William P. Copping of the Copping Steel Plate & Iron Works, New Orleans. He said that he had formed a connection with a Pittsburgh district concern in order to have his steel fabricated for tanks and shipped to the jobs ready to erect. He said he was kept practically at home by reason of the Tennessee company charging the Pittsburgh plus, Northern competitors invading New Orleans itself. He found he could have the steel fabricated in Pittsburgh and shipped to New Orleans cheaper than he could buy from Birmingham and do the fabricating himself.

F. E. Degolian, Degolian company, Atlanta, maker of steel structures, said the Pittsburgh basing plan keeps his business limited to a part of the South and prevents expansion that would keep his shop busy.

Joseph K. Barcroft, Austin Bridge Co., Atlanta, said the differential barred it from the Carolinas and territory north of Atlanta and that he had gotten into Florida only since fabricating in transit had been granted. Removal of the Pittsburgh plan would extend territory and increase business.

Kilby Car & Foundry Co. and National Forge Co., Anniston, Ala., declared Pittsburgh concerns enjoyed a distinct advantage by reason of the Pittsburgh base, which would be offset by elimination of the $5 differential.

The testimony of representatives of the Steel Products Co. and the Savannah Blow Pipe Co., Savannah, was to the effect that their business was confined to a radius of about 200 miles from Savannah on account of the "Pittsburgh plus," while Northern competitors did business in territory naturally theirs and from which they are cut off by the "Pittsburg plus."

D. H. Wood, president Converse Bridge & Steel Co., Chattanooga, testified that the American Bridge Co. could secure business in the area where the Chattanooga concern is handicapped by the Pittsburgh base. The Steel Corporation, he said, also has an advantage by ownership of the American Bridge Co., to which it could make prompt delivery of material and sell its product at a rolling mill profit through the American Bridge Co., even if it were necessary for the latter to do work at cost in order to get the business. Most of his business, witness said, is done in Tennessee and Alabama, his area being restricted to 100 to 150 miles on the east and north. Beginning at that point, he said, Pittsburgh competitors could get into the Carolinas and coast of Georgia, Florida, Louisiana and adjacent territory. With the differential removed he declared his company could get as far as Oklahoma, St. Louis, Louisville and both the Carolinas.

National Enameling & Stamping Co. Extensions

ST. LOUIS, July 11.—George W. Niedringhaus, president National Enameling & Stamping Co., has announced that new equipment costing about $1,000,000 will be installed in its Granite City plant. The new facilities, Mr. Niedringhaus said, will mean the employment of from 600 to 700 men in addition to the 4200 now at work.

The equipment to be installed includes six sheet mills for the rolling of black steel, a large 72-in. jobbing mill and a galvanized sheet department. The company now has 30 sheet mills—six at the plant in North St. Louis and 24 at Granite City.

The new mills, which will add 5000 or 6000 tons of steel a month to the present capacity of 17,000 tons, will make the company the largest independent sheet producer in the West, according to Mr. Niedringhaus. The company also produces 15,000 tons of steel plates a month.

How to Figure a Mixture is the title of a pamphlet issued by the Matthew Addy Co., First National Bank Building, Cincinnati, with offices also in Philadelphia, Pittsburgh, St. Louis and Chicago. The booklet provides for foundrymen a standard method for figuring mixtures, in the efficient and economical manufacture of gray iron castings.

Naval Gun Factory at Washington

Exceptionally Massive Machine Tools for the Production of the Heaviest Naval Ordnance—Subsidiary Work of Great Importance

BY SIDNEY G. KOON

TO prepare for a war with France, which was more or less actively prosecuted for more than a year, but which was never declared, Congress in January of 1799 appropriated a sum of money for the building of six ships of war. A part of the sum was devoted to the purchase of land for six navy yards, all of which are to-day active and one of them located in what is now the city of Washington. Some years later, an appropriation was made to establish in the Washington Navy Yard a factory for the making of guns for the navy. That gun factory, enlarged from time to time, has taken a conspicuous share in the manufacture and development of heavy guns for naval use. The latest and most important of its enlargements, started at the time the United States entered the Great War, was completed about a year ago. This latest addition is an immense machine shop capable of manufacturing guns up to 20-in. in diameter of bore and 50 calibers in length—a size much larger than has ever been built anywhere. Such a gun—exclusive of the mount upon which it would be fought—would weigh approximately 250 tons.

Loading a 16-In. Gun, 50 Calibers Long, and Weighing About 125 Tons, Upon a Truck for Shipment to the Proving Grounds, Where Each Gun Has to Pass Definite Tests. This view was taken in the new gun shop, designed for the manufacture of the heaviest pieces of naval ordnance. The crane handling the gun has 300 tons capacity

Taken as a whole, the naval gun factory is primarily organized for the manufacture of guns, mounts, sights, breech mechanisms, torpedo tubes, torpedoes, gun-firing, lighting and fire-control instruments, including telescopes and other optical instruments used by the navy in the armament of war vessels.

What the Plant Has Done and Can Do

A principal achievement of the yard during the late war was the construction of the ordnance end of the 14-in. railroad guns sent to France, and built in conjunction with the Baldwin Locomotive Works, Philadelphia, which furnished the carriages. These guns were the largest and most powerful of any guns used by either side on the Western front during the war. They had not the range of the guns which bombarded Paris, but were much more powerful and threw a much heavier shell—1400 lb. instead of 204 lb.

Still larger guns have been turned out since the war, in the shape of the 16-in. guns for the new battleships and battle cruisers of the "three-year" naval act of 1916. The heaviest of these guns will never be put on the ships for which they were designed, because all twelve of the ships which were to have received them were canceled by the limitations of armament conference, and will not be completed as designed.

Without the naval gun factory, the navy would have been unable so quickly to arm the merchant vessels during the war, and the campaign against the submarine would have been longer and much more expensive. The demand for guns, mounts, accessories and spare parts for ordnance material exceeded all expectations, and it was only by the experience and the ability of the gun factory that this material was manufactured. In addition, the guidance by the gun factory of the manufacturing plants of the country newly undertaking naval ordnance matters proved the salvation of those plants in the early and accurate production of their work.

An interesting item going through the factory at present consists of twenty gun houses for the ten light cruisers now under construction for the Government. Each of these gun houses is mounted upon a turntable and carries two 6-in. guns mounted close together, side by side. It is not a turret except in appearance, for there is no armor to keep out enemy projectiles, but it is designed to keep out the water and thus protect the gunners from spray and other disturbance. The turn-

table or base upon which these gun houses revolve is made of a single steel casting poured in the steel department, while the revolving house itself has been fabricated of steel plates in the boiler shop of the plant, in which, as it happens, no boilers have ever been built.

Melting Equipment

In addition to the building of mounts for heavy guns and to the machining of the guns themselves from forgings furnished by outside steel makers, the gun factory has its own melting equipment for steel and alloy materials, with capacity up to about 25 tons in a single unit. This melting capacity is used for the production of guns smaller in size than the monsters in the big ship turret, and also is used for auxiliary purposes, such as castings for the mounts for these guns, for turntables and other auxiliary purposes in connection with the use of the guns on shipboard. The melting equipment consists of one 20-ton open-hearth furnace, operating on an acid bottom, two 6-ton electric furnaces and four 2-ton Tropenas converters.

One interesting feature of the work lies in the fact that frequently steel from the Tropenas converters and from the electric furnaces is mixed together in a single ladle and the casting made from that mixture. For certain classes of work this has given a very satisfactory metal and one which has excellent ductile and other qualities.

A good part of the charge put into both the open-hearth furnace and the electric furnaces consists of turnings and borings from guns. These contain from 3 to 3½ per cent of nickel, which is retained in the castings made from these furnaces. There is also a small amount of copper put into these castings, in the interest of ductility. No effort, however, is made to retain chromium, although this may exist in the original scrap passed into the furnaces.

Steel and brass foundries occupy two buildings, with a total floor space of 122,000 sq. ft., of which 24,000 sq. ft. is occupied by furnaces and ovens. The steel foundry is capable of turning out 88 tons of steel in 24 hr. The largest steel casting yet poured weighed 58,000 lb. The brass foundry, which has a capacity of 1,000,000 lb. per month of non-ferrous castings, produces many castings for other Government departments, in addition to the needs of the gun factory.

A great many small castings are made in chills, it being found that these will prove sounder than sand-cast materials. Experiments have recently been made here in this direction in the casting of pistons for aircraft engines. By this means a good deal of the unsoundness in castings made in sand has been overcome and a very dense metal secured. Incidentally, this reduces largely the amount of molding work necessary and therefore decreases the cost.

Forging equipment at the factory includes one 2000-ton hydraulic press and one 1000-ton press, as well as a battery of steam hammers and drop forges. This equipment, in conjunction with the melting equipment, makes the yard independent of outside sources of supply for small and medium size forgings, while a continuous supply of steel ingots and castings is possible in the steel department.

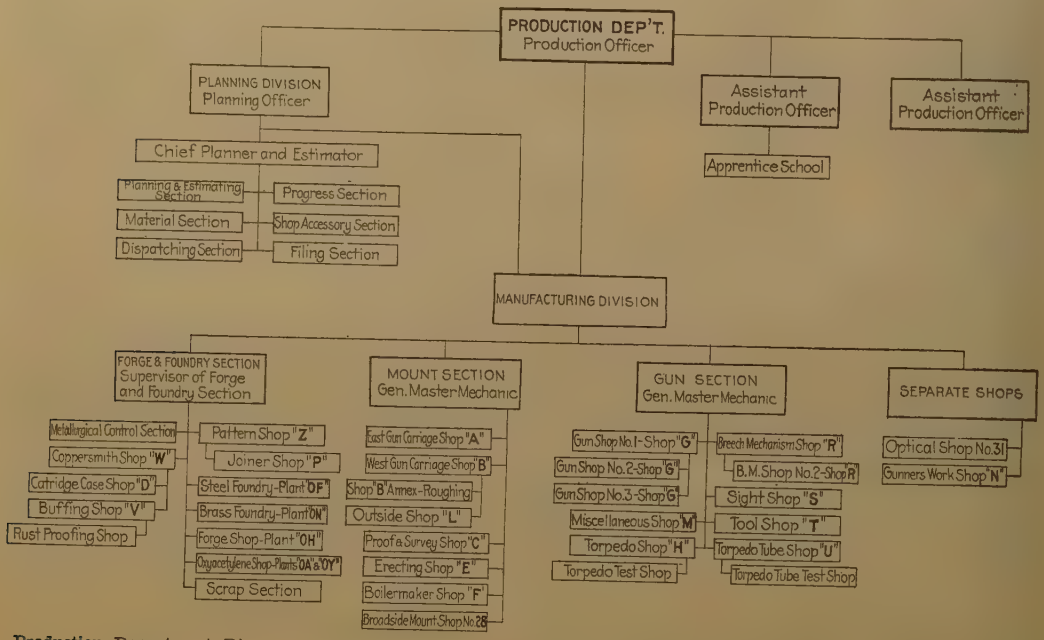
Occupying 48,000 sq. ft. of floor space, the forge shop is capable of manufacturing gun and mount forgings up to 6-in. guns, and breech mechanism forgings for all sizes of guns. It can handle ingots up to 15 tons, including the forging, annealing and application of special heat treatment processes.

Two Big Gun Shops

Until six years ago No. 1 gun shop, capable of handling 14-in. guns 50 calibers long, weighing about 91 tons, sufficed for the needs of the navy. But the more powerful ordnance called for on the ships of the "three-year" naval program required more massive equipment. This led to the designing and building of No. 2 gun shop. The two shops occupy, between them, 231,000 sq. ft. of floor space and are valued, with their equipment, at $8,500,000.

In No. 1 gun shop the largest lathe has 102-in. swing and is 180 ft. long. The longest single boring operation requires 56 8-hr. days, during which the machines are kept running continuously, 24 hr. per day, for over 18 days.

Gun Shop No. 2, which has recently been completed for the manufacture of the largest size guns, has the most modern and up-to-date high powered machinery and equipment of any plant of its kind in the United States. Its largest lathes swing 120-in. and are about 208 ft. long. These machines were designed to take a gun with a maximum length of about 85 ft., and to bore that gun or to place rifling in a bore already made. This makes necessary, in the lathe, more than double the length of the gun, besides the necessary length at the two ends to take care of the head and tail stocks and the tool holders. The lead screws on these machines are supported all along the length, so that aline-



Production Department Diagram, Showing Relationships of the Various Shops and Activities to the Directing Heads

One of the 16-In. Guns in a Large Lathe; the Boring Tool Is Seen in the Left End of the Gun. The longest of these lathes is 208 ft. over all and can swing a piece 10 ft. in diameter

ment may be maintained. The large cranes are each capable of handling 300 tons.

Three assembling pits have been provided for heat treatment and for heating preliminary to shrinkage of gun forgings or hoops over liners. These pits are 100 ft. deep and have an inside diameter of about 7 ft. Each one is large enough to take the largest gun which it is proposed to make at the yard and will easily take the largest gun which has ever been made. All three pits have electric heating elements provided by the General Electric Co.

Ordinarily, work in these pits is done at between 800 and 1000 deg. Fahr., which provides enough expansion so that a liner may be inserted in the tube, whereupon the gun is allowed to cool and grasp the liner firmly. In the same manner, liners which have partially worn out in active service are withdrawn from guns, the outside of the gun being heated by the heating elements, while the inside of the liner is cooled by sprays.

Breech mechanisms and firing locks for all calibers of guns are made in the breech mechanism shop, which covers 24,000 sq. ft. of floor space. The weights of these mechanisms vary from 11½ lb. for a 1-pounder rapid fire gun to 5500 lb. for a 16-in. gun.

Machinery for machining gun mounts is housed principally in two buildings covering 136,250 sq. ft. of floor space. The broadside mount shop, in one building, handles work for the medium and smaller caliber guns—7 in. bore and under. The mount shop for the large turret guns, including the erecting bay, is equipped with a number of unusually large machines. There are here planers 10 ft. x 10 ft. x 20 ft.; 80 in. horizontal boring mills, taking a length of 25 ft. between centers and 12 ft. vertical boring mills, handling castings up to 27 tons, 17 ft. long, 7 ft. high and 6 ft. wide.

There was completed, during the war, a 5-story machine shop having a floor space of 343,000 sq. ft. In this are manufactured torpedoes, torpedo tubes, gun sights and a large quantity of the miscellaneous detail work necessary in the assembling of complete guns. This shop also manufactures tools, jigs, fixtures, drop forging dies, gages, taps, screw dies, reamers, packed bits, drawing punches and measuring instruments. To insure interchangeability of ordnance material made in outside plants with the standard material in service, most of the gages used by the outside plants in ordnance work are made here.

Non-ferrous metals are handled in large quantities

Rifling Head at Work on a 16-In. Gun. This is an operation requiring the utmost accuracy; alinement must be perfect throughout the 69-ft. length of the gun. The rifling extends over all this length except for the enlarged powder chamber at the breech and the seat for the breech block

and special attention has been given both to aluminum and to Tobin bronze. Special study applied to the working of some of these materials has given results which were previously found impracticable. An instance of this lies in the warhead of one of the 21-in. torpedoes, made of Tobin bronze, about 1/16 in. thick. This is made in four pieces welded together. Three of the pieces form each one-third of the circumference of a cylindrical form, while the fourth forms the head or nose. These are all rolled down into the proper thickness from an ingot of considerable size cast from one of the furnaces. The nose piece is then passed through a press which forces it into the shape of a hemisphere, approximately, while the other pieces, after being rolled to the proper thickness, are bent on a circle press to the radius required. After being welded together, the entire warhead is then machined on the outside and all traces of the weld disappear. They may, however, be found on the inside. This method of manufacture has reduced the cost of these warheads considerably below what it was under the old system.

Manganese bronze has been produced in about the same way, being made on a commercial scale from scrap gathered up around the yard and elsewhere. By using this process the purchase of manganese bronze from outside smelting concerns at 35c. per lb. has been discontinued and it is now obtainable in the yard at a cost of about 16c. per lb. In many cases yellow brass castings have been used as a substitute for bronze, reducing the cost and rendering possible the utilization of scrap brass from cartridge cases, etc., which has been refined by processes developed in the yard, with the result that virgin metal is thus conserved. Development of these processes is credited to Paul A. McKinney, general master mechanic and metallurgist.

Special work carried on in the yard, in addition to that required for direct gunnery purposes, consists in optical work in the manufacture of lenses for periscope use and the manufacture of the periscopes themselves for submarine purposes. Range finders and lenses are also built here in large quantities as well as binoculars, telescopes and spotting glasses. In connection with both the optical work and gunnery work, men are detailed from the fleet to take up here a sort of apprenticeship course in the manufacture of the devices which they are later to operate on shipboard. In general, these men are detailed for one year.

The number of employees in the naval gun factory has increased from about 4100 in December, 1916, to a maximum of 9660 at the time of the armistice. Ten months later the number had fallen to about 7600 and is to-day in the neighborhood of 5500.

Control of work passing through the different shops is handled under the direction of the production engineer of the yard. The planning division maintains a live file of some 3000 cards on a visible system. Each column of cards is headed by the name of the shop through which the work represented by the card is being handled. Only the lower line on each card shows through the celluloid pocket in which the card is maintained in the file, this line recording the essential data for identification purposes. Back of the card in each pocket will be found such additional memoranda or orders as may be necessary to complete the history of each particular piece or operation.

Similar cards issued with the work are kept in the office of each shop in which the work is being done. As soon as one of these cards, marked "completed," is forwarded from the shop to the production office, it is carefully checked up with the card in the file just mentioned, and then retained in a permanent file in the production office. Meantime, the card which has been reposing in the production office file is also marked "completed" and forwarded to the accounting division for action. By this means complete control is had, at all times, of the work in process through the shop and it is possible from time to time to learn just what status the work is in.

The Navy Yard has a dual function with one head, the commandant. As commandant he has military functions distinct and separate from his industrial duties as superintendent of the naval gun factory.

About 98 per cent of the work done at the Washington Navy Yard is ordnance work performed in the shops which comprise the naval gun factory. The model tank, for testing ships' models, radio material for vessels and shore stations and a wind tunnel for testing purposes are under other bureaus of the Navy Department, the gun factory being directly under the Bureau of Ordnance.

Business Cycles Study Urged

L. W. Wallace, executive secretary of the American Engineering Council of the Federated Engineering Societies, addressed the Engineers' Club of the Youngstown district June 29 on "Principles Which Govern Industrial Stability." He said there are two forms of intermittent operation in American industry, that which occurs every seven to ten years and is commonly referred to as cyclical depression and that which is intermittent in a seasonal sense.

"The wonder is that these forms of depression have never been given the constructive thought their seriousness demands," he stated. "Their ill effects are immeasurable. While it is known in a general way that millions of workers are forced out of employment for months at a time, at no time has any authoritative information been accumulated as to the primary causes of such depressions. And there is no source to which one may turn for helpful suggestions to forestall such depressions.

"Funds to finance a comprehensive study of such depressions have been secured by the permanent committee of the President's conference on unemployment and such a study is now being made. Many beneficial results are expected. Dr. Wesley Mitchell and associates are conducting this investigation, assisted by a number of organizations. One phase is being studied by the American engineering societies, assisted by 120 groups of engineers. This is the first comprehensive study of business cycles ever undertaken and it is hoped from it will come such concerted action as will greatly reduce the ill effects of the next depression. Seasonal operations are believed by some to cause even heavier industrial and wage losses than the cyclical depressions."

The address is one of a series which Mr. Wallace is making in important industrial centers. From his headquarters in Washington, he is directing a nation-wide movement to have all the engineering groups in the country express themselves on matters of national importance involving engineering through the organization of the Federated American Engineering Societies, of which Dean Mortimer E. Cooley, of the University of Michigan, is president.

Fluorspar Scarcity Forecast

R. B. Ladoo, mineral technologist U. S. Bureau of Mines, recently spent a month in the southern Illinois and western Kentucky fluorspar field in order to complete the investigation of the fluorspar industry. The outstanding feature of the fluorspar situation is that known reserves are very low and, unless new deposits are found, fluorspar will be very scarce and expensive within a few years. The development of possible substitutes is being considered. The object of the fluorspar investigation is the eventual preparation of a bulletin on all phases of the fluorspar situation.

Existence of the zinc industry in Belgium is seriously threatened by prevailing economic conditions, according to the annual report of the largest zinc producing company in that country. A summary of the report has been received by the Department of Commerce from Consul George M. Hanson, Liege.

The Wheeling Steel Corporation has begun excavation at Tiltonville, Ohio, for 50 houses for employees of its Yorkville tin plate plant.

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To Open the Coal Mines

President Harding's proposal that the union coal miners return to work at the wages existing March 31 and that a coal commission determine a new wage scale by Aug. 10 shows a way out, and both operators and miners should accept the plan. When Secretary Hoover attempted, some months ago, to prevent a coal strike by a similar plan of arbitration the miners refused it. They did not hesitate to say that the threat of a coal strike, with the privation it would bring to all the people, was too powerful a weapon for them to give up.

Fourteen weeks of the strike have gone by, and 400,000 miners have lost millions in wages they would have received in that time. The operators have lost other millions in profits, and there has been a loss in production which may have serious consequences in some sections of the country because of fuel shortage next winter.

Since it is accepted that the soft coal industry is suffering from too many mines and too many miners, it might be considered that the stoppage of work since April is helping to correct, temporarily, an uneconomic condition, chiefly at the expense of the capital and labor of the industry itself. That evidently was the reasoning of the Administration, in waiting more than three months before taking a hand in the struggle. There is no question now, however, that the hurt the strike will inflict upon the public is the paramount consideration. Even though it is probable that, if the strike ended at once, not many more than half the striking miners would get anything like full employment, the point has now been reached where the mining of coal at union properties ought to be resumed.

It remains to be seen whether the miners' union will agree to arbitration without imposing conditions that would amount to an advance award to the strikers on one or more of the issues involved. It is not a good sign that the union representatives who felt fully authorized to reject an arbitration proposal made by the operators who were called to Washington should now cause delay on the ground that they have no power to accept the President's plan. It has been intimated in some Washington dispatches that the miners are in no haste to accept the President's proffer because they believe they have the strike won. They point to the fact that the Northwest is already beginning to feel the coal pinch, and they expect some Eastern seaboard industries to be crying for coal by another fortnight.

If the miners do not accept the President's plan, it is to be hoped he will promptly appoint a commission made up on the lines he has already suggested —three miners, three operators and five persons representing the public. The findings of such a commission would have public opinion behind them, and men who now fear to enter the mines would feel that they had backing enough to take up their jobs. The action of the President has given the situation a more hopeful look from whatever angle viewed.

While a finding as to wages is called for by Aug. 10, it is obvious that the commission will take a much longer time for its "recommendations for stabilization, avoidance of intermittency of employment and other evils." What ought to come out of the present strike and the inquiry that is to end it is some legislation that will take away from organized labor in the coal industry the power it has to take society by the throat in enforcing its demands. No like power is held by labor in any other industry save that of transportation, and there a Government curb has been partly effective at least. Public opinion will not always continue to be any better satisfied with labor union control of its fuel supply than with union control of the movement of food.

The steel output of the country is now at a rate between 36 and 37 million tons of ingots, or between 70 and 72½ per cent of capacity. Such has been the state of demand in 1922 as compared with that of 1921 that it seems likely a larger share of current business has gone to the relatively small steel making companies than was the case in 1921. Thus, while the thirty companies regularly reporting to the American Iron and Steel Institute made 87.53 per cent of the total steel last year, their share so far this year may not be over 85 per cent. The production statistics for the thirty companies for June indicate a total for the whole country of about 3,010,000 tons if the 87.5 per cent factor is used, but 3,100,000 if 85 per cent is used. The daily output works out at about 116,000 and 119,000 tons, respectively, or annual rates of 36 and 37 millions,

respectively. The actual rate, assuming it is between these figures, is 83 or 84 per cent of the record output of 1917.

Prosperity and Labor Supply

The current reviews of business conditions are heralding a return of "prosperity" and are noting that there is some scarcity of labor, with a possibility that a definite "shortage" of labor will develop. The statement of facts cannot be questioned. There is undoubtedly a measure of prosperity existing, while labor is well employed, and there are distinct prospects that in some lines what is called a shortage of labor may be found within the next few months.

Some criticism is justified, however, of the disposition shown in some of these reviews to couple "prosperity" and "labor shortage" as things that naturally and necessarily go together. On this general subject no truer statement was ever made than that by Nathaniel R. Whitney, Ph.D., in THE IRON AGE of Jan. 5, 1922: "The final test of prosperity is capacity for self-perpetuation."

Prosperity involves progress, advancement, improvement. When a people fully employed is able to do no more than provide for its daily necessities it is not advancing, it is not really prospering. When, by working hard enough and efficiently enough it can, for instance, provide for its daily necessities with two-thirds of its work and with the other third make improvements, or put by savings for future improvements, it is advancing and prospering.

If this operation proceeds smoothly and the spending is done uniformly, every one is employed. Some are working to provide the common everyday necessities, others are working to provide the improvements, made out of the savings. It may be inconvenient for the individual to spend his savings as he goes, the savings representing the excess of his income over what is required to provide him with daily necessities. Individuals may accumulate and spend the accumulations in lump sums. Some individuals may borrow and spend a lump sum, as for a dwelling house, intending to pay the indebtedness with the savings of future years.

When a so-called "shortage of labor" exists, the condition suggested is that of an abnormally heavy spending of accumulations or savings at that particular time. If such spending is abnormally great at one time it must be abnormally little at another time, in order to balance the average.

It may be said that all this is elementary and well understood. That may be, but sometimes we do not keep in mind the obvious. "The final test of prosperity is capacity for self-perpetuation." The real prosperity lies in the saving, not in the spending. Abnormally great spending of savings in a time of labor shortage may mean the reverse of prosperity. Two men each save $1,000 a year for ten years, and each spends $10,000 erecting a dwelling house. It is a detail whether the investment is made in the third year or the seventh year of the saving, the remainder being borrowed. One man builds when costs are high, i.e., there is a "labor shortage," the other when costs are low. The first man gets less, in the intrinsic value of the house, than the second man. He has prospered less, although both have saved the same amount and spent the same amount.

Increase in Electric Steel Castings

Two facts stand out in the statistics of electric steel production in the United States in 1921. One is the rapid increase in the output of electric alloy steel castings and the other is the large proportion of steel castings of all kinds made electrically. Both records are noteworthy, despite the fact that the year was one of acute depression.

According to the statistics of the American Iron and Steel Institute only 63,246 tons of electric alloy steel ingots and castings were made in 1921, but of this total 10,084 tons or 15.9 per cent was castings. In 1920 electric alloy steel castings were 11,710 tons out of a total electric steel alloy output of 245,572 tons, or only 4.8 per cent. Part of the gain is due to the use of heat-treated alloy castings as substitutes for forgings.

For the first time steel castings were more than half the total electric steel output, the actual percentage being 50.3. In 1920 only 30.9 per cent of the total was steel castings. Of almost equal importance is the fact that in 1921 steel castings made in electric furnaces were a larger proportion of all steel castings made than ever before. Out of a total of 559,713 tons of steel castings, 85,095 tons or 15.2 per cent was made in electric furnaces. Eleven years ago, at 1878 tons, electric steel castings represented only 1.2 per cent.

The output of electric steel ingots last year was 84,404 tons, or 4.39 per cent of all steel ingots. This compares with 8.48 per cent in 1920 and 9.36 per cent in 1918, the record year in electric steel. Ten years ago ingots made electrically amounted to only 1.2 per cent of the total.

While the electric steel output last year (at 169,499 tons) was much smaller than in 1919 and 1920, it exceeded that of the war year 1916 (168,918 tons) and was far more than that of any year previous. In 1916 the total electric steel output was but 3.7 per cent of the total steel production; in 1921 it was 8.6 per cent and in 1920, 11.9 per cent.

While the outstanding fact in the 1921 record of electric steel was the high percentage of electric alloy steel castings, the industry as a whole made excellent progress—a progress unexpected under the conditions. The record last year shows that the electric furnace has taken a firm hold on the steel foundry. It is probable that 1922 will write an even more interesting record for all departments of this comparatively new industry.

Conditions in the British iron and steel industry are rapidly improving, if the values of iron and steel shares are a criterion. Data published from the office of the National Federation of Iron and Steel Manufacturers, London, show that the market value of the shares of 24 iron and steel companies fell to an average of 73.8 on Feb. 14,

1922. On April 28 the same shares had risen to 85.5 and on May 15 stood at 82.5. Taking 6 iron and coal companies, 9 iron, steel and engineering companies and the 24 iron and steel companies, the average for the shares of the 39 organizations rose uninterruptedly from 79.0 on Feb. 14 to 95.5 on May 15. On March 31, 1920, the same shares averaged 163.9, from which figure there was an almost uninterrupted decline to the average of 79 in February of last year.

Power Sources of Utilities

The Geological Survey reports monthly the production of electric power by public utility plants. Quantities in the first five months of this year were as follows, in thousands of kilowatt hours:

	Water Power	Fuel	Total
January	1,293,439	2,512,309	3,805,748
February	1,220,922	2,246,924	3,467,846
March	1,467,832	2,354,134	3,821,966
April	1,492,249	2,109,459	3,601,708
May	1,626,711	2,173,223	3,799,934

The variations in the monthly totals are due chiefly to difference in the length of months, but May showed an increase of 2.1 per cent over April in daily output. At the most, only a slight decrease in production of power by plants using coal could be traced to the coal strike. There is a significant gain in the production by water power representing, in all probability, a regular growth of this industry, aided by improvement in business conditions. The May production was the highest thus far attained.

Returns are received from about 3500 power plants, each producing 10,000 kilowatt-hours or more a month, engaged in public service, including central stations, electric railroads and certain other plants that contribute to the public supply. The capacity of reporting plants is about 90 per cent of the total of all listed, and the figures given above include estimates for the 10 per cent not reporting.

The proportion of the total produced by water power rose from 34 per cent in January to 43 per cent in May. Thus the use of water power in connection with public utilities has reached decidedly important proportions. Of the total produced by water power in May, California led with 21 per cent, New York coming second with 16 per cent and Washington third with 6 per cent. The remainder was widely distributed, only four States and the District of Columbia failing to contribute. The fuel consumed in May was as follows:

Coal, net tons	2,484,500
Fuel oil, barrels	828,981
Natural gas, M cu. ft	2,206,473

At intervals the Geological Survey estimates the coal consumption per kilowatt-hour by counting out oil, gas and wood, and has found the consumption to have averaged as follows: 1919, 3.17 pounds; 1920, 3.00 pounds; 1921, 2.73 pounds, showing a marked increase in efficiency.

The total consumption of coal in calendar years was as follows: 1919, 35,100,000 net tons; 1920, 37,244,000 tons; 1921, 31,573,000 tons. The May consumption was at the rate of 29,200,000 tons a year. The normal for the nearby future may be taken at fully 30,000,000 tons, while normal coal production for the country may be taken at fully 600,000,000 tons. Public utilities are responsible, therefore, for 5 per cent of the coal consumption. Using a factor of 2.73 pounds of coal per kilowatt-hour, the electricity produced by water power in May represented 2,220,000 tons of coal, or at the rate of 26,000,000 tons a year. Thus the use of water power in this one connection is saving the country the labor of getting 4 per cent as much coal as it still has to secure.

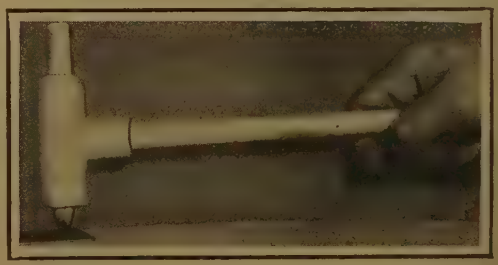
The rapid expansion in the iron and steel production of France is the feature of recent developments in world output. For the first four months of this year the average monthly output of both pig iron and steel in France has exceeded not only the 1921 production but also that of 1920, a year of large output in all countries. Pig iron and steel in the first four months of 1922 averaged 345,500 and 325,500 tons per month respectively, against 275,700 tons and 281,700 tons per month of pig iron in 1921 and 1920 respectively, with corresponding steel outputs of 250,900 and 250,200 tons. It is noteworthy also that the steel exports have not increased with this production, but rather have sharply declined. No other producing country can show an output larger thus far this year than in 1920. The domestic needs of France are evidently large, both for the devasted sections and for the large and industrially important districts added by the fortunes of war.

CORRESPONDENCE

Hammer for Stamping Single Letters

To the Editor: Whenever there is a sufficient number of pieces to be stamped with a single letter or figure, the holder shown in the accompanying illustration will greatly facilitate the work.

The particular instance which originally furnished the necessity for this device was an occasion when several thousand brass strips required an identifying letter stamped near the end. Progress was slow, and the work tedious when a hammer and loose stamp were used in the ordinary manner. The whole thing was speeded up and made decidedly easier for the inspector by the adoption of the hammer stamp shown.



The materials required are a length of ½-in. pipe for the handle, a strong pattern tee for the head, and a short piece of pipe, fitting the top end of tee. The stamp is held by inserting it on the tee until it touches the end of the short pipe, and screwing in the handle until it tightens the stamp against the opposite thread walls. The use of a strong pattern tee of the size named gives just the right weight and balance.

HARRY MOORE.

Rosemount, Montreal, Can.

Hopeful as to Coal Strike Situation

White House Confident Satisfactory Adjustment Will Soon Be Reached—Assurance That Country Will Be Supplied With Coal

BY L. W. MOFFETT

WASHINGTON, July 11.—Confidence was expressed this afternoon at the White House that the coal strike situation would be worked out satisfactorily soon. It was further stated that in any event the country will be supplied with coal. The statements were made with such apparent assurance that they have led to the belief that the operators and miners will accept the proposal made by the President yesterday to bring about a settlement of the strike through an arbitration commission to consist of five appointees of the President and three representatives each for the operators and miners. But it was indicated that if the Government's proposal is not accepted, it will resort to other means to bring about resumption of coal production at an early date. The proposal for setting up a coal commission to arbitrate the strike is predicated upon the immediate return of the strikers to the mines at the old scale of wages. Meanwhile the commission would make investigation of the coal industry as to cost and develop plans for the elimination of waste of the high cost mines.

Attitude of Operators

The bituminous operators have informed the President that they will consider his plan and while they have authority to accept it or reject it at the present conference, President John L. Lewis of the United Mine Workers told the Chief Executive that officials of the union here did not have power to pass upon the proposal, but would have to refer it to the Policy Committee of the union. At the suggestion of the President, both the operators and the miners are to give their final answer on Saturday of the present week. The same proposal relates to the anthracite operators and miners, and it was stated that their reply is to be made on Wednesday of the present week.

While there has been considerable criticism of the attitude of the miners, who say they are unable to act until approval has been given by the Policy Committee, making it necessary to further delay negotiations, it is evident that the Administration is satisfied that its proposal will be accepted and that coal production will be resumed at an early date. Apparently it is thought that it will not be necessary to resort to other means, but at the same time it was indicated that if this latter course is necessary in order to insure supply of coal, other methods will be adopted. The railroad strike has complicated the situation and in some quarters the opinion has been expressed that the miners purposely are delaying settlement in order to see if railroad strikers gain strength and that, if they do, it will give added power to the striking miners and put them in a position to make further demands before the strike is settled.

Agreement Violated

While it is announced this morning that Secretary of Commerce Hoover has called a conference for the latter part of the present week of non-union bituminous coal operators, which will relate to prices at the mines, it was stated that some of the smaller mines, particularly those in western Kentucky and in one district of Pennsylvania are violating the agreement made with Mr. Hoover which fixed prices at $3.50 per ton as a maximum. It is stated that some of the smaller producers have increased prices considerably over this figure and have been advancing them at the rate of 50c. per ton per week. At the same time, it was stated that the larger operators are living up to the agreement in every respect and that some are selling at less than the agreed price, asking from $2.90 to $3 per ton and refusing as high as $5 per ton when offered.

Serious Conditions for Iron and Steel Industries

PITTSBURGH, July 11.—The coal strike situation now is more serious from the standpoint of the iron and steel industry than it has been at any time since the outbreak of the trouble, despite the action taken by the President looking toward an early settlement. The President's suggestion, that the men go back to work at the 1920 scale pending an investigation and a report by a committee to be appointed for the purpose of devising an equitable adjustment, is regarded in both iron and steel and coal trade circles here as favorable to the miners, and there is considerable doubt of its acceptance by the operators. It is considered impossible for the committee, no matter how promptly it gets to work, to make an investigation and report by Aug. 10, the date mentioned by the President, and since the President's plan provides that in the event the commission is unable to report its scale by Aug. 10, it shall have power to direct continued work under the old scale until the superseding scale is ready, fear is expressed by operators that the high scale of wages might be continued for an indefinite period.

The opinion also is expressed that the President has given more consideration to the probable winter requirements than he has to the cost of coal to consumers or to whether the operators shall have a profit. There is also the question of the effect of the higher wage scale in the union than in the non-union field. To restore the 1920 scale in the non-union districts would mean an increase in wages, since scales in these districts have been considerably reduced in the past two years. Not only that, but to establish the union scale in the non-union fields would be tantamount to recognizing the union in the non-union districts, and this is something that is bound to meet with considerable opposition. It is hardly probable that in the Connellsville district, for example, the men who have gone out and now are members of the union would be willing to resume work at $4.50 to $5 per day with the union scale of $7.50 per day re-established. The union organizers in this district can be depended upon to work this argument overtime in their efforts to effect a unification. Common opinion is that resumption in the union fields would be accompanied by a

suspension in the non-union fields because of the wide difference in the wage scale.

Conditions Are Worse

The general situation has grown worse instead of better since last week as far as production is concerned. There have been further losses among the active non-union mines in the past week and coal is extremely hard to obtain here, even at materially higher prices than hitherto have prevailed since the strike began. Local coal now is not available at less than $4.25 per net ton oven for steam or by-product grade, while in the Southern field the common price to-day is $4 a ton at mines, as against the maximum of $3.50 agreed upon at the Hoover conference of May 31 last. Moreover, it is getting harder to get coal out of the Southern field than formerly because of car congestions and the fact that the railroad operating men are giving some aid to the striking shop men.

Railroad Troubles

It is reported that the Louisville & Nashville Railroad is conserving its motive power for passengers, perishable food and mail traffic and is declining coal business. The Chesapeake & Ohio Railroad is having trouble about coal shipments because the train crews in many instances are refusing to haul loaded cars of coal on the ground that the cars are in bad shape and in need of inspection and repairs. Coke supplies are getting more limited daily, and with the difficulty attending the movement of coal to steel company by-product plants, there is an imminent danger that some of the blast furnaces now active may soon be obliged to suspend. It is reported that a western Pennsylvania steel manufacturer has been obliged to put down a furnace through lack of sufficient coke, and it is currently reported that one of the reasons why there was such a complete suspension of steel works activities over the Fourth of July was for the purpose of building up stocks of pig iron. It is pretty well established that steel works activities have been on a heavier scale than blast furnace operations and this hardly would be the case if coke supplies were ample. Such small lots of coke as are to be had to-day command around $10 per ton at oven, and there is no distinction between furnace and foundry grade.

IMPORTANT FREIGHT CHANGE

Proposed Rate Opposed by Chicago and St. Louis and Favored by Pittsburgh Steel Men

WASHINGTON, July 11.—With Chicago and St. Louis iron and steel interests and a group of rail lines opposing it and iron and steel producers in the Pittsburgh and surrounding districts favoring it, a freight tariff supplement has been filed by Agent Leland with the Interstate Commerce Commission, to be effective July 15, establishing a proportional rate of 20c. per 100 lb. on practically all iron and steel products from the three lower Mississippi crossings, New Orleans, Baton Rouge, and Anchorage, La., to the Galveston, Houston, Beaumont and Orange groups in Texas. The tariff apparently was filed because of the desire of Southern rail carriers to meet water competition, especially Gulf Coast lines. It has been protested by the all-rail lines from St. Louis together with steel producers in Chicago, St. Louis and other points in a position to use the barge service on the Mississippi River. It is claimed by protesting steel makers that the rate would be unduly low and the protesting rail lines also say the rate would have a tendency to break down their rates to Texas common point territory and probably destroy the adjustment to St. Louis.

Mr. Townsend's Position

The attitude of Pittsburgh and other producers who have asked that the commission allow the tariff to become effective on the date proposed is expressed in a telegram to the commission to-day from J. F. Townsend, traffic manager of the National Tube Co., Pittsburgh. Mr. Townsend defended the rate on the ground that it did not compare unfavorably with rates on iron and steel products, particularly wrought pipe, which were available to those asking for the suspension of the supplement. Mr. Townsend says that the National Tube Co. is interested in the proportional rate of 20c. so that it could take advantage of the rate by shipping down the Ohio and Mississippi rivers for delivery to the rail lines at the three lower Mississippi River crossings. He compares the proposed rate with rates on other iron and steel articles from lower Mississippi River crossings to the Houston group. He asserts that competitors at both Birmingham and Chicago enjoy a lower basis of rates to the Houston group.

Reason for Proposing Rate

The 20c. proportional rate was proposed, it is stated, with the idea that the rail lines from the three crossings would be able to obtain business brought to those points by barges from Ohio and Mississippi River points in competition with iron and steel moving from Atlantic ports, particularly from Philadelphia to Galveston. The supplement also has been taken to be an admission on the part of at least some rail lines that competition by water has reappeared as an important factor, with which they will have to deal. It also was taken to be recognition of the fact that coastwise competition again is being felt. It was not, however, openly acknowledged that water competition was forcing the proposed rate. Apparently such an attitude was avoided, so as not to subject the rate to the law which provides that when a rate is lowered to meet water competition, it may not be advanced except upon a showing of a change in conditions other than the disappearance of such competition by water. The proposed rate has been the source of considerable discussion in shipping and railroad circles because of its probable effect, if it is allowed to become operative, upon the all-rail rate structure in the Southwest.

One Possible Result

One view was that it would force the all-rail lines from St. Louis to reduce their rates because the combination on the three lower river crossings would be lower than that based on St. Louis. In the case of joint rates, it was contended that lines both east and west of the Mississippi River would have to cut their rates or obtain fourth section permission to continue joint rates in excess of the aggregate of the intermediates. Others, however, maintained that if the supplement were properly limited to show the rate would be applicable only to tonnage brought to the crossings by water, there would be no violation of the fourth section. Some shipping circles expressed the view that the rate in itself would increase competition between producers in the Pittsburgh and surrounding territory with Chicago and St. Louis and eastern steel makers, for business in the Southwest.

Pamphlet on Malleable Iron

The daily service that is being rendered by one of the important branches of the iron and steel business is outlined in a pamphlet entitled "Certified Malleable in Transportation and Industry," issued by the American Malleable Castings Association, Cleveland. It tells the story of certified malleable castings, outlining the means employed by the association in bringing the product of its members to a uniformly high standard and maintaining it at that point. It will be sent to interested persons upon written request to the American Malleable Castings Association, 1900 Euclid Building, Cleveland.

FABRICATED STEEL BUSINESS

Bridge and Building Awards and Tonnages Pending at Leading Centers

Awards for fabricated steel work for the past week include the following:

Tribune Building, West Fortieth Street, New York, 500 tons, to Levering & Garrigues Co.; tonnage of reinforcing bars also required.

Bridges for the Baltimore & Ohio Railroad, 400 tons, to Fort Pitt Bridge Works.

Foundry building for Frick Foundry Co., Waynesboro, Pa., 700 tons, to a local fabricator.

Power plant for the United Gas Improvement Co., Philadelphia, 300 tons, to Belmont Iron Works.

Hotel at Nassau, Bahamas, 1000 tons, to Hedden Iron Construction Co.

Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich., 750 tons to Rochester Bridge Co., instead of American Bridge Co., as reported last week.

Speedway and Grandstand, Kansas City, Mo., 500 tons to Kansas City Structural Steel Co.

W. B. Maxwell, Casper, Wyo., two 80,000-bbl. tanks, 589 tons to Chicago Bridge & Iron Works.

Trimountain Mining Co., Rock House for No. 2 Shaft, Trimountain, Mich., 290 tons to Wisconsin Bridge & Iron Co.

Rollman Department Store, Cincinnati, 697 tons to American Bridge Co., award of general contract noted in the issue of June 29.

Illinois Central, deck plate girder span and structural steel, Matterson, Ill., 511 tons to American Bridge Co.

Methodist-Episcopal Parish House, Champaign, Ill., 250 tons to Mississippi Valley Structural Steel Co.

Moss Bluff Bridge, Lake Charles, La., 350 tons to Milwaukee Bridge Co.

International Harvester Co., addition to concentrating plant, Hawkins Mine, Nashwauk, Minn., 375 tons to McClintic-Marshall Co.

First National Bank Building, Ironton, Ohio, 300 tons to Mt. Vernon Bridge Co., previously reported to Fort Pitt Bridge Co.

Dams No. 36 and 38, Ohio River, 620 tons, Independent Bridge Co., low bidder.

State Highway Commission of Wisconsin, miscellaneous bridge work, 400 tons, to Worden-Allen Co.

Manitowoc, Wis., new high school, 125 tons, to Lakeside Bridge & Steel Co., Milwaukee.

Indiana Hydro-Electric Co., Norway, Ind., head gates, 200 tons, to Lakeside Bridge & Steel Co.

The Gillsy Hotel, Cleveland, additional, 200 tons to the Forest City Steel & Iron Co.

Painter's Building, Cleveland, 170 tons, to the Forest City Steel & Iron Co.

Ann Arbor Railroad, bridges, 300 tons, to the American Bridge Co.

South High School, Columbus, 200 tons, to the Fort Pitt Bridge Works.

Western Reserve University, medical department group, Cleveland, 500 tons.

Addition to the Summit County Court House, Akron, Ohio, 500 tons.

National Union Fire Insurance Co., Schenley district, Pittsburgh, 300 tons, to McClintic-Marshall Co.

Structural Projects Pending

Inquiries for fabricated steel work which may be added to lists of pending projects include the following:

Brooklyn Edison Co., Brooklyn, power plant, 9000 to 10,000 tons.

Public Service Corporation, Newark, N. J., power plant, 2000 tons.

International House, Riverside Drive, near Grant's Tomb, New York, 1800 tons.

Chamber of Commerce of the United States, Washington, D. C., 1000 tons.

Hospital for the Friedman Home, New York, 500 tons.

City piers, Portland, Me., 1000 tons.

Highway bridge over Susquehanna River, Lycoming County, Pa., 1200 tons.

High school, Elmira, N. Y., 1000 tons.

Department store at Poughkeepsie, N. Y., 400 tons.

Loft building on West Forty-fifth Street, New York, 750 tons, to Hay Foundry & Iron Works.

J. B. Book Building, Detroit, 1300 tons.

Western Electric Co., new shop building, Hawthorne, Ill., 1000 tons.

Nebraska State Capitol, Lincoln, 1000 tons, revised bids to be in July 12.

Addition to plant of Warner Elevator Co., Cincinnati, 215 tons, bids in.

St. Francis Seminary, Cincinnati, 200 tons, bids being taken.

Roosevelt School, Dayton, Ohio, 230 tons, bids being taken.

Pittsburgh & Lake Erie Railroad Co., South Smithfield Street, Pittsburgh, C. M. Yoke, purchasing agent, 1625 tons of fabricated steel work, bids received to July 17.

Wisconsin General Hospital, Madison, Wis., 250 tons, bids in.

Railroad Equipment Business

One result of the shopmen's strike has been to cause railroads to put out inquiries for car repairs which they had expected to take care of in their own shops. The Rock Island is inquiring for figures on the reconstruction of 500 National dump cars and heavy repairs on box, refrigerator and furniture cars, totaling possibly 2000 in all. The St. Paul wants heavy repairs on 1000 or more box cars. The Northwestern is inquiring for heavy repairs on various classes of freight equipment, while the Burlington wants heavy repairs on box and coal cars. The Baltimore & Ohio is figuring with car builders on repairs to 6000 cars.

Considerable locomotive business has appeared, as noted below, including orders reported by the American Locomotive Co. for 29 locomotives, of which 25 were mentioned in this column last week. Itemized, the orders and inquiries include the following:

The Illinois Central Railroad is inquiring for 500 to 1000 new composite gondolas.

Another new inquiry is from the Pittsburgh & West Virginia for 1000 all-steel, 55-ton hopper cars.

The Northern Pacific has ordered 250 gondola cars from the Standard Steel Car Co.

The Norfolk & Western has placed 2000 hopper cars and still has 1000 box cars to buy. The distribution of the hopper cars follows: 500 each to American Car & Foundry Co. and Standard Steel Car Co., and 1000 to Pressed Steel Car Co.

The Osgood-Bradley Car Co., Worcester, Mass., has been awarded a contract by the Argentine State Railway for 27 steel passenger coaches, 6 steel parlor cars, 10 steel dining cars and 10 steel baggage cars.

The United Verde Copper Co., Clarksdale, Ariz., placed 24 ore cars with the Western Steel Car & Foundry Co.

The Illinois Central is in the market for 25 Mikado type, 25 Santa Fe type engines and 15 switch engines.

The Nashville, Chattanooga & St. Louis has ordered 5 Mikado type and 3 mountain type locomotives from the Baldwin Locomotive Works.

The Delaware, Lackawanna & Western is inquiring for 25 Mikado type and 5 Pacific type engines.

The Norfolk Southern has ordered 5 consolidation type locomotives from the Baldwin Locomotive Works.

The Chicago & Eastern Illinois has placed 6 Pacific type engines with the Lima Locomotive Co.

The orders for locomotives received by the American Locomotive Co. are as follows: Chicago & Eastern Illinois, 10 Mikado type, weighing 315,000 lb.; Southern Railway, 15 Mikado type, weighing 288,000 lb.; Central America of Cuba, 1 mogul type, weighing 111,000 lb.; National Enameling Co., Granite City, Ill., 1 switching locomotive, weighing 141,000 lb.; Pittsburgh Plate Glass Co., Zanesville, Ohio, 1 switching locomotive, weighing 65,000 lb.; Delaware & Hudson Co., 1 consolidation type, weighing 312,000 lb.

Effects of Hot Weather

YOUNGSTOWN, OHIO, July 11.—Hot weather throughout the Middle West is cutting into sheet mill operations to a greater extent this week than at any time during the year. Lower priced workers are drifting to outside forms of employment. Mills were scheduled at 98 per cent at the first of the week, but actual operating is at a lessened rate.

Of 17 pipe furnaces in the Valley, 16 are fired. District steel capacity is scheduled at 85 per cent.

Iron and Steel Markets

FACING CURTAILMENT

Coal Situation More Serious for the Steel Industry

Railroad Strike Cuts Down Supply—Some Reductions in Pig Iron

The coal situation has grown more serious in the past week from the standpoint of the steel industry. This is due in part to lessened production of coal last week, but largely to car shortages and congestion produced by the strike of railroad shopmen.

Conditions are so acute with the Norfolk & Western, Louisville & Nashville and Chesapeake & Ohio railroads, which have been moving coal from Kentucky and West Virginia mines to coke ovens and steel works in western Pennsylvania and Ohio, that a number of pig iron producers are facing blast furnace shutdowns. Coal shipments on the Chesapeake & Ohio have been reduced by 50 per cent in the past few days.

The Steel Corporation is now operating at slightly less than 75 per cent of steel-making capacity, as against more than 77 per cent in the two or three weeks preceding. Some independent steel companies are doing nearly as well, but several will be forced to curtail production if the situation is not soon relieved.

While a hopeful view is taken of the outlook for early resumption of coal mining under the President's plan, the railroad congestion, it is feared, may go farther, with the season of grain movement just ahead. The iron ore movement in Minnesota has not been affected, 25 per cent of the Steel Corporation's shopmen remaining at work. On the Bessemer & Lake Erie railroad, which takes ore from Lake Erie to the Pittsburgh district, none of the shopmen went out.

The June output of steel ingots did not show the expected increase, the estimated daily rate for the country being 115,761 tons, as against 114,717 tons in May and the July rate promises to be less than either. The Steel Corporation's increase of 381,000 tons in unfilled orders last month bore out what was reported week by week of the continued pressure upon the mills.

Regardless of developments in the coal strike, the steel companies see little prospect of a material increase in their output in view of the scarcity of iron and steel works labor. Any increase in wages at non-union coal mines that might result from the return of union miners to work at their old wages would have its effect also on the steel works labor situation.

While new business going to the steel mills is less, the difficulties of consumers in getting shipments have increased. As is usual in times of congestion, small sizes of bars, shapes and other products are hard to get, the mills preferring rollings that run into larger tonnages.

The cotton tie season has opened with transactions at $1.10 per bundle, Pittsburgh, though business is reported at $1.07. Last year's price was $1.35. European mills have little chance at this market on the present basis, which is the lowest since 1915. Recent foreign quotations have been based on $1.38, Liverpool or Antwerp. At 22c. for cotton the Southern planter gets nine times as much for cotton ties as he pays, since the ties are weighed with the bale.

A notable feature of the past week has been the number and size of orders from the railroads for car and locomotive repair work in view of the idleness of their own shops. Three large lines have asked for bids on repairing 9000 cars. New locomotive business is of good volume also. In the past two weeks orders have come out for 62 engines and active inquiries call for 119.

The Union Pacific has placed 12,000 tons of rails at Chicago and the Southern Pacific has given a new order to the Tennessee company's mill at Ensley, Ala.

Awards of fabricated steel work fell off sharply in the week, but fresh projects, including 26,000 tons in 20 different jobs, show no cessation of interest in building.

At Chicago the outlook for agricultural implement works shows further improvement, and steel mills are getting more business from this source.

Owing to uncertainties as to the coke supply, both buyers and sellers of pig iron are very cautious and few important transactions have been recorded. Alabama iron is again quoted at $18, a decline of 50c., but the Southern situation as to stocks is strong, as only 44,000 tons was on hand July 1, compared with 232,000 tons a year ago and 60,000 on June 1 last. The melt of Southern iron is the largest ever known. Sharp reductions in pig iron rates from Birmingham to Cincinnati, Louisville and St. Louis below those recently announced, will make the Southern product a more important factor in those cities in competition with Northern iron. Basic iron has declined $1 at Pittsburgh to a basis of $24, Valley.

Continental prices and markets are unsettled, owing to the demoralized exchanges. Our cable reports rejections of German steel products on the Continent and in Great Britain because of the use of inferior raw materials and unsuitable scrap.

Pittsburgh

Coal Strike Causes Much Anxiety—Basic Pig Iron Declines

PITTSBURGH, July 11.—The danger of curtailment in the production of iron and steel as a result of the coal strike situation is more serious now than it has been at any time since the outbreak of the trouble 14 weeks ago.

With the possibility that the 1920 scale is to prevail, at least until a committee can investigate the entire situation and report back, the attempt of some of the union mine operators to resume on an open shop basis has been practically a failure, and in the non-union districts the argument has been effectively used that men are foolish to stay at work at present scales

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	July 11, 1922	July 3, 1922	June 13, 1922	July 12, 1921
No. 2X, Philadelphia‡	$27.64	$27.64	$26.82	$25.50
No. 2, Valley furnace†	24.00	24.00	24.00	20.50
No. 2, Southern, Cin'ti†	*21.58*	22.55	23.00	24.50
No. 2, Birmingham, Ala.†	*18.00*	18.50	18.50	20.00
No. 2 foundry, Chicago*	24.00	24.00	23.00	19.00
Basic, del'd, eastern Pa.	25.75	25.75	25.00	23.50
Basic, Valley furnace	*24.00*	25.00	25.00	19.50
Valley Bessemer, del. P'gh	26.77	26.77	26.96	22.96
Malleable, Chicago*	24.00	24.00	23.00	19.00
Malleable, Valley	24.50	24.50	24.50	21.00
Gray forge, Pittsburgh	25.27	25.27	25.46	21.46
L. S. charcoal, Chicago	31.65	31.65	29.00	36.00
Ferromanganese, seaboard	67.50	67.50	67.50	70.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$40.00	$40.00	$40.00	$47.00
Bess. billets, Pittsburgh	35.00	35.00	35.00	33.00
O.-h. billets, Pittsburgh	35.00	35.00	35.00	33.00
O.-h. sheet bars, P'gh	35.00	35.00	35.00	35.00
Forging billets, base, P'gh	40.00	40.00	40.00	38.00
O.-h. billets, Phila	40.17	40.17	40.74	38.74
Wire rods, Pittsburgh	40.00	40.00	38.00	43.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	1.70	1.70	1.70	2.00
Light rails at mill	**1.75**	1.70	1.50	2.10
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	1.925	1.925	1.96	2.15
Iron bars, Chicago	1.80	1.80	1.75	2.00
Steel bars, Pittsburgh	1.70	1.70	1.70	1.90
Steel bars, Chicago	1.75	1.75	1.75	2.28
Steel bars, New York	2.04	2.04	1.98	2.28
Tank plates, Pittsburgh	1.70	1.70	1.60	1.90
Tank plates, Chicago	1.75	1.75	1.75	2.28
Tank plates, New York	2.04	2.04	1.98	2.28
Beams, Pittsburgh	1.70	1.70	1.60	2.00
Beams, Chicago	1.75	1.75	1.75	2.38
Beams, New York	2.04	2.04	1.98	2.38
Steel hoops, Pittsburgh	2.50	2.50	2.40	2.50

Sheets, Nails and Wire,	July 11, 1922	July 3, 1922	June 13, 1922	July 12, 1921
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	3.15	3.15	3.15	3.50
Sheets, galv., No. 28, P'gh	4.15	4.15	4.15	4.50
Sheets, blue an'l'd, 9 & 10	2.40	2.40	2.40	2.65
Wire nails, Pittsburgh	2.40	2.40	2.40	2.75
Plain wire, Pittsburgh	2.25	2.25	2.25	2.50
Barbed wire, galv., P'gh	3.05	3.05	3.05	3.10
Tin plate, 100-lb. box, P'gh	$4.75	$4.75	$4.75	$5.75
Old Material, Per Gross Ton:				
Carwheels, Chicago	**$19.50**	$18.50	$18.25	$13.25
Carwheels, Philadelphia	17.50	17.50	17.00	16.00
Heavy steel scrap, P'gh	17.50	17.50	17.00	12.00
Heavy steel scrap, Phila	15.00	15.00	15.00	11.00
Heavy steel scrap, Ch'go	**15.50**	15.00	14.50	10.00
No. 1 cast, Pittsburgh	19.00	19.00	18.50	16.00
No. 1 cast, Philadelphia	17.50	17.50	19.00	16.00
No. 1 cast, Ch'go (net ton)	17.00	17.00	16.00	12.50
No. 1 RR. wrot, Phila	17.00	17.00	17.00	13.50
No. 1 RR. wrot, Ch'go (net)	13.50	13.50	12.50	9.25
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	**$9.50**	$8.50	$6.50	$2.75
Foundry coke, prompt	**10.00**	9.00	7.00	4.00
Metals,				
Per Lb. to Large Buyers	Cents	Cents	Cents	Cents
Lake copper, New York	**14.00**	13.75	14.00	12.75
Electrolytic copper, refinery	**13.75**	13.50	13.75	12.62½
Zinc, St. Louis	**5.52½**	5.35	5.42½	4.30
Zinc, New York	**5.87½**	5.70	5.77½	4.80
Lead, St. Louis	*5.50*	5.55	5.60	4.35
Lead, New York	5.75	5.75	5.90	4.40
Tin (Straits), New York	31.12½	....	31.00	28.50
Antimony (Asiatic), N. Y.	5.00	5.00	5.25	4.75

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price, July 11, 1922, Finished Steel, 2.169c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

July 3, 1922,	2.169c.
June 13, 1922,	2.141c.
July 12, 1921,	2.493c.
10-year pre-war average,	1.689c.

These products constitute 88 per cent of the United States output of finished steel

Composite Price, July 11, 1922, Pig Iron, $23.61 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

July 3, 1922,	$24.19
June 13, 1922,	23.39
July 12, 1921,	20.50
10-year pre-war average,	15.72

when by throwing their lot with the unions they can get much better wages. Not only has the fuel supply situation in this district grown very much tighter in the past week, but on account of the strike of the car shopmen and railroad congestions growing out of the unusually heavy operations of Southern mines, coal supplies from the South lately have been very hard to obtain.

One western Pennsylvania steel works blast furnace has gone down in the past week because of the scarcity of coke, and as both beehive and by-product ovens are finding it increasingly difficult to keep up production because of the lighter supply of coal, it would not be surprising if other furnaces soon were obliged to suspend.

The steel market generally is quieter than it has been, and while this is partly ascribed to the unwillingness of producers to add further to their obligations, it is a fact that buyers believe themselves to be protected against their probable requirements over the next few months and are not taking hold as eagerly as they did recently. There is no let-up in the demand for steel bars or for tubular goods, but in practically all other finished products buying is on a more conservative scale. Light rails now are quoted by all makers at 1.75c., base, which represents a slight advance on the part of one maker, but prices on all other lines are the same as they were a week ago.

Instead of showing strength, as might naturally be expected from the scarcity and high cost of coke, the pig iron market actually has taken a turn in the other direction as to basic grade, sales of which lately have been done at $24, Valley Furnace, as against $25 previously quoted. Extremely high prices rule for the very small lots of coal and coke coming upon the market.

Scrap prices are uninfluenced by the lack of consumptive demand, because dealers with short contracts are paying liberal premiums on railroad material in covering them.

Pig Iron.—The price of basic iron has dropped $1 per ton since a week ago, and while there is some question whether additional tonnages can be bought at the same price, the business of the past week has established $24, Valley furnace, as the market price. One lot of 2000 tons sold at this figure and there was also one involving 2500 tons. A recent inquiry for a round tonnage of Bessemer iron, it transpires, was for a Wheeling district steel maker, and the business was

placed with a southern Ohio furnace, the iron to be moved to destination by river. A recent inquiry of the N. & G. Taylor Co., Cumberland, Md., for 6000 tons of basic, is understood to have been placed with a furnace well outside this district, having a more favorable freight rate to destination. Not much activity has been noted in foundry iron, but such business as has been done has been generally at $24, Valley furnace, for No. 2 grade. It is understood, however, that a Valley furnace interest which is getting ready to start up as soon as coke supplies are available, accumulated a back log at $23 for this grade. Some interest is noted in malleable iron and a small sale placed without competition was done at $25, Valley furnace.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.77 per gross ton:

Basic	$24.00
Bessemer	25.00
Gray forge	$23.50 to 24.00
No. 2 foundry	24.00
No. 3 foundry	23.50 to 24.00
Malleable	24.50

Ferroalloys.—Consumers of ferromanganese appear to have covered their probable requirements for the next few months and the market now is very quiet. Domestic producers have had little tonnage for sale for some time and recent activity has obligated English makers against production for the next six or eight weeks. The market consequently is firm with no spot tonnages of either English or American material available at less than $70, Atlantic seaboard. For September and later delivery the English product can be bought at $67.50. Some German 76 to 80 per cent material is offered at $66, Atlantic seaboard. Business in other ferroalloys has been limited and prices are unchanged.

We quote 78 to 82 per cent ferromanganese, $67.50 c.i.f. Atlantic seaboard for domestic; British, spot, $70; British, future, $67.50; German, 76 to 80 per cent, $66. Average 20 per cent spiegeleisen, $36 furnace; 16 to 19 per cent, $35 furnace; 50 per cent ferrosilicon, domestic, $55 to $60 furnace, freight allowed. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, $41.50; 11 per cent, $44.80; 12 per cent, $48.10; 13 per cent, $52.10; 14 per cent, $55.10; silvery iron, 6 per cent, $30; 7 per cent, $31; 8 per cent, $32.50; 9 per cent, $34.50; 10 per cent, $36.50; 11 per cent, $39; 12 per cent, $40.50. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $4.06 per gross ton.

Iron and Steel Bars.—The demand for merchant steel bars still is active and those who insist upon early delivery are finding it increasingly difficult to secure supplies at less than 1.70c. and some makers are exacting 1.80c. for service of this sort. There are occasional suggestions of 1.60c., but these refer to deferred shipments or unfilled contracts of long standing. There is no change in iron bar prices, but as labor costs are rising and demand is increasing, there are suggestions of an early advance.

We quote steel bars rolled from billets at 1.70c. to 1.80c.; reinforcing bars, rolled from billets, 1.70c. to 1.80c. base; reinforcing bars, rolled from old rails, 1.60c.; refined iron bars, 2.20c. in carloads, f.o.b. mill, Pittsburgh.

Semi-Finished Steel.—The market appears to be stiffening again, due to last week's curtailment of production incident to the holiday, and also to the fact that the increased shortage of coke is affecting pig iron production. While non-integrated sheet and tin plate manufacturers balk at paying more than $35, Pittsburgh or Youngstown, for sheet bars, since there has been only a slight advance as compared with the first of the year in sheets, and none at all in tin plate. There are few makers who have any steel to spare and these companies are not interested in business at that price. The Corporation price to regular customers is $33, an advance of $2 over the second quarter price, and by inference the Corporation price on billets and slabs is $32. Independents regard the market on these forms as $35. Forging billets are $40 minimum.

We quote 4 x 4-in. soft Bessemer and open-hearth billets at $35; 2 x 2-in. billets, $35; Bessemer and open-hearth sheet bars, $35; slabs, $35; forging billets, ordinary carbons, $40, all f.o.b. Youngstown or Pittsburgh mills.

Structural Material.—New demands are smaller and less frequent than they were recently since the bulk of contracts lately taken by local fabricators has been of small lots. The mills, however, are pretty heavily committed and few are anxious for additional business. Prices take a wide range when those named on protections are included, these being around 1.50c., but the common prices on current business are from 1.70c. to 1.80c. Prices are given on page 113.

Steel Rails.—There is a pretty steady demand for light rails for prompt shipment and on such business 1.75c. base now is the general quotation. It is possible that this price would be shaded on tonnages for future shipment, but where delivery is specified all makers now are asking 1.75c. base. Thus far the strike of the railroad shopmen has been without effect on other branches of railroad service, and makers of standard rails report normal specifications against existing contracts.

We quote 25 to 45-lb. sections, rolled from new steel, 1.75c. base; rolled from old rails, 1.60c. to 1.65c. base; standard rails, $40 per gross ton mill for Bessemer and open-hearth sections.

Wire Rods.—The market is very firm at $40 for the base size of common soft rods and it is doubtful whether much new business could be placed that low to-day. The leading interest is practically out of the market, while a large independent is refusing business at $40 on the claim that its costs are much above that figure and that it should get $43 base to break even. No business, however, yet has been recorded at above $40.

We quote No. 5 common basic or Bessemer rods to domestic consumers $40, chain rods $40; screw stock rods, $45; rivet and bolt rods and other rods of that character, $40; high carbon rods, $47 to $50, depending on carbon, per gross ton, f.o.b. Pittsburgh or Youngstown.

Wire Products.—Independent makers are enjoying a better business than recently due to the fact that the leading interest is so heavily committed and having so much trouble in catching up with its obligations on account of the fuel situation as to be unable to take more than a small part of the business now offered. Bookings of independents also have been helped by the fact that they have been meeting the Corporation prices. The fact that all producers now have a backlog of orders makes the situation somewhat stronger than it was recently when the distribution of business was less even. Prices are given on page 113.

Cold-Finished Steel Bars and Shafting.—Continued strength of hot-rolled bars as well as the difficulty there is in securing prompt tonnages of a number of sizes, is reflected in a firmer tendency in prices of cold-finished steel bars. Middle Western producers no longer are able to buy hot-rolled bars very cheaply and are trying to establish a base on cold-rolled stock at the equivalent of 2.25c., Pittsburgh. Local makers are inclined to go along with this movement, claiming that the present price, 2.10c., does not allow a reasonable profit. Demand still is good, but supplies appear to be ample except in some of the very small sizes of rounds. Ground shafting is unchanged at 2.50c. base, f.o.b. mill, for carload lots.

Cotton Ties.—The opening price on cotton ties as announced by the Carnegie Steel Co. and subsequently adopted by other makers, is $1.10 per bundle of 45-lb. f.o.b. Pittsburgh, with a monthly carrying charge of 1c. per bundle per month. This price compares with $1.35 per bundle, subsequently cut to $1.30 last year; $2, in 1920 and $1.70 in 1919. Some surprise is expressed that the price should have opened so low this year because $1.10 means that the extra for size over the hoop base has been waived, as has also the cost of the buckle and the lacquering, which usually are considered in establishing the price of ties. At $1.10 per bundle, ties are selling for less than 2½c. per lb. The explanation probably is to be found in the desire of makers to fight off foreign competition. It is interesting to note that there already has been some cutting of the official quotation, one sale of a good-sized lot being noted at $1.07, Pittsburgh. Representatives of German interests still claim that $1.38 per bundle, f.o.b. Hamburg, Antwerp or Liverpool, is about the best foreign price obtainable.

Rivets.—Makers complain that it is increasingly difficult to secure bars and rods promptly except at premium prices and intimate the possibility of a further advance in rivets in the next few weeks. It is claimed current rivet prices were based on rods at $38 and bars at 1.60c., but rods now cannot be bought under $40 and bars command 1.80c. for early shipment. Demand for rivets is good, but so far no particular trouble has been

had in meeting it. Prices and discounts are given on page 113.

Plates.—Inquiry for this product has quieted down considerably, due to the fact that tank builders and most other users are figuring on much less business than they did earlier in the year. Prices hold firm in line with the general market rather than because of a good demand. Prices are given on page 113.

Sheets.—Automobile makers continue to press for delivery of supplies, but activity in other kinds of stock is not as great it was recently, though consumers are specifying fairly well on contracts. The mills are pretty heavily committed and cannot take much additional third quarter tonnage, since full operation is out of the question during the summer months. Practically all mills are taking some business for delivery at their convenience at the Steel Corporation prices, but where early shipment is insisted upon, premiums of $3 to $5 per ton are asked. Prices are given on page 113.

Tin Plate.—Container manufacturers generally have entered orders for their third quarter requirements, but are not much interested at this time in supplies for the last three months of the year. Specifications for August and September shipments are coming along in normal fashion and the independent mills are fairly fully occupied. The Steel Corporation tin plate making subsidiary this week is scheduled for about 75 per cent operation. There is no change in price.

Hot-Rolled Flats.—The market holds firm at 2.50c. base, Pittsburgh, as a minimum of those makers who can take on business for specified delivery. Demand is good, especially from the automotive industry, and on the narrow light gages which most makers are disinclined to take, as high as 2.75c. still is being done.

Cold-Rolled Strips.—New business is not especially heavy, but specifications against contracts are coming in without much prodding on the part of producers. The price remains unchanged at 4c. base, Pittsburgh.

Iron and Steel Pipe.—There has been no appreciable let down in the demand for standard pipe and the obligations of makers continue to climb. Present bookings in steel pipe are sufficient to keep the butt mills fully engaged for about 90 days on the average, and business in lap-welded pipe now before makers is estimated to be equivalent to six to eight weeks capacity operations. There is a better business in oil country goods and in line pipe than there was recently, but less difficulty is experienced in getting reasonably early deliveries on these lines than on standard pipe. The market is extremely firm, but outside of conduit, which has been advanced $4 per ton, there has been no change in prices. The Union Natural Gas Co. has an inquiry out for six miles, or about 500 tons, of 12-in. plain end line pipe to be laid in northern Ohio. Discounts are given on page 113.

Track Equipment.—There is a steady demand for large spikes, but sales are more numerous than large, as the railroads quite generally have covered against their summer requirements. The market is a little slow on small spikes, but all sizes are firm at a minimum of $2.25 base per 100-lb. for large and $2.50 for small and boat and barge spikes. One large maker here is holding to $2 a ton above these prices. Track bolts find a steady sale, with some makers at a minimum of $3.25 base per 100-lb. for carload lots of a size, but with others still quoting $3 on attractive orders. Tie plates have been advanced $5 per ton, now being quoted at $2 to $2.25 per 100-lb. Prices are given on page 113.

Steel Skelp.—Offerings on the open market still are extremely meager notwithstanding a resumption in the Bessemer department by a Youngstown pipe manufacturer who had previously been a buyer of skelp. A well sustained demand for tubular goods makes for a brisk demand for skelp, and prices are very firm at 1.70c. to 1.80c. for either grooved or sheared material.

Bolts and Nuts.—Makers here are doing a comfortable business, but are not being forced and could take on more orders. Third quarter business is not as heavy as that for the previous three months. Prices are firm, but this is due in no small measure to the strength of the general steel market. Discounts are given on page 113.

Coke and Coal.—Prices continue to strengthen despite the activity of the Administration in trying to bring about a settlement of the strike. Efforts to get some of the union mines in this district going have not been at all successful and because of the recent holiday and increased activity on the part of the union organizers, production in the non-union fields has decreased rather heavily. Coal loadings as reported by the railroads in the past week have averaged slightly less than 2000 cars daily, as against close to 2500 cars daily in the two previous weeks. The result has been that the limited amount of nearby coal coming upon the market lately has been bringing $4.25 at mines, the highest point reached since the trouble began. The prevailing market in the South to-day is $4 minimum. Curtailment in the production of beehive oven coke has forced a further advance of about a dollar per ton in price, coke for blast furnace now selling at $9.50 to $10, and for foundry use at $10.

Old Material.—Prices do not change much for the reason that while the consumptive demand is exceedingly light at present, the open market supplies are very limited. Youngstown district melters seem to be out of the market as well as those in this district, but in spite of that fact very high prices were paid on the railroad lists recently issued. A bid of $18.10 per gross ton for the steel in the Pennsylvania Railroad, Central Region, list failed to bring an allotment to a dealer here who made the bid and steel offered in the Pennsylvania Railroad, Eastern Region, list is understood to have sold at around $18.50 per gross ton. These prices are hardly representative of the consumers' market today because the companies here which might take on tonnages of heavy melting steel have set $17.50 as their maximum. High prices for railroad scrap were paid by dealers having contracts to cover. Cast scrap for steel works use is dull and buyers have cut their bids.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows per gross ton:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh	$17.50
No. 1 cast, cupola size	$19.00 to 20.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	17.00 to 17.50
Compressed sheet steel	15.50 to 16.00
Bundled sheets, sides and ends	14.50 to 15.00
Railroad knuckles and couplers	18.50 to 19.00
Railroad coil and leaf springs	18.50 to 19.00
Low phosphorus standard bloom and billet ends	20.00 to 21.00
Low phosphorus plates and other grades	19.00 to 20.00
Railroad malleable	16.50 to 17.00
Iron car axles	26.00 to 27.00
Locomotive axles, steel	24.00 to 25.00
Steel car axles	17.50 to 18.00
Cast iron wheels	18.50 to 19.00
Rolled steel wheels	18.50 to 19.00
Machine shop turnings	14.00 to 14.50
Sheet bar crop ends	18.50 to 19.00
Heavy steel axle turnings	15.50 to 16.00
Short shoveling turnings	15.00 to 15.50
Heavy breakable cast	18.00 to 18.50
Stove plate	15.00 to 15.50
Cast iron borings	16.00 to 16.50
No. 1 railroad wrought	15.00 to 15.50

American Electrochemical Society's New Headquarters

The American Electrochemical Society announces the removal of its national headquarters to Columbia University, New York, after having been located for nearly 20 years at Lehigh University, Bethlehem, Pa. This change is due to the fact that the society's new secretary, Dr. Colin G. Fink, who succeeded the late Dr. Joseph W. Richards, has recently been appointed lecturer in electrochemistry at Columbia, and he will have charge of that division of the university's department of chemical engineering.

By recent action of the society, the adoption of an amendment to the constitution raises the annual dues from $5 to $8. By action of the directors, the organization of a division of organic electrochemistry has been authorized with A. W. Burwell as temporary chairman.

Chicago

Optimistic Feeling as to Coal Strike—Rushing Pig Iron Shipments

CHICAGO, July 11.—There is a growing feeling in this district that the settlement of the coal strike is near at hand. The operators and miners seem to be in a more receptive mood to the efforts of the Government at Washington to bring them together, and while no safe prediction can be made at this time, the outlook is regarded as more favorable than it has been since the inception of the strike. It is regarded as significant that the railroads are corralling a maximum of open top cars on their own lines with the evident purpose of holding themselves in readiness for the coal movement which will be released when the mines resume operation.

The outbreaks of violence which attended the first week of the railroad shopmen's strike are expected to precipitate armed interference by the State and Federal Governments. Such action will be welcomed because it is felt that the exercise of a firm policy by governmental authorities will soon break the morale of the strikers.

Local mill operations remain unchanged notwithstanding the threat of fuel shortage, the uncertainties introduced by the rail strike, and a scarcity of labor. The Illinois Steel Co. is producing at 85 per cent of ingot capacity while the Inland Steel Co. is on a 65 per cent basis. The latter will soon have a third blast furnace ready to go in, but it is probable that actual blowing in will be deferred until the source of fuel supply becomes less uncertain.

Mills are booked from three months to six months ahead and are finding it difficult to make the deliveries desired by consumers. Some users, in fact, are unable to operate their manufacturing plants to capacity because of a shortage of steel. As a consequence, an increasing tonnage of steel is being placed with Eastern mills for early shipment.

Both railroad and car builders continue to make heavy purchases of steel. A Western line has placed an order for 12,000 tons of rails, its second purchase this year, and track fastenings, wheels and axles are being bought liberally. A single order for 4000 axles stands out among recent bookings of local mills. One result of the shopmen's strike has been the appearance of numerous inquiries by Western lines for heavy car repairs which would otherwise have been taken care of by their own forces.

Ferroalloys.—Consumers of ferromanganese seem to have satisfied their requirements to a large extent, with the result that the market is quiet. Two carload inquiries for spot shipment appear to constitute all the new business in the market. For September shipment, more material is available at $67.50, seaboard, than appeared to be the case a week ago. A recent sale for prompt shipment brought out a price of $72, seaboard. Two recent carload sales of spiegeliesen were closed at $46, delivered.

We quote 78 to 82 per cent ferromanganese, future, $75.06; prompt, $79.56, delivered; 50 per cent ferrosilicon, $55 to $62.50, delivered; spiegeleisen, 18 to 22 per cent, $46, delivered.

Pig Iron.—There are few inquiries for forward shipment, although demand for spot iron is fairly active and melters are asking furnaces to rush forward tonnage against contracts. It would appear that melters are adopting a cautious policy, preferring to operate on a close basis rather than to cover their pig iron requirements very far ahead. This seems to be further evidence that shipments up to date have been going directly into consumption, for the most part, and points to the release of even heavier buying when current strike uncertainties are removed and melters no longer need to hesitate to protect their future requirements. The price situation remains unchanged so far as local iron is concerned, but the Southern product seems slightly weaker. Southern iron can still be bought at $18, Birmingham, and a number of furnaces which were quoting $20 have taken business at $19.50 and even as low as $19. Melters serving the automobile business are very busy. One local broker reports recent sales involving 1100 tons of Northern foundry to western Michigan consumers in that category. A local railroad equipment maker has closed for 2000 tons of high manganese foundry with a Milwaukee furnace. One of the most encouraging features of the market is the improved position of the farm implement makers. After a long period of dull business, these manufacturers are resuming production and are now buying iron for last half and fourth quarter.

Quotations on Northern foundry, high phosphorus malleable and basic irons are f.o.b. local furnace and do not include a switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards, or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$31.65
Northern coke, No. 1, sil. 2.25 to 2.75	$24.50 to 25.50
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	24.00 to 25.00
Northern high phos	24.00 to 25.00
Southern No. 2	24.00 to 26.00
Malleable, not over 2.25 sil	24.00 to 25.00
Basic	24.00 to 25.00
Low phos. Valley furnace, sil. 1 to 2 per cent copper free	34.00 to 35.00
Silvery, sil. 8 per cent	37.29

Bars.—The automobile industry, which has been a heavy consumer of bars during the past quarter, is expected to slow down during the late summer and early fall in accordance with past precedents. In fact, automobile sales are already reported as declining, although present commitments will keep the plants busy for a month or two. An easing off in the consumption of soft steel bars would not be unwelcome to the mills, as they have been utterly unable to keep pace with the demand. On the other hand, the mills expect to encounter a steadily increasing demand from the farm implement manufacturers. In fact, the rapidity with which the agricultural machinery makers have disposed of their remaining stocks of finished products has been surprising, but nevertheless convincing of the final recovery of the farming industry after a long period of depression. Implement makers are now buying steel for fourth quarter needs and in some cases their purchases will be liberal. Bar iron demand is active and prices are stronger, ranging from 1.80c. to 1.85c., Chicago. Hard steel bar prices are unchanged, although one mill is booked through third quarter and has withdrawn from the market. The hard bar mill of the Republic Iron & Steel Co. at Moline will start up Aug. 1.

Mill prices are: Mild steel bars, 1.75c. to 1.85c., Chicago; common bar iron, 1.80c. to 1.85c., Chicago; rail carbon, 1.70c., mill or Chicago.

Jobbers quote 2.48c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.40c. for rounds and 3.90c. for flats, squares and hexagons. Jobbers quote hard and medium deformed steel bars at 2.38c. base. Hoops, 3.48c. Bands, 3.23c.

Bolts and Nuts.—Demand has fallen off because most buyers placed heavy orders and specifications at the old discounts effective until July 1. The new discounts are firm, however. The ruling discounts in this territory are those on page 113, except that they are figured on a Chicago base.

Jobbers quote structural rivets, 3.10c.; boiler rivets, 3.20c.; machine bolts up to ⅞ x 4 in., 50, 10 and 10 per cent off; larger sizes, 50 and 10 off; carriage bolts up to ⅞ x 6 in., 50 and 5 off; larger sizes, 45 off; hot pressed nuts, squares and hexagons, tapped, $3.25 off; blank nuts, $3.50 off; coach or lag screws, gimlet points, square heads, 60 per cent off; quantity extras are unchanged.

Wire Products.—New orders tapered off during the first week in July. This may have been due to the holiday, although ordinarily the summer months form a dull season in the wire trade. While new buying is lighter, requests for shipments against contracts are as insistent as ever, indicating that jobbers and manufacturing users have been unable to accumulate stocks. Mills have been unable to increase their operations and are still behind on deliveries. For mill prices see Finished Iron and Steel, f.o.b. Pittsburgh, page 113.

We quote warehouse prices, f.o.b. Chicago: No. 9 and heavier black annealed wire, $3.10 per 100 lb.; No. 9 and heavier bright basic wire, $3.25 per 100 lb.; common wire nails, $3.25 per 100 lb.; cement coated nails, $2.75 per keg.

Sheets.—Local mills are well sold up for third quarter, the Inland Steel Co. now being out of the market. Eastern mills continue to take business in this territory, largely at the Corporation prices. Demand for galvanized is more insistent than for black and blue annealed.

Mill quotations are 3.15c. to 3.30c. for No. 28 black, 2.40c. to 2.50c. for No. 10 blue annealed and 4.15c. to 4.30c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote blue annealed, 3.63c.; black, 4.45c.; galvanized, 5.45c.

Structural Material.—In the opinion of some observers, building activity has reached its peak and construction work will slacken during the remainder of year. As yet, however, there are no tangible evidences of such a reaction, as structural awards and inquiries are still numerous. Reduced construction would not affect local producers for some time, as one mill now has orders for plain material on the books which will engage its capacity until late in the year, while another local interest will not commit itself beyond third quarter, with the probability, however, that its bookings will lap over into fourth quarter. It is possible, of course, that a settlement of the coal strike might permit of better operations than are now possible and thereby enable the mills to catch up on their commitments.

The mill quotation on plain material is 1.75c. to 1.85c., Chicago. Jobbers quote 2.58c. for plain material out of warehouse.

Cast-Iron Pipe.—The market is stronger, prices ranging from $37.50 to $38.50, Birmingham, for 6-in. and larger. Middleville, Mich., took bids July 7 on 175 tons. The United States Cast Iron Pipe & Foundry Co. will furnish 100 tons for Hammond, Ind..

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $49.70 to $50.70; 6-in. and above, $45.70 to $46.70; class A and gas pipe, $3 extra.

Plates.—One local mill continues to take business for indefinite delivery, while another mill is practically out of the market, inasmuch as it does not wish to commit itself beyond third quarter. As a result, demand considerably exceeds local supply and orders for early delivery are going to Eastern mills. The outlook for plate demand is good, as railroad car purchases are expected to continue. It is estimated that the carriers need 15,000 new cars a month to replace worn out equipment and to take care of the natural growth in traffic. Buying during the first six months of this year was at only a slightly higher rate. The Inland Steel Co. has advanced light plates, No. 8 gage and under, to 2c. base, Chicago, and on heavier gages is quoting 1.80c.

The mill quotation is 1.75c. to 1.85c., Chicago. Jobbers quote 2.58c. for plates out of stock.

Rails and Track Supplies.—A Western road has placed 12,000 tons of rails with a local producer. Mills are receiving a constant stream of orders for bolts, spikes and angle bars. Tie plates have not been so active.

Standard Bessemer and open-hearth rails, $40; light rails rolled from new steel, 1.75c., f.o.b. makers' mills.

Standard railroad spikes, 2.16c. to 2.25c., Pittsburgh; track bolts with square nuts, 3.16c. to 3.25c., Pittsburgh; tie plates, steel and iron, 1.85c., f.o.b. mill; angle bars, 2.40c., f.o.b. mill.

Reinforcing Bars.—The concrete bars for the Kalamazoo, Mich., Vegetable Parchment Co., amounting to 600 tons, will be furnished by Joseph T. Ryerson & Son instead of by the Rochester Bridge Co., as erroneously reported last week. The latter company has the contract for the fabricated steel. Other recent lettings include:

Addition to Davis-Watkins dairy machinery plant, North Chicago, Ill., 100 tons, to Corrugated Bar Co.

Highway work, Hardin County, 100 tons, to Concrete Steel Co.

Reservoir, Cedar Rapids, Iowa, 300 tons, to Paul J. Kalman Co.

Greenwood School, St. Paul, Minn., 225 tons, C. A. P. Turner Co.

Fulton Bag and Cotton Mills factory, Minneapolis, 400 tons, to Paul J. Kalman Co.

Bible Training School, St. Paul, 150 tons, to Minneapolis Steel & Machinery Co.

Ford Motor Co. plant, Iron Mountain, Mich., 150 tons, to Worden-Allen Co.

B. & R. Electric Co. plant, Kansas City, Mo., 130 tons, to Kansas City Bolt & Nut Co.

State Capitol, Santa Fe, N. M., 130 tons, to Truscon Steel Co.

Pending business includes:

Wisconsin General Hospital, Madison, Wis., 250 tons, bids in.

Horm Packing Co. plant, South St. Paul, Minn., 100 tons.

Agricultural College building, University of Illinois, Urbana, 200 tons.

Garrett Biblical Institute building, Evanston, Ill., 200 tons.

Fluorspar.—A local steel company is inquiring for 1000 tons of gravel fluorspar for shipment over the remainder of the year.

Coke.—The Southern by-product plant offering foundry coke here has advanced its price to $10.75, delivered Chicago.

Steel Castings.—The new discounts appear to be holding. Steel foundries are operating at a satisfactory rate, in some cases at as high as 80 per cent of capacity, and have considerable work ahead. It is feared, however, that a continuation of the shopmen's strike for any length of time might cause a halt in railroad car purchases.

Old Material.—The market continues to gather strength and a number of grades have again advanced. While large sales to the leading steel mills have not been made for some time, there is a well diversified demand from other sources. Several thousand tons of heavy melting have been sold to some of the smaller interests at $15.50, $15.75 and $16 per gross ton, delivered. Consumptive buying of rolling mill grades is fairly active and both gray iron and malleable foundries are buying scrap more freely because of the recent advances in pig iron. Cast borings are stronger as the result of purchases by blast furnaces and a number of the specialties, such as steel knuckles and couplers, coil springs, drop forge flashings, compressed sheet and axle turnings, have advanced. Dealers are reluctant to sell and at the same time are adding to their yard stock in the belief that the market will go still higher. The inflow of country scrap, which was expected to increase materially following the reduction in freight rates, is as yet disappointingly small. Railroad offerings include the Soo Line, 1500 tons; the Chicago & Eastern Illinois, 500 tons, and the Pullman Co., 800 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$18.00 to $18.50
Cast iron car wheels	19.50 to 20.00
Relaying rails	22.50 to 27.50
Rolled or forged steel car wheels	18.50 to 19.00
Steel rails, rerolling	16.00 to 16.50
Steel rails, less than 3 ft	17.50 to 18.00
Heavy melting steel	15.00 to 15.50
Frogs, switches and guards cut apart	15.00 to 15.50
Shoveling steel	14.50 to 15.00
Drop forge flashings	10.50 to 11.00
Hydraulic compressed sheet	13.00 to 13.50
Axle turnings	13.00 to 13.50
Per Net Ton	
Iron angles and splice bars	17.00 to 17.50
Steel angle bars	14.75 to 15.25
Iron arch bars and transoms	17.50 to 18.00
Iron car axles	22.50 to 23.00
Steel car axles	15.50 to 16.00
No. 1 busheling	12.00 to 12.50
No. 2 busheling	6.75 to 7.25
Cut forge	13.50 to 14.00
Pipes and flues	10.50 to 11.00
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	13.50 to 14.00
Steel knuckles and couplers	16.00 to 16.50
Coil springs	16.50 to 17.00
No. 1 machinery cast	17.00 to 17.50
No. 1 railroad cast	16.00 to 16.50
Low phos. punchings	15.00 to 15.50
Locomotive tires, smooth	13.00 to 13.50
Machine shop turnings	8.50 to 9.00
Cast borings	11.50 to 12.00
Stove plate	14.50 to 15.00
Grate bars	13.50 to 14.00
Brake shoes	14.00 to 14.50
Railroad malleable	15.50 to 16.00
Agricultural malleable	15.50 to 16.00

Industrial Conference in Colorado

The second annual industrial conference on "Human Relations in Industry," on the Y. M. C. A. Conference Grounds, Estes Park, Col, will be held July 28-30, and the training school for superintendents, foremen, supervisors, employment managers, welfare directors and others, will be held July 24-28, at the same place. Among the addresses to be delivered are the following:

Fellowship in Industry, Clarence H. Howard, president Commonwealth Steel Co., St. Louis.

The Public and Industrial Relations, Hon. B. B. Brooks, Casper, Wyo.

Progress in Recent Years on Human Relations in Industry, E. H. Weitzel, general manager Colorado Fuel & Iron Co., Pueblo.

The Progress of Christian Ideals in Industry, David G. Latshaw, D.D., New York.

New York

Plate Inquiry Heavy—Buying Awaits Coal Strike Settlement

NEW YORK, July 11.

Pig Iron.—The only transaction of any importance reported is the purchase of 2500 tons of high silicon iron for July-August delivery by an electric company. No details as to prices are available, but it is thought that the iron will come from Buffalo where the minimum price is $24, furnace, for No. 2 plain. In the Buffalo district, a steel company which has been furnishing merchant furnaces coke has notified them that it will need its coke for its own furnaces and it is feared that the merchant stacks may have some difficulty in obtaining fuel. Very little iron can now be had at Buffalo at $24 and several interests are asking from $1 to $3 higher. In eastern Pennsylvania, the lowest prices are $25.50 for No. 2 plain, $26.50 for No. 2X and $27.50 for No. 1X. Sales of foreign iron include moderate tonnages of Belgian, French and Scotch. The Belgian iron is very high in silicon, ranging from 5 to 6 per cent, and is sold at $22, seaboard. The French, analysis from 2½ to 3 per cent silicon, is high in phosphorus and low in manganese and has sold at $22.50, seaboard. Owing to the limited demand for any kind of iron and also on account of some reluctance to buy foreign grades, owing to their unusual chemical analysis, sales of the foreign product are limited.

We quote delivered in the New York district as follows, having added to furnace prices $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$29.77 to $30.77
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	28.77 to 29.77
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	27.77 to 28.77
Buffalo, sil. 1.75 to 2.25	28.91 to 29.41
No. 2 Virginia, sil. 1.75 to 2.25	29.44 to 30.44

Ferroalloys.—Demand for ferromanganese, while not brisk, is moderately active and consists almost entirely of small lots averaging about 100 tons. Sales, which are almost entirely made up of British alloy, are for August shipment, although some September shipment has been sold. All British representatives have sold their alloy available for July shipment and have disposed of a large proportion of that available for August shipment, a clause covering a possible duty being included in each contract. Very little is heard of sales of domestic alloy. The spiegeleisen market is quiet, the 17 to 19 per cent alloy being quoted at $35, furnace, and the 20 per cent alloy at $36, furnace, with moderate sales reported. Sales of 50 per cent ferrosilicon are confined to small lots and are fairly numerous at $55 to $62 per ton, delivered. Quotations in general are as follows:

Ferromanganese, domestic, seaboard, per ton	$67.50
Ferromanganese, British, seaboard, per ton	$67.50
Spiegeleisen, 17 to 19 per cent	$35.00
Spiegeleisen, 20 per cent	$36.00
Ferrosilicon, 50 per cent, delivered, per ton	$55.00 to $62.00
Ferrotungsten, per lb. of contained metal	40c. to 50c.
Ferrochromium, 6 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr., delivered	12c. to 14c.
Ferrovanadium, per lb. of contained vanadium	$3.00 to $3.50
Ferrocarbontitanium, 15 to 18 per cent, 1 ton to carloads, per ton	$200.00

Ores

Manganese ore, foreign, per unit, seaboard	25c. to 26c.
Tungsten ore, per unit, in 60 per cent concentrates, nominal	$3.00 up
Chrome ore, basis 48 per cent Cr_2O_3, crude, per unit, Atlantic seaboard	40c. to 45c.
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	40c. to 45c.

Cast-Iron Pipe.—The market is exceedingly strong and deliveries are, if anything, becoming more extended. Both private and municipal buying continues good. Despite the stiffness of prices, buyers, anxious for early delivery, have offered bonuses in some cases. Recent bids requested by the Board of Contract and Supply, Yonkers, N. Y., on 2200 tons of cast-iron pipe resulted in a low bid being submitted by R. D. Wood & Co. The contract has not yet been awarded. Low bids on the July 8 opening by the Department of Water Supply, Gas and Electricity, New York, for about 6500 tons of 8-in., 10-in., 12-in. and 20-in. pipe, were submitted on: Section 1, by John Fox & Co., New York, representing the Donaldson Iron Co., Emaus, Pa.; section 2, the Warren Foundry & Machine Co.; and sections 3 and 4 by the United States Cast Iron Pipe & Foundry Co. Prices ranged from $55 to $57 per ton. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $53.50; 4-in. and 5-in. $58; 3-in., $68.30, with $4 additional for Class A and gas pipe.

Warehouse Business.—The market is quiet, but business thus far this month is apparently about on a par with June activity. Sheet prices continue rather weak, but the tendency on both black and galvanized is believed to be upward rather than downward. Dealers handling tire steel, although still quoting about 2.60c. per lb. base expect that an increase on this item will become necessary shortly, as the prices now rather generally quoted by mills have narrowed down the spread for the warehouse to about $9 per ton. This condition is also true of other prices generally. Brass and copper warehouses report business fairly active and prices firm. We quote prices on page 128.

Finished Iron and Steel.—The New York Central Railroad has distributed orders for several thousand tons of steel, including plates, shapes, bars, axles, tires, wire nails, etc., to several mills, this material representing the road's third quarter requirements on which bids were opened two weeks ago. Standard Oil Co. of New Jersey is in the market for 5000 tons of tank plates. In structural steel a number of large jobs are pending totaling 30,000 tons or more, including the 10,000 tons needed for the New York County Court House, which the George A. Fuller Co., general contractor, will award within a week. Except for these large projects, the local steel market continues rather quiet, but steel company representatives report a backed-up demand, which probably will come into the market as formal inquiries when the coal situation has been settled. Some steel companies are discouraging the placing of business, maintaining that it is not to the advantage either of the seller or the buyer to anticipate very far ahead in view of the coal uncertainty. Prices remain firm, and the minimum on shapes and bars is certainly not below 1.70c., Pittsburgh, where early delivery can be promised. On plates the price situation is not quite so strong, and while 1.70c. is nominally the market it is apparent that on an attractive tonnage a buyer could find quotations of 1.65c., Pittsburgh. Specifications on contracts are coming in freely, contracts having been made chiefly on sheets, tin plate, bolts, nuts and rivets and bar iron.

We quote for mill shipments, New York, as follows: Soft steel bars and structural shapes, 2.04c.; bar iron, 1.94c.; and steel plates, 1.99c. to 2.04c. On export shipments the freight rate from Pittsburgh to New York is 28.5c. per 100 lb., while the domestic rate is 34c.

High Speed Steel.—The market shows improvement, probably reflecting the activity now prevailing in the automotive industries. High carbon tool steel shows even greater improvement than high speed steel. We quote 18 per cent tungsten high speed steel at 75c. per lb., base, with special brands of some companies ranging up to 95c. per lb.

Coke.—The lowest prices named on foundry coke are $10.50 to $10.75, ovens, but foundries are not disposed to pay such high prices and most of them are fairly well covered for their requirements; hence some of the coke offered has gone begging. By-product is selling at $10.50, seaboard, to regular customers, but the supply is limited. The lowest quotation named on furnace coke is $9, ovens.

Old Material.—Although prices continue to stand up as firmly as last week, the market generally is quiet. Bethlehem, Alan Wood and Monessen are buying and the Donner Steel Co., Buffalo, recently bought in this market 3500 tons of heavy melting steel. Steel is more active than cast iron at present, although local foundries in Brooklyn have been buying considerable cast scrap at good prices lately. Prices on wrought iron are not strong. Specification pipe prices are firm,

but it is doubtful if better than $8 to $8.50 per ton can be done. It is reported that a dealer in New York, who recently contracted with South American interests for about 100,000 tons of scrap on the West coast of South America, included in which was a fairly large tonnage of old iron rails of British origin, has a contract with the Bethlehem Steel Co. for about 25,000 tons of this material at a price said to be $14.50 per ton delivered.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard	$9.50 to $10.00
Steel rails, short lengths, or equivalent	11.00 to 11.50
Rerolling rails	11.00 to 11.50
Relaying rails, nominal	27.00 to 28.00
Steel car axles	16.00 to 17.00
Iron car axles	22.00 to 23.00
No. 1 railroad wrought	12.50 to 13.00
Wrought iron track	11.00 to 11.50
Forge fire	8.00 to 8.50
No. 1 yard wrought, long	10.50 to 11.00
Cast borings (clean)	9.00 to 10.00
Machine-shop turnings	9.00 to 10.00
Mixed borings and turnings	9.00 to 10.00
Iron and steel pipe (1 in. diam., not under 2 ft. long)	8.00 to 8.50
Stove plate	10.50 to 11.00
Locomotive grate bars	11.50 to 12.00
Malleable cast (railroad)	10.00 to 10.50
Cast-iron car wheels	13.00 to 13.50

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast	$18.00 to $19.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	16.50 to 17.00
No. 1 heavy cast, not cupola size	13.00 to 13.50
No. 2 cast (radiators, cast boilers, etc.)	12.00 to 12.50

Birmingham

BIRMINGHAM, ALA., July 10.

Pig Iron.—In spite of the known strategical strength of Birmingham pig iron and firm attitude of most makers on a $20 base for third and fourth quarter delivery, the $1.50 spread in iron prices still existed at the close of the second week in July. There was no absolutely open quotation under $19, but business that should ordinarily have been taken on that base was lost to concerns making that price even on 500 tons. The majority of makers hold obstinately to the $20 base, even though very little was done last week, the sales being few and for small tonnages, while it is understood that a maker thought to be selling at $18.50 did a fairly good business. Yard stocks, which made a new low level June 1, made a still lower one July 1. Stocks on furnace yards June 1 and July 1 were as follows: foundry, 30,000 and 28,000 tons; machine cast, 12,000 and 3000 tons; warrants, 2400 and 2600; basic, 15,000 and 10,000; totals, 60,000 and 44,000 tons. Total stocks this time last year were 232,000 tons and on Jan. 1, 1922, were 152,000 tons. The largest individual foundry iron holdings July 1 were 12,000 tons, the next 7000. None others had an appreciable amount. Makers insist that the lull has little bearing on prices to be gotten for the bulk of fourth quarter delivery. Large sales made to St. Louis stove makers at $18.50 and recently reported are understood to have been closed two weeks ago. The leading interest is so pressed for iron for steel making purposes that it can scarcely figure conspicuously in any merchant iron market. Many inquiries for prompt iron are turned down because furnaces cannot supply the grades. Southern iron melt is at highest point ever known, although many jobbing foundries and large machinery makers have not come in for much iron.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	$18.50 to $20.00
Basic	18.50 to 19.00
Charcoal, warm blast	30.00 to 32.00

Finishing Mills.—All Bessemer rolling mill departments, Fairfield tie-plate and structural mills and Ensley blooming and rail mills of the Tennessee company remain on double turn this week with ingot production at 100 per cent. Steel and wire mills are fairly full up in all departments. The Gulf States Steel Co. has resumed at its 20-in. bar mills, for the first time since 1920 and is operating four instead of three open hearths.

Cast Iron Pipe.—Jobbers late in entering the market continue to pay $65 for standard and $60 for extra heavy sanitary pipe on a contract base of $55. Shops have all they can handle and deliveries are not promised under several weeks. The United States Cast Iron Pipe & Foundry Co. booked ten miles of 12-in. pressure pipe for Morgantown, N. C., and is filled at four plants excepting that at North Birmingham where the installation of De Lavaud pipe casting machines nears completion with promise of tests being made around July 15. The Pacific Coast is taking 7000 to 10,000 tons of pressure and sanitary pipe per month via vessel out of Mobile. The movement is continuous. It is to all Pacific ports and thence as far inland as Arizona.

Coal and Coke.—C., B. & Q., Iron Mountain, Rock Island, "Frisco," Illinois Central and other Western railroads continue to take 60,000 to 80,000 tons of Alabama coal per week and mines are on full turn. The base is $2.25 and up, Pratt seam, for spot. Coke is firm at $5.50 to $6. Queen Bee coke made by the Barrett Co. sells several dollars higher than the highest grades of other coke. It has found a market in Europe and regular shipments are going there.

Old Material.—Dealers are making heavy deliveries of scrap on contracts booked last month, some of which were heavy, one being for 7000 tons of No. 1 steel for an Alamaba consumer. One very large consumer of No. 1 steel said he was paying $12. A small consumer, using select material, said he was paying $14. This coincides with prices given the same day by yards.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails	$13.00 to $15.00
No. 1 steel	12.00 to 14.00
No. 1 cast	15.00 to 16.00
Car wheels	14.00 to 15.00
Tramcar wheels	13.00 to 14.00
Stove plate	13.00 to 14.00
Cast iron borings	6.00 to 7.00
Machine shop turnings	4.00 to 5.00

Boston

BOSTON, June 11.

Pig Iron.—An inquiry for 2200 tons, silicon 2.75 to 3.25, and 550 tons higher silicon, July and August shipment, from the General Electric Co., served to break the monotony of an uninteresting week in pig iron. The reported sale of 2000 tons of No. 2X and 400 tons, silicon 3.25 to 3.75, Warwick iron, cannot be confirmed here. The supply of available domestic iron apparently has shrunk further and furnaces, especially eastern Pennsylvania, are inclined to increase differentials on silicons. Spreads of $1 between No. 2 plain and No. 2X are now common, while some furnaces make a difference of $2 between No. 2X and No. 1X. All but 175 tons of the Scotch iron received here two weeks ago remains on dock. The 175 tons previously was sold to a Greater Boston stove maker. Unimportant sales of Scotch and French iron, silicons ranging from 2.25 to 3.50, were made the past week, the largest reported being 250 tons to a heater manufacturer to go to a Canadian subsidiary plant. One broker is dickering with a foundry on 1000 tons foreign iron, but details are withheld.

We quote delivered at common New England points as follows, having added to furnace prices $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75	$29.15 to	$30.65
East. Penn., sil. 1.75 to 2.25	28.65 to	29.65
Buffalo, sil. 2.25 to 2.75		30.41
Buffalo, sil. 1.75 to 2.25		29.91
Alabama, sil. 2.25 to 2.75	28.60 to	30.10
Alabama, sil. 1.75 to 2.25	28.10 to	29.60

Cast-Iron Pipe.—The only business of any size put through in this territory since last reports is 900 tons 16-in. pipe placed by Turners Falls, Mass., with the Warren Foundry & Machine Co. That and other pipe makers are booking occasional carlot business on a basis of $55.70 f.o.b. common Boston freight points, for 6-in. pipe and larger, and $59.70 for 4-in. stock. The aggregate weekly tonnage involved is unimportant, however. Class A and gas pipe take $4 differentials. Because pipe producers are sold ahead to October, most New England municipalities are holding off until fall before replenishing stocks.

Finished Material.—Connecticut, Massachusetts and New Hampshire manufacturing plants were fairly

heavy buyers of bars the past week at 1.70c. to 1.80c. base, Pittsburgh. A Boston concern, shortly to engage in the production of tractors, is covering its bar and sheet requirements, and a fair tonnage of sheets, band and hoop and tool steel, in small lots, has been booked in this territory since July 1. Jobbers, however, are not inclined to buy beyond third quarter requirements. No important structural steel tonnages were placed the past week, but several good-sized jobs are pending. One Massachusetts street railway is buying about $15,000 special trackage, but New England carriers collectively are not factors in the finished material market. A moderate demand for steel forgings is noted.

Warehouse Business.—Local prices on cold-rolled steel have been advanced 20c. per 100 lb. to $3.50 on rounds and $4 on squares, hexagons and flats, while steel bands and hoop steel are 25c. higher, the former at $3.75 and the latter at $4.25. Some warehouses have marked up toe calk steel $1 to $6, but others are maintaining $5 base. Blue annealed sheets are slightly higher, but no change is noted in black or galvanized. The demand for both iron and steel is slowly expanding and considerably in excess of that of a month ago. Bolts and nuts are moderately active. Local stocks are fairly large. Blacksmith supplies are moving quite freely. Small rivets find a good market, but large sizes are inactive.

Jobbers quote: Soft steel bars, $2.60½ per 100 lb. base; flats, $3.25½; concrete bars, $2.75 to $2.88; structural steel, $2.60½ to $2.70½; tire steel, $4 to $4.35; open-hearth spring steel, $4.50 to $6; crucible spring steel, $11.50; steel bands, $3.75; hoop steel, $4.25; cold rolled steel, $3.50 to $4; refined iron, $2.60½; best refined iron, $4.25; Wayne iron, $5.50; Norway iron, $6 to $6.50; plates, $2.70½ to $2.87½; No. 10 blue annealed sheets, $3.75 per 100 lb. base; No. 28 black sheets, $4.90; No. 28 galvanized sheets, $5.90.

Coke.—Both the New England Coal & Coke Co. and the Providence Gas Co. are holding firmly to $13.50, delivered, for contract by-product foundry coke where the local freight does not exceed $3.10, and to $14.50 for spot. Both producers are still out of the market for contract fuel and report an increase in shipping instructions on contracts placed heretofore. The New England Coal & Coke Co. continues to make free shipments to points outside New England, the price for such coke now being $12 f.o.b. ovens.

Old Material.—A strengthening of heavy melting steel and borings and turnings prices is the outstanding feature of the market. Steel, for shipment to the Pittsburgh district, is easily 50c. a ton higher. Brokers heretofore offering $8.10 for mixed borings and turnings with bushings are now quoting $8.70, and $9.40 to $9.45 for short shoveling borings and turnings, contrasted with $9 heretofore. Machine shop turnings have advanced 50c. a ton in sympathy. A central Massachusetts maker of textile machinery is offered better than $11.84 for 200 tons of fine cast-iron borings, but 50c. to 75c. a ton less is the best brokers will do on smaller tonnages. The advance in prices just about offsets the recent reduction in freight rates, which works out to the advantage of the manufacturer with material to sell. Little actual business was put through the past week, however, largely because of the lack of desired material. New England foundries show almost no interest in the local machinery cast market.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$19.00 to $20.00
No. 2 machinery cast	17.00 to 18.00
Stove plate	14.00 to 14.50
Railroad malleable	15.00 to 15.50
Street car wheels	18.00 to 19.00

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$11.00 to $11.50
No. 1 railroad wrought	11.50 to 12.00
No. 1 yard wrought	10.00 to 10.50
Wrought pipe (1 in. in diam., over 2 ft. long)	8.00 to 8.50
Machine shop turnings	8.50 to 9.00
Cast iron borings, rolling mill	9.50 to 10.00
Cast iron borings, chemical	10.50 to 12.00
Blast furnace borings and turnings	8.50 to 9.40
Forged scrap and bundled skeleton	8.00 to 8.50
Street car axles and shafting	14.50 to 15.00
Rerolling rails	11.00 to 11.50

Cincinnati

Extremely Quiet Pig Iron Market—Southern Selling at $18

CINCINNATI, July 11.

Pig Iron.—The past week was one of the quietest of the year, sales aggregating in the vicinity of 2500 tons. The largest sale reported was of 400 tons of Southern iron, which was booked on an $18, Birmingham, base. Two other sales of 300 tons each were reported and one of 200 tons of malleable to a central Ohio melter on a $24, Ironton, base. There is very little inquiry, the largest being for 1500 tons for third quarter shipment to a northern Indiana melter. A Louisville implement manufacturer is inquiring for 700 tons of Southern foundry for last quarter shipment. Prices are unchanged from most districts. Northern irons are generally quoted at $24, although it is reported that a Lake producer booked 1000 tons of malleable on a $23 furnace base. Southern iron is still available at $18, from furnaces, and also resale material in brokers' hands, but a stiffening tendency is noted and with an increased demand an upward swing is expected to develop. Shipments on contracts are going forward in good shape and hold-up tonnages now moving forword are given as the reason for the dullness of the last two weeks. The Louisville & Nashville and Southern railroads having notified Birmingham iron makers that their rate on pig iron from Birmingham to Cincinnati will be $3.53, this rate is used in our pig iron quotations this week.

Based on freight rates of $3.50 from Birmingham and $2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$21.53
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	22.03
Ohio silvery, 8 per cent	34.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	26.27
Basic Northern	27.27
Malleable	26.27

Finished Material—The past week was a rather quiet one in this territory, although local sales agencies report receipts of specifications on contracts in fairly heavy volume. New business is rather light and is mostly composed of fill-in orders. There is still, however, a good demand for sheets, automobile body sheets continuing as the leader. Prices show no change, and while premiums are being paid for early delivery, buyers are becoming more convinced that they will have to wait for their shipments at the mills' convenience. There are a number of inquiries for bars before the trade, and while 1.70c. is still being quoted, this price applies for what is practically fourth quarter delivery. For early delivery, 1.80c appears to be the ruling price, and we note several sales of 150 tons at this figure. The Big Four took bids on its third quarter steel requirements last week. Included in the inquiry was a third quarter requirement of small bolts amounting to approximately 700,000. Another inquiry calls for 500 tons of plates for third quarter delivery. In the structural field, the new inquiries consisted mostly of less than 100-ton lots and only one award of consequence was reported. There are a number of projects involving small tonnages of reinforcing bars before the trade, which will likely be awarded within the next two weeks. The demand for wire nails and wire fence has fallen off considerably, although manufactured wire is in fair demand. Some mills are turning down business, owing to interference with their operations as a result of a lack of coal.

Warehouse Business—Local jobbers report their sales continuing in good volume, and the size of the orders is gradually increasing as mill deliveries fall further behind. Prices are very firm but unchanged.

Jobbers quote: Iron and steel bars, 2.75c. base; hoops, 3.60c.; bands, 3.35c. base; shapes and plates, 2.85c. base; reinforcing bars, 2.82½c base; cold-rolled rounds, 3.35c. base; flats, squares and hexagons, 3.85c. base; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, 4.50c.; No. 28 galvanized sheets, 5.50c.; No. 9 annealed wire, $2.70 per 100 lb.; common wire nails, $2.85 per keg, base.

Coke.—The coke market was rather quiet, though furnace coke is still in demand with little available. We note a sale of 3000 tons of furnace coke for shipment during July and August at an unnamed price.

Foundry coke is rather quiet, though shipments on contracts are good. No price changes are reported, and last week's quotations continue in effect. Some Southern railroad lines have placed embargoes on other than perishable freight, including coke, and in some instances coal, as a result of the shopmen's strike.

Old Material.—There is practically no activity in the steel grades, although blast furnace scrap is in good demand for outside points. The local market is inactive. Prices are inclined to be weak, but quotations remain unchanged.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

	Per Gross Ton	
Bundled sheets	$8.00 to	$8.50
Iron rails	13.50 to	14.00
Relaying rails, 50 lb. and up	26.50 to	27.00
Rerolling steel rails	13.50 to	14.00
Heavy melting steel	13.00 to	13.50
Steel rails for melting	13.00 to	13.50
Car wheels	14.50 to	15.00
Per Net Ton		
No. 1 railroad wrought	11.50 to	12.00
Cast borings	9.00 to	9.50
Steel turnings	8.00 to	8.50
Railroad cast	14.00 to	14.50
No. 1 machinery	16.00 to	16.50
Burnt scrap	9.50 to	10.00
Iron axles	18.00 to	18.50
Locomotive tires (smooth inside)	11.00 to	11.50
Pipes and flues	6.50 to	7.00

Buffalo

BUFFALO, July 10.

Pig Iron.—The $24.00 base price is still in existence and while small lots have been sold above that figure, there is no difficulty in obtaining large tonnages at $24. Inquiry is not extraordinarily heavy with any of the furnaces. The largest one engaging attention now is the General Electric inquiry for 3000 tons for delivery in Pittsfield and Lynn, but Buffalo furnaces believe Southern iron will be used in filling this requirement. Sales of No. 2 X at $25 have been frequent. In a total inquiry of 7000 tons to one furnace the largest individual inquiries were for 1500 tons, 1200 tons and 1000 tons. A furnace has sold one car load of No. 2 plain iron at $26, with malleable quoted on the same basis as No. 2 plain. Furnaces not interested in third quarter business are holding off commitments on fourth quarter iron, expecting that $26 will develop shortly and that demand will increase within 30 or 60 days for extended delivery iron. There has been no spurt because of the reduction in freight rates.

We quote f.o.b. per gross ton Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sil.	$25.00
No. 2X foundry, 2.25 to 2.75 sil.	24.50
No. 2 plain, 1.75 to 2.25 sil.	24.00
Basic	24.00
Malleable	24.50
Lake Superior charcoal	31.78

Finished Iron and Steel.—Quotations of 1.80c. on bars, 1.90c. on shapes and 2c. on plates are regarded as ruling prices in the Buffalo market. One interest is quoting 1.75c. to 1.80c. on bars and shapes and the Lackawanna Steel Co. is quoting 1.80c. on bars. But none of the local interests is able to consider bar business in any freer way than heretofore. One agency is taking business in black sheets and getting plenty of it at 3.15c., competitors having advanced to 3.30c. The American Steel & Wire Co. is unable to take any new business and only considers specifications on contracts. The filtration plant inquiry by the City of Buffalo requiring 3500 tons of bars is in the hands of several mills. The ruling price on reinforcing bars is 1.80c. Some attractive plate inquiries are out in certain sizes and there is a brisk demand for cold-rolled material and wire and nails.

Warehouse Business.—Automobile business is said to be supplying 50 per cent of the demand in warehouses. Inquiry is uniform in all lines and there is nothing spectacular in the nature of present business. Demand is better outside of Buffalo. The railroad shop strike has not affected local warehouse business, but is expected to shortly.

We quote warehouse prices, f.o.b. Buffalo, as follows: Structural shapes, 2.65c.; plates, 2.65c.; soft steel bars, 2.55c.; hoops, 3.30c.; bands, 3.15c.; blue annealed sheets, No. 10, 3.55c.; galvanized steel sheets, No. 28, 5.40c.; black sheets, No. 28, 4.40c.; cold-rolled strip steel, 6.05c.; cold-rolled round shafting, 3.35c.

Old Material.—Mills are understood to be paying $16.75 for heavy melting steel, but are not inclined to pay more than that figure and transactions between dealers in the same material are made at $16.50. Cast iron borings are in good demand outside the district and tend to make the price in Buffalo firm. There is no local demand for car wheels, though in Pittsburgh it is reported that $22 has been paid. No big sales in any material are reported.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel	$16.75 to $17.00
Low phos., 0.04 and under	18.00 to 19.00
No. 1 railroad wrought	16.00 to 16.50
Car wheels	17.00 to 18.00
Machine shop turnings	10.50 to 11.00
Cast iron borings	12.50 to 13.00
Heavy axle turnings	14.00 to 14.50
Grate bars	14.00 to 14.50
No. 1 busheling	15.00 to 15.50
Stove plate	15.00 to 15.50
Bundled sheet stampings	11.50 to 12.00
No. 1 machinery cast	18.00 to 18.50
Hydraulic compressed	15.00 to 15.50
Railroad malleable	17.00 to 17.50

St. Louis

ST. LOUIS, July 11.

Pig Iron.—The market for Northern iron advanced during the week to $24.50, Chicago, for third quarter delivery and $25 for prompt shipment. While the market is strong, buyers have not been showing an active interest, except consumers of foundry iron who are seeking iron of silicon of 2.25 and over, of which grades the local maker has none. The tendency of the market seems upward. Consumers who bought enough to take care of what they thought would be their requirements through the third quarter have taken on more business than they had expected, with the result that they again will be in the market for material. The lower freight rates have had the effect of stimulating shipping specifications against contracts. The Granite City maker sold 2000 tons of foundry iron—1500 tons for immediate shipment, and 500 tons for August—to an East Side consumer and 150 tons to a Louisville interest. Other sales were from a carload up to 200 tons. Southern iron is still being quoted at from $18.50 to $20, Birmingham. The lower price is being quoted by a Sheffield maker, but even at the low price very few sales were made during the week. An Indiana melter's request for a price on 1000 to 1500 tons of malleable is the principal inquiry pending. The ferroalloys are quiet.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago and $4.22 from Birmingham and 81 cents average switching charge from Granite City:

Northern foundry, sil. 1.75 to 2.25 (third quar.)	$26.66
Northern malleable, sil. 1.75 to 2.25 (third quar.)	26.56
Basic (third quar.)	26.56
Southern foundry, all rail, sil. 1.75 to 2.25	$22.72 to 24.22
Southern foundry, water and rail, sil. 1.75 to 2.25, f.o.b. St. Louis	22.17

Finished Iron and Steel.—Inquiries from the railroads amounted to very little during the week, a condition that may be due to the railroad strike. One of the Southwestern lines issued instructions that all orders placed for engine and car material be held up indefinitely. The contract for the Government hospital at Jefferson Barracks went to James Stewart & Co., the low bidders named in THE IRON AGE of July 6, the contract involving about 400 tons of reinforcing bars. The plans for the Fort Madison, Iowa, high school have been revived. The contract for the Cornwell National Bank building at Nashville, Tenn., has been let to a local contractor.

For stock out of warehouse we quote: Soft steel bars, 2.57½c. per lb.; iron bars, 2.57½c.; structural shapes, 2.67½c.; tank plates, 2.67½c.; No. 10 blue annealed sheets, 3.72½c.; No. 28 black sheets, cold rolled, one pass, 4.45c.; cold drawn rounds, shafting and screw stock, 3.50c.; structural rivets, $3.19½ per 100 lb.; boiler rivets, $3.29½; tank rivets, 7/16 in. and smaller, 60 per cent off list; machine bolts, large, 50 and 10 per cent; small, 50-10 and 10 per cent; carriage bolts, large, 55-5 per cent; small, 60 and 10 per cent; lag screws, 60 per cent; hot pressed nuts, square or hexagon blank, $3.50; and tapped, $3.25 off list.

Coke.—There is a big demand for coke both for industrial and domestic purposes. Shipments by the

Granite City by-products producer are far in excess of current make, and it is reclaiming a substantial tonnage daily. Sales to the coal trade brought about by the absence of anthracite and bituminous coal due to the strike have been heavy. Connellsville coke is quoted at $9.50, ovens.

Old Material.—The tone of the market for old material continues to improve. The Laclede Steel Co. bought a small lot of re-rolling rails, which will take care of its requirements for the next 90 days. The short interests in melting steel are eager to cover.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton

Old iron rails	$16.75 to $17.25
Steel rails, rerolling	14.75 to 15.25
Steel rails, less than 3 ft.	15.00 to 15.50
Relaying rails, standard section	25.00 to 28.00
Cast iron car wheels	18.25 to 18.75
No. 1 heavy railroad melting steel	14.00 to 14.50
No. 1 heavy shoveling steel	13.00 to 13.50
Ordinary shoveling steel	12.50 to 13.00
Frogs, switches and guards, cut apart	14.50 to 15.00

Per Net Ton

Heavy axle and tire turnings	9.50 to 10.00
Steel angle bars	13.00 to 13.50
Iron car axles	23.00 to 23.50
Steel car axles	17.00 to 17.50
Wrought iron bars and transoms	18.50 to 19.00
No. 1 railroad wrought	12.75 to 13.00
No. 2 railroad wrought	11.75 to 12.25
Railroad springs	15.25 to 15.75
Steel couplers and knuckles	15.25 to 15.75
Cast iron borings	9.00 to 9.50
No. 1 busheling	11.00 to 11.50
No. 1 railroad cast	15.50 to 16.00
Stove plate and light cast	12.75 to 13.25
Railroad malleable	12.50 to 13.00
Pipes and flues	7.75 to 8.25
Machine shop turnings	8.50 to 9.00

Cleveland

Fuel Situation Acute and Number of Blast Furnaces May Be Banked

CLEVELAND, July 11.—The fuel situation has become very acute owing to the inability of the railroads to keep coal moving from the non-union mines of Kentucky and West Virginia because of the shopmen's strike, which prevents locomotive repair work. Several Valley and lake front furnace plants are depending upon fuel from those States for by-product coke plants and have been able to accumulate but little reserve stocks of fuel. Coal shipments have slackened down and the railroads have become badly congested. Among the railroads affected are the Norfolk & Western, Louisville & Nashville and Chesapeake & Ohio. Advices received by telephone late to-day from an investigator sent to the mining districts by a Cleveland steel plant were to the effect that the Chesapeake & Ohio coal shipments have been reduced 50 per cent during the last two or three days. Railroads have advised some of the mines that they will not be able to supply cars for more than a day or two, which will necessitate the shutting down of mines. Unless the situation is relieved shortly a number of blast furnaces will probably have to shut down. M. A. Hanna & Co. are considering blowing out their Cherry Valley furnace, taking advantage of the shut-down to reline the stack.

Iron Ore.—The ore market is dull. Several new inquiries in lots of 25,000 to 50,000 tons have come out and others for lots up to 100,000 tons previously reported are still pending, but no sales are reported during the week. Open market sales so far have been rather light, but a large tonnage has been contracted for by consumers having mining affiliations or long term contracts. Considerable manganiferous ore has been sold and some stocks of this ore have got so low that consumers are calling for early shipments. On July 1 there was 6,753,991 gross tons of ore on Lake Erie docks as compared with 8,417,725 tons on the same date a year ago. June receipts at Lake Erie ports were 4,287,273 tons as compared with 2,774,580 tons during June of last year. Shipments from Lake Erie ports during June were 2,885,027 tons as compared with 2,028,548 tons during June of 1921. Receipts at other than Lake Erie ports during the month were 1,463,979 tons as compared with 848,689 tons during June of last year.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, $5.95; Old range non-Bessemer, 51½ per cent iron, $5.20; Mesabi Bessemer, 55 per cent iron, $5.70; Mesabi non-Bessemer, 51½ per cent iron, $5.05.

Pig Iron.—The market has quieted down considerably and there is more of a disposition among some sellers not to take much additional business until the fuel situation becomes brighter. This has been aggravated by the danger that shipments of coal from West Virginia and Kentucky to Ohio by-product coke plants may be suspended as the result of the railroad shopmen's strike. The coal movement from these States has slowed down considerably in the past day or two because of the inability of railroads to keep their locomotives in repair. There has been a further advance of 50c. per ton in prices on foundry iron by two producers. A Cleveland furnace has advanced its price to $23.50 for outside shipment and a western Pennsylvania foundry has marked its price up from $23.50 to $24. However, $23 is still being quoted by one or more lake furnaces. One producer reports sales aggregating 3000 to 4000 tons during the week, the largest of which was a 1500-ton lot which went to an Indiana melter. A new inquiry has come from a Ft. Wayne, Ind., consumer for 1500 tons of foundry iron and the General Electric Co. is inquiring for 1700 tons of high silicon and high phosphorus iron for its Erie works for July and August shipment. The only new basic inquiry reported came from the Edgewater Steel Co., which asked for 2000 tons for July shipment and it is reported that this order has been placed. A Valley furnace has sold two lots of Bessemer in the Pittsburgh district, one for 500 tons and the other for 100 tons at $25. Competition in low phosphorus iron has resulted in the market settling down to $33 or $1 per ton lower than the maximum that has been quoted recently by a Valley producer. We note the sale of about 1000 tons including a 500-ton lot of low phosphorus iron at $33. Pig iron shipments are holding up well and some producers report that their shipments so far during July have exceeded those of the same period in June. This is evidently partly due to the fact that some consumers held back shipments last month to take advantage of the reduced freight rates. The demand for pig iron from the Michigan automobile industry shows no signs of a let up.

Quotations below are f.o.b. local furnace for Northern foundry iron, not including a 50c. switching charge. Other quotations except basic and low phosphorus are delivered Cleveland, being based on a $3.02 rate from Jackson and a $6 rate from Birmingham:

Basic, Valley furnace	$25.00
Northern No. 2 fdy., sil. 1.75 to 2.25	$23.00 to 24.00
Southern fdy., sil. 1.75 to 2.25	24.50
Ohio silvery, sil. 8 per cent	33.52
Standard low phos., Valley furnace	33.00

Alloy Steel.—Several of the largest automobile companies are specifying for as much alloy steel for their third quarter requirements as they used during the second quarter and mills specializing on this steel is operating at close to 100 per cent capacity. Prices are reported fairly firm at 5c. for chrome vanadium, 4.75c. for chrome vanadium spring steel, 4.75c. for chrome nickel steel and 5.25c. for 3½ per cent nickeled steel.

Semi-Finished Material.—Inquiries are pending for several lots of sheet bars and slabs aggregating 7000 tons. Quotations on sheet bars, billets and slabs are unchanged at $35, Cleveland or Youngstown. We note small lot sales of forging billets at $40, but some mills are asking $42.

Finished Iron and Steel.—New demand for steel is not as active as it has been, indicating a possible summer lull, but consumers are crowding mills for shipments on existing orders. Some manufacturers of automobile forgings and other parts report a slackening in the demand, but so far there is little evidence of a general slowing down in the automotive industry. The market is very firm on steel bars, plates and structural material, with 1.70c. usually the minimum quotation, and some independent mills are asking 1.80c. Hoops and bands are firmer with quotations ranging from 2.50c. to 2.75c., and mills report that they have no trouble in getting the higher price. Inquiry for structural material continues heavy. Two new inquiries

have come from oil companies for 20 stills requiring 600 tons of plates. The Big Four Railroad received bids in Cincinnati late in the week for 1400 tons of tank plates and 300 tons of boiler plates, fire box quality. The minimum quotation on the latter was 1.80c. by Pittsburgh and Chicago district mills. One mill quoted 2c. Locomotive orders are bringing out some plate business.

Reinforcing Bars.—The demand is heavy and deliveries are slower. One mill has advanced its price to 1.80c. for the smaller sizes, but is still quoting 1.70c. for larger sizes. A new inquiry is for 700 tons for the Roosevelt School, Dayton, Ohio.

Sheets.—The demand for automobile body sheets continues heavy with 4.75c. as the ruling quotation by independent mills. Blue annealed sheets in the lighter gages are in heavy demand and a local mill has established a differential on these, quoting No. 12 gage and heavier at 2.55c. and No. 13 gage and lighter at 2.65c. Black sheets are still to be had by independent mills at 3.15c., but some mills are quoting 3.40c. There is a spread of from 4.15c. to 4.40c. on galvanized sheets. A Cleveland mill is quoting light plates at 2.52c. for No. 10 gage.

Warehouse Business.—The demand continues heavy and stocks have become badly depleted. Prices are unchanged.

Jobbers quote steel bars, 2.41c.; plates and structural shapes, 2.51c.; No. 9 galvanized wire, 3c.; No. 9 annealed wire, 2.50c.; No. 28 black sheets, 3.90c. to 4c.; No. 28 galvanized sheets, 4.90c. to 5c.; No. 10 blue annealed sheets, 3.25c. to 3.46c.; hoops and bands, 3.06c.; cold-rolled rounds, 3.20c.; flats, squares and hexagons, 3.70c.

Bolts, Nuts and Rivets.—Bolt and nut specifications continue fairly heavy. The demand is much better for small bolts which are used by automobile and other manufacturers, than for large bolts which are consumed by the railroads. New sales are not numerous, as most consumers are covered with contracts. A few rivet consumers are still placing contracts for the third quarter at the recent advance in prices. Small rivets are quoted at 70 and 10 per cent off list by the leading local manufacturer.

Coke.—There is an increased demand for foundry coke from consumers who laid in a stock before the coal strike but whose supply is now running out. Some sales of Wise County coke are reported at $7 at oven. The price on Connellsville foundry coke has been advanced to $10 and a very limited supply is available.

Old Material.—The market continues dull, but prices are fairly firm. There is very little buying by mills and some are holding up on shipments. Dealers apparently have sufficient scrap to take care of their orders and orders for whatever scrap they have purchased, so that trading between dealers is light. Some dealers are buying miscellaneous scrap for yard stocks. Dealers can get better prices for scrap for Cleveland delivery than for shipments to Valley points. However, the local demand is limited. A Cleveland mill has purchased odd lots of heavy melting steel scrap at $16 to $16.50 delivered. This grade is quoted at $17.50 for Valley delivery with $1.89 freight rate. Borings and turnings are quoted around $14.50 for Valley shipment and $13 to $13.50 delivered Cleveland. For local delivery, dealers are quoting machine shop turnings at $12.75 to $13.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel	$15.25 to $15.50
Steel rails, under 3 ft	15.75 to 16.00
Steel rails, rerolling	16.00 to 16.50
Iron rails	14.00 to 15.00
Iron car axles	18.00 to 19.00
Low phosphorus melting	16.00 to 16.25
Cast borings	12.50 to 12.75
Machine shop turnings	11.50 to 12.00
Mixed borings and short turnings	12.50 to 12.75
Compressed steel	12.85 to 13.25
Railroad wrought	14.00 to 14.50
Railroad malleable	15.50 to 16.00
Light bundled sheet stampings	10.00 to 10.25
Steel axle turnings	13.00 to 13.50
No. 1 cast	17.00 to 17.50
No. 1 busheling	11.25 to 11.75
Drop forge flashings over 10 in	11.00 to 11.50
Drop forge flashings under 10 in	11.25 to 11.75
Railroad grate bars	14.00 to 14.50
Stove plate	14.00 to 14.50
Pipes and flues	11.00 to 11.50

Philadelphia

Strikes an Important Factor—Plates Are Much Stronger

PHILADELPHIA, July 11.

Neither buyers nor sellers appear to be anxious to make important commitments pending the outcome of the negotiations at Washington to end the coal strike. And the unlooked-for seriousness of the railroad strike has injected a new factor into the situation which makes for caution. President Harding's firm stand in the coal situation has won general commendation, though the immediate victory seems to be with the miners rather than with the operators. The proposal that there shall be early resumption of mining pending the solution of the larger difficulties involved is not entirely reassuring, for the fear is that production of coal in increasing quantity may not come soon enough to prevent entirely the further crippling of steel plants and blast furnaces. Some of the steel companies are more seriously concerned over their coal supply than at any time since the strike began. In a few cases, at least, supplies at steel works are sufficient to last out only the month, and unless more coal soon becomes available, partial or complete shutdowns are inevitable in August. Even those companies which have coal bought are not sure of getting all of it because some may be diverted to other purposes, such as public utilities and the railroads.

Rising costs at steel works are also being contended with, steel ingots at some plants costing nearly $2 a ton more than last month. This factor, together with the uncertainty regarding the outcome of the strikes, is adding to the strength of finished steel and pig iron prices notwithstanding the diminished volume of buying. If the coal strike is soon ended, a large demand for coal and coke is expected and the need for cars for coal movement and transportation of the grain crops soon to be harvested is expected to produce a car shortage, especially as the number of bad order cars and locomotives will undoubtedly increase during the shop mechanics' absence from work. Eastern roads are taking steps to anticipate this situation by placing orders for repairs with locomotive and car builders, numerous inquiries for figures on such work now being before the equipment companies.

There is considerable speculation as to what effect, if any, the ending of the coal strike will have upon prices. Some close observers who a month ago expected lower prices on steel and pig iron to follow the end of the strike are not now so sure that such will be the result except, perhaps, to a limited degree.

Ferroalloys.—There is practically no demand for ferromanganese, consumers having recently covered their requirements until August or later. The price of both British and American remains at $67.50, seaboard. Spiegeleisen is quoted at $36, furnace.

Pig Iron.—There is very little demand for iron and no aggressive effort is being made by Eastern furnaces to sell. The market is largely a waiting one, with producers concerned chiefly with their coke supply, while consumers presumably are holding off in the belief that a settlement of the coal strike may have some effect on pig iron prices. The present price situation is very strong, so much so that a furnace with a freight rate of about $3.50 has made sales of No. 2X for shipments to points near Philadelphia at $26.50, furnace, or about $30, delivered. A furnace with a freight rate of $1.64 to Philadelphia is quoting $25.50, furnace, on No. 2 plain and $26.50 for No. 2X, but a furnace with a $1.14 rate quotes $26.50, furnace, for No. 2X, which makes its delivered price at Philadelphia $27.64, which is about as low as this grade of iron can be bought for to-day. Another furnace is asking as high as $28, furnace, for No. 2X. Grades of iron other than foundry are not in demand, and prices are nominal. Some Southern iron is being shipped to a Delaware River cast iron pipe works, and two pipe foundries in Virginia have purchased together more

than 5000 tons of Alabama iron at $18 and $18.50, furnace.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia, and include freight rates varying from 76 cents to $1.64 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$27.14 to $27.76
East. Pa. No. 2X, 2.25 to 2.75	27.64 to 28.76
East. Pa. No. 1X	29.14 to 29.76
Virginia No. 2 plain, 1.75 to 2.25 sil.	29.17 to 30.17
Virginia No. 2X, 2.25 to 2.75 sil.	30.17 to 31.17
Basic delivery eastern Pa.	25.75 to 26.75
Gray forge	25.50 to 26.00
Malleable	27.50 to 28.00
Standard low phos. (f.o.b. furnace)	30.00
Copper bearing low phos. (f.o.b. furnace)	30.00

Semi-Finished Steel.—With demand very light, billets are quoted at the prices which have prevailed for several weeks, $35, Pittsburgh, for rerolling quality, and $40, Pittsburgh, for forging quality.

Plates.—The plate market is very much stronger, due both to rising costs and to a volume of business which is maintaining operations at substantially the same rate as has prevailed for some weeks. For early shipment it is now difficult, if not impossible, to buy below 1.70c., Pittsburgh, while some mills are getting 1.75c. and 1.80c. Pittsburgh. The Pennsylvania Railroad has bought about 5000 tons within the past few days for car repairs and may buy at least that much more. On a part of this tonnage 1.70c., Pittsburgh, was paid, but some of it is reported to have been purchased at 1.60c. or 1.65c. Repairs to cars and locomotives will soon require fairly large tonnages of plates. A local locomotive works is quoting on about 70 new locomotives and on about 65 locomotives for two roads to be repaired. Bids are being asked on the repair of several thousand cars by the Baltimore & Ohio. We quote sheared plates, ¼ in. and heavier, at 1.70c. to 1.80c., Pittsburgh.

Structural Material.—The demand for structural shapes has diminished this month, due largely to the fact that fabricators and jobbers specified fully on their contracts which expired July 1 and in most instances will have enough steel to last through this month. Most of these contracts were made two or three months ago at prices ranging from 1.35c. to 1.50c., Pittsburgh. The present market on plain material is firm at 1.70c., Pittsburgh, with some mills getting 1.75c. and 1.80c.

Bars.—One large producer of steel bars which recently could quote deliveries of two or three weeks is now sold up for three months, and the situation with other bar mills is much the same. Bars are stronger than plates or shapes, and it is becoming more difficult to buy for less than 1.75c. or 1.80c., Pittsburgh, though 1.70c. is the nominal quotation of a few mills. Bar iron is still quoted by Eastern makers at 1.60c., Pittsburgh, but they are asking 1.80c. for less carloads, which is an advance of $2 a ton.

Sheets.—Consumers are specifying freely on their third quarter contracts, but new business in sheets is small. Most of the contract business was taken at 2.40c. for blue annealed, 3.15c. for black and 4.15c. for galvanized, base, Pittsburgh, which makes it difficult for the mills to get prices about $4 or $5 a ton higher, now being quoted on current orders.

Warehouse Business.—Local warehouses have made adjustments in prices to meet the change in freight rates. We now quote for delivery from local warehouses to local consumers as follows:

Soft steel bars and small shapes, 2.55c.; iron bars (except bands), 2.55c.; round edge iron, 2.75c.; round edge steel, iron finish, 1½ x ½ in., 2.75c.; round edge steel planished, 3.50c.; tank steel plates, ¼-in. and heavier, 2.65c.; tank steel plates, 3/16-in., 2.85c.; blue annealed steel sheets, No. 10 gage, 3.40c.; black sheets, No. 28 gage, 4.25c.; galvanized sheets, No. 28 gage, 5.25c.; square twisted and deformed steel bars, 2.65c.; structural shapes, 2.65c.; diamond pattern plates, ¼-in., 4.35c.; 3/16-in., 4.50c.; spring steel, 3.50c.; round cold-rolled steel, 3.20c.; squares and hexagons, cold-rolled steel, 3.70c.; steel hoops, No. 13 gage and lighter, 3.45c.; steel bands, No. 12 gage to 3/16-in., inclusive, 3.20c.; iron bands, 3.90c.; rails, 2.36c.; tool steel, 8c.; Norway iron, 5.50c.; toe calk steel, 4.50c.; tire steel, 2.65c.; planished tire steel, 3.40c.

Coke.—Foundry coke has been sold at as high as $11, Connellsville, which indicates its extreme scarcity.

Old Material.—There is so little demand for scrap that prices are largely nominal. For example, heavy melting steel has been bought within the past week for shipment to Johnstown, Pa., for $15 and $15.50, delivered, which is also the market for eastern Pennsylvania mills, though the latter have a lower freight rate from points of shipment. Blast furnace turnings have been bought for Johnstown at $14.50. There is a wide spread in prices being paid for No. 1 cast. As reported last week, a cast iron pipe foundry bought 500 tons at $17.50, delivered, and more is undoubtedly available at the same price, but for a more selected grade of cast scrap as high as $19.50 is being paid. The difference in price largely has to do with variations in the specifications of buyers. Those which demand selected quality must pay the top price. A rolling mill has bought 250 tons of No. 1 busheling at $12.50, delivered, and a tonnage of pipe at $13. Dealers expect a better demand as soon as the coal strike is settled. We quote for delivery at buyers' works in this district as follows:

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$15.00 to $15.50
Scrap rails	15.00 to 15.50
Steel rails, rerolling	17.00 to 17.50
No. 1 low phos., heavy 0.04 and under	22.00 to 24.00
Cast iron car wheels	17.50 to 18.50
No. 1 railroad wrought	17.00 to 17.50
No. 1 yard wrought	15.00 to 15.50
No. 1 forge fire	13.00 to 13.50
Bundled sheets (for steel works)	13.00 to 13.50
No. 1 busheling	12.50 to 13.00
No. 2 busheling	10.00 to 11.00
Turnings (short shoveling grade for blast furnace use)	13.00 to 13.50
Mixed borings and turnings (for blast furnace use)	13.00 to 13.50
Machine-shop turnings (for steel works use)	13.00 to 13.50
Machine-shop turnings (for rolling mill use)	13.50 to 14.00
Heavy axle turnings (or equivalent)	14.00 to 14.50
Cast borings (for steel works and rolling mills)	14.00 to 14.50
Cast borings (for chemical plants)	16.50 to 17.50
No. 1 cast	17.50 to 19.50
Railroad grate bars	14.50 to 15.00
Stove plate (for steel plant use)	15.00 to 15.50
Railroad malleable	15.00 to 15.50
Wrought iron and soft steel pipes and tubes (new specifications)	13.00 to 13.25
Shafting	20.00 to 20.50

Unemployment Decreasing in Pennsylvania

HARRISBURG, PA., July 10.—Further improvement in iron and steel conditions in Pennsylvania is indicated in the semi-monthly bulletin on unemployment in the State, issued by the commissioner of the State Department of Labor and Industry, Clifford B. Connelley. Twenty-three per cent fewer iron and steel workers were unemployed on July 1 than on June 15, the figures being 25,500 and 33,250 respectively. Those unemployed on July 1, 25,500, were but slightly more than 50 per cent of those unemployed on May 15, when 49,075 were reported out of work.

Unemployment conditions in Pennsylvania generally have been showing much improvement lately. A department statement says that "general unemployment has become a thing of the past, although there are still 124,665 persons in this State unable to obtain work. Most of these are clerks, machinery operatives, professional people, tradesmen, and railroad workers. The railroads are said to be marking time, pending settlement of the shopmen's strike."

As far as conditions in the iron and steel trade are concerned, each of the State's 10 employment districts reported improvement in the half-month ending June 30, the report indicates.

The unemployed in the metal and machinery trades, by districts, on May 15, June 15 and July 1, follow:

	May 15	June 15	July 1
Altoona	975	700	500
Erie	3,800	1,900	1,800
Johnstown	2,000	500	400
McKeesport	1,200	900	700
New Kensington	600	1,000	750
Philadelphia	30,000	20,000	15,000
Harrisburg	1,800	1,400	1,200
Pittsburgh	4,500	3,000	2,000
Scranton	4,000	3,700	3,000
Williamsport	200	150	100
Total	49,075	33,250	25,500

EXPORT TRADE IMPROVES

Japan Buying Rails—Strong Competition from England on Structural Material in Canada —German Competition Weaker

NEW YORK, July 11.—Purchases of rails—light, medium and heavy—are probably the largest item in Japanese transactions at present, although buying of black sheets continues to show improvement. Purchases of sheets, however, are not as large as the number of inquiries in the market would tend to show, for purchases are largely confined to small lots, usually less than a hundred tons, while the inquiries often call for various gages and total up to 400 or 500 tons. One exporter in New York reports receiving an order last week for between 80 and 90 tons of copper bearing sheets of a well known brand. Takata & Co. has booked a small order for switches and similar equipment and 10 miles of 70-lb., 92-lb. and 102-lb. grooved rails from the city of Osaka, Japan. Mitsui & Co. received an order for about a mile of 92-lb. and 102-lb. grooved rails from the Kyoto Electric Railway Co., Kyoto, and the municipality of Tokio is about to close on five miles of 92-lb. grooved rails.

If recent bids received on a small tonnage of 20-lb. T rails asked for by the Imperial Government Railways may be considered as a criterion of future quotations, British mills may again be in a competitive position in the Far East. The order for these rails was placed with Suzuki & Co., which awarded it on a bid, submitted by its London office, of $6 per ton lower than the American quotation, c.i.f. Japan. In business other than rail purchases, the Mitsubishi Shoji Kaisha has booked orders recently for 300 tons of bars and 200 tons of black sheets.

Canada is just now the most active of the export markets for steel, but prices there are lower than in the domestic market owing to keen competition, not only among American mills but with steel offered from England. Skeleton broad flange beams, which are produced under basic patents similar to those held by the Bethlehem Steel Co. on its special sections, are offered from England for delivery in four to six weeks at $2 to $3 per ton lower than Bethlehem sections are quoted in Canada. This differential in favor of English shapes exists mostly on lengths under 30 ft.; on longer lengths the steamship companies charge an extra for transportation.

Plates, shapes and bars are selling in Canada from American mills at prices which figure back to 1.55c. and 1.60c., Pittsburgh, the latter price ruling only on the smaller transactions. Thus the Canadian market is fully $3 per ton under the domestic market. One large buyer there is still getting shipments on a contract made with a Chicago mill, which is equivalent to 1.20c., Pittsburgh, although the Chicago mill gets a higher price because of low transportation costs, the material being shipped via the Great Lakes.

With German prices moving rapidly upward through increased costs of fuel, wages and transportation, fewer complaints are heard of German competition in foreign markets. Although the cotton tie market has opened at $1.10 per bundle, Pittsburgh, a price quite evidently established to forestall the competition in ties received from Germany last year, there is thus far no evidence of any great influx of German ties at this price or lower. In fact, German representatives in this country still contend that at this price or even a considerably higher one, competition is impossible at the present scale of prices prevailing in Germany.

A noteworthy importation of scrap has been made by a dealer in New York, who recently closed with interests in South America for more than 100,000 tons of all kinds of old material including a considerable tonnage of old iron rails and similar equipment, of Engish origin. The material is said to be on the West coast of South America and about 25,000 tons to have been contracted for by the Bethlehem Steel Co. at $14.50 per ton, but delivery has not yet been made.

FRENCH MARKET DULL

Increase in British Pound Aids Pig Iron Exports—Ore Stocks Decline—Automobile Trade Buys Castings

(Special Correspondence)

PARIS, FRANCE, June 28.—Demand, in the French iron and steel market, was not as heavy in June as in May, domestic business being very light. However, orders recently taken will keep the trade busy for two or three months. The rise of British and Belgian currencies and the upward trend of prices in Germany are placing French producers in a position to obtain substantial orders in foreign markets.

Ore.—During the first four months of this year, France exported 2,883,000 tons of iron ore, against 1,997,000 tons during the same period of 1921. Of these, 819,000 tons went to Germany and 492,000 tons to Belgium, instead of 434,000 tons to Germany and 626,000 tons to Belgium during the first four months of 1921. Stocks of French iron ore at the mines decreased from 3,911,000 tons at the end of March to 3,667,000 tons at the end of April.

Present prices of French iron ore, per metric ton at mines, are as follows:

	Fr.	
Minette, Briey	14 to 15	$1.11 to $1.17
Minette, Thionville	10	0.79
Minette, Longwy	10.50	0.83
Hematite, Pyrénées	30	2.37
Carbonate, Normandy	35	2.78

Pig Iron.—The production of pig iron for steel works is not likely to increase at present, as it is fully sufficient to meet the current demand and producers fear a possible coke shortage. Demand for foundry iron is restricted and prices have been reduced by competition among French producers. There is no question of increasing the present output. The maximum consumption of foundry iron, which may be estimated at about 25,000 metric tons per month, can be fully met by the blast-furnaces now in commission.

Current price of chill-cast foundry iron No. 3 P.L. is 215 to 220 fr. ($17.00 to $17.50) at furnace, with as low as 210 fr. ($16.67) possible. Belgian foundry iron is now worth, at furnace, 204 to 209 fr. (French currency) ($16.20 to $16.59), and 5 fr. less f.o.b. Antwerp for export, which is also the export price accepted by Lorraine and Luxemburg producers. British foundry iron No. 3, from Middlesbrough, is quoted at 308 fr. ($24.45) c.i.f. Calais or Rouen, which places it out of competition for the present.

French hematite iron, partly because of the rise of the British pound sterling, which is restricting British exports, now has a better market than it had in May. Transactions in French hematite have been concluded at the following prices: 305 to 315 fr. in the East; 295 to 305 fr. in the Northern and Western coast areas; 325 to 330 fr. in the Center of France and in the Paris area. British East Coast hematite is now worth 316.50 fr. c.i.f. Calais or Rouen, or 321.80 fr. at the Franco-Belgian frontier. British hematite is generally considered of higher grade than French.

Negotiations for the renewal of the Comptoir des Fontes Hématites, which terminates in two months, are now going on.

Semi-Finished Steel.—Semi-finished products are in a satisfactory position, more because of orders already booked than in consequence of new business. Prices of semi-finished products are as follows, per metric ton, f.o.b. works:

	Fr.	
Ingots	290 to 300	$23.03 to $23.82
Blooms	310	24.61
Billets	330	26.20
Flat bars	350	27.79

The above are inland prices for mild (Bessemer) steel. An increase of 20 fr. per ton is charged for open-hearth steel. About the same prices, f.ob. Antwerp, are quoted for export by Lorraine and Saar works. A few sales of French semi-finished products have been made in Great Britain recently as a consequence of the rise of the British pound sterling.

The Comptoir Sidérurgique, which controls inland

sales of beams and rails, sold in May over 40,000 tons of these two products, more than in April, but less than in March.

Sheets.—The market has declined. However, the Comptoir des Tôles, by granting special terms whenever necessary and protection against future price reductions, has skilfully met British and Belgian competition, and its position is now much stronger than it was.

Rolled Merchant Products.—In rolled merchant products, small shapes and round iron for concrete work and nut making are mostly in demand. The current price at works in Lorraine or in the East, is 420 to 430 fr. ($33.35 to $34.14) per metric ton.

Castings.—The castings market is dull, with the exception of malleable iron castings, in demand by the automobile industry.

Scrap.—In the scrap market good machinery scrap is quoted at 200 to 220 fr. and cast-iron scrap at 120 fr. per ton f.o.b. cars, at sellers' works.

The Comptoir des Tubes Soudés par Rapprochement (bureau for the sale and purchase of butt-welded tubes of iron and steel), which existed before the war, has been re-established, and will probably be extended to include lap-welded and seamless tubes (extensively produced in the Saar district).

It is announced that the modifications in the coefficients of import dues on metallurgical products, recently proposed by the Commission of Revision of Customs Dues (reported in THE IRON AGE, July 6), will be shortly ratified by the Government.

The question of the creation of a consortium of banks for financing French exports of metallurgical products is now receiving attention.

The French imports and exports of these products during the first four months of 1922 were as follows:

	Imports Metric Tons	Exports Metric Tons
Pig iron	53,500	145,000
Blooms, billets and bars	134,000	233,000
Sheets	50,000	15,500
Flat billets	6,200	358
Tin plates	15,300	2,100
Steel wire	7,100	7,400
Rails	8,500	47,400

UP-TREND IN GERMAN PRICES

Decline of Mark May Permit Further Increases—Rail Rates Up and Higher Coal Expected—Labor Shortage

(*Special Correspondence*)

BERLIN, GERMANY, June 21.—With the recent depreciation of the mark, the iron and steel trade has been able again to meet foreign competition, and the steel association has decided to increase the price of semi-finished material which had been constant since May. When the members of the association met June 8, they deemed it inadvisable to raise prices, because of lower foreign quotations, but the recent fall in the mark permitted an increase. The price of coal will doubtless go up, as the miners have secured higher wages. Railroad rates are to be increased 25 per cent more on July 1, and it is expected that iron and steel prices will follow if the exchange continues to depreciate.

Until the end of April incoming orders grew less but works were still busy on old contracts. When the conferences in Genoa and Paris showed that they would not lead to an early improvement in the German political and economic situation orders began to come in again more freely.

In all branches of the steel industry, the scarcity of skilled labor is retarding production. The cost of living increased about 10 per cent during May and has since gone still higher, so there is no possibility that the increase in prices will cease. When some German prices reached the world's market level, especially in iron and steel, it was generally predicted that the import of foreign material would soon lead to a reversal of the economic situation, with a lowering of German prices and extensive unemployment. The industry is, at present, still busy and works have orders ahead for several months. A number of companies are building extensions and enlarging their plants. The hardware industry in the Velbert district and the Remscheid and Cronenberger tool and implement factories report that orders, especially for export, show a distinct decrease, but that the works will still be employed for some time.

The base prices as increased on June 20, were given on page 1845, THE IRON AGE of June 29.

The surcharge for open hearth material remains the same, 900 m per metric ton.

Enormous Loss Due to Strikes

The National Industrial Conference Board, in its review of industrial conditions, says:

"Close to 1,250,000 persons are now idle because of strikes in various industries. This represents the number directly affected by voluntary cessations of work and entails a loss of approximately 10,000,000 man hours of work during each day that this situation continues. To visualize the magnitude of this waste, it may be noted that it would require the labor of 100 men working for over 30 years of 300 weekdays each in order to offset the time lost for each week of such idleness. Moreover, this loss applies only to those who have voluntarily quit their employment. With each day that this strike condition exists, more and more persons engaged in secondary or allied industries which are dependent on the major industries are thrown into involuntary unemployment, thereby imposing an additional burden on the community."

Reports of Wage Advance

YOUNGSTOWN, July 10.—Reports of a prospective wage advance persist, but lack authoritative statement. While it is argued that a shortage of labor will force an increase, independents say it is as yet of insufficient proportions to have any effect in this direction. In fact, a number of large employers say they are able to command all the common labor they require, but admit it is more difficult to secure an adequate number of skilled and semi-skilled workers.

Valley independents have never paid common labor less than 30c. per hr., though rates as low as 23c. and 25c. have been paid in competitive districts. Coal miners have secured employment in steel works in the Pittsburgh and Youngstown districts to some extent, and termination of the strike is expected to see an exodus of such men from the mills, returning to the coal fields.

Panama Canal Sells Steel

WASHINGTON, July 11.—The Panama Canal has sold approximately 5500 tons of plates, shapes and bars to the Rosenberg Iron & Metal Co., San Francisco, at $14.55 per net ton f.a.s., Balboa. This material, which is new, constituted a surplus that the Canal had on hand and which was bought on a basis of consumption during the war for the purpose of repairing vessels. The Panama Canal now is asking for informal bids on approximately 1000 tons of billets, tool steel, and a small lot of bars, which is to be disposed of as surplus stock.

The Carnegie Steel Co., Illinois Steel Co. and Tennessee Coal, Iron & Railroad Co. announce the removal of their New York district sales office from the Hudson Terminal Building, 30 Church Street, to the Empire Building, 71 Broadway. Charles C. Cluff is district manager of sales.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Plates

Sheared, tank quality, base, per lb.....1.70c. to 1.80c.

Structural Material

Beams, channels, etc.....1.70c. to 1.80c.

Iron and Steel Bars

Soft steel bars, base, per lb.....1.70c. to 1.80c.
Refined iron bars, base per lb.....2.20c.

Hot-Rolled Flats

Hoops, base, per lb.....2.50c. to 2.75c.
Bands, base, per lb.....2.50c. to 2.75c.
Strips, base, per lb.....2.50c. to 2.75c.
Cotton ties, per bundle of 45 lb.....$1.10

Cold-Finished Steels

Bars and shafting, base, per lb.....2.10c.
Strips, base, per lb.....4.00c.

Wire Products

Nails, base, per keg.....$2.40 to $2.50
Bright plain wire, base, per 100 lb..... 2.25
Annealed fence wire, base, per 100 lb..... 2.25
Galvanized wire, base, per 100 lb..... 2.75
Galvanized barbed, base, per 100 lb..... 3.05 to 3.15
Galvanized staples, base, per keg..... 3.05 to 3.15
Painted barbed wire, base, per 100 lb..... 2.55 to 2.65
Polished staples, base per keg..... 2.55 to 2.65
Cement coated nails, base, per count keg..... 1.90 to 2.00
Woven fence, carloads.....73 per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads,
60, 10 and 10 per cent off list
Machine bolts, small, cut threads....60 and 10 per cent off list
Machine bolts, larger and longer.....60 and 10 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads. 60 and 10 per cent off list
Cut threads .....60 per cent off list
Longer and larger sizes .....60 per cent off list
Lag bolts .....60, 10 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.:
Smaller and shorter .....50 and 10 per cent off list
Larger and longer sizes.....50 and 10 per cent off list
Hot pressed square or hex. blank nuts.....$4.50 off list
Hot pressed nuts, tapped .....$4.50 off list
C.p.c. and t. sq. or hex. nuts, blank.....$4.50 off list
C.p.c. and t. sq. or hex. nuts, tapped.....$4.50 off list
Semi-finished hex. nuts:
9/16 in. and smaller, U. S. S.....80 and10 per cent off list
⅝ in. and larger, U. S. S...75 and 10 and 10 per cent off list
Small sizes, S. A. E.....80, 10 and 10 per cent off list
S. A. E. ⅝ in. and larger...75 and 10 and 10 per cent off list
Stove bolts in packages.....80 and 5 per cent off list
Stove bolts in bulk.....80, 5 and 2½ per cent off list
Tire bolts .....65 per cent off list
Track bolts in carloads.....3.00c. to 3.25c. base
Track bolts, less than 200 kegs.....3.50c. to 3.75c. base

Cap and Set Screws

Milled square and hex. head cap screws,
75 and 10 per cent off list
Milled set screws.....75 per cent off list
Upset cap screws.....80 per cent off list
Upset set screws.....80 and 5 per cent off list

Rivets

Large structural and ship rivets, base per 100 lb.....$2.40
Large boiler rivets, base per 100 lb..... 2.50
Small rivets .....70 and 5 to 70 and 10 per cent off list

Track Equipment

Spikes, 9/16 in. and larger, base, per 100 lb....$2.25 to $2.35
Spikes, ½ in. and smaller, base, per 100 lb..... 2.50 to 2.60
Spikes, boat and barge, base, per 100 lb..... 2.50 to 2.60
Track bolts, base, per 100 lb..... 3.25
Tie plates, per 100 lb..... 2.00 to 2.25
Angle bars, base, per 100 lb..... 2.40

Welded Pipe

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	54½	28	¼ to ⅜	+ 3½	+22½
¼ to ⅜	60	33½	½	36½	18½
½	65	50½	¾	42½	27½
¾	69	56½	1 to 1½	44½	29½
1 to 3	71	58½			

Lap Weld

2	64	51½	2	39½	25½
2½ to 6	68	55½	2½ to 6	42½	29½
7 to 8	65	61½	7 to 12	40½	27½
9 to 12	64	50½			

Butt Weld, extra strong, plain ends

⅛	50½	33	¼ to ⅜	+ 4½	+37½
¼ to ⅜	56	38½	½	35½	23½
½	62	50½	¾	42½	28½
⅝	67	55½	1 to 1½	44½	30½
1 to 1½	69	57½			
2 to 3	70	58½			

Lap Weld, extra strong, plain ends

2	62	50½	2	40½	27½
2½ to 4	66	54½	2½ to 4	43½	31½
4½ to 6	65	53½	4½ to 6	42½	30½
7 to 8	61	47½	7 to 8	35½	23½
9 to 12	55	41½	9 to 12	30½	18½

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 and 2½ per cent.

Boiler Tubes

Lap Welded Steel		*Charcoal Iron*	
1¾ in.	26½	1½ in.	5
2 to 2¼ in.	41	1¾ to 1⅞ in.	15
2½ to 3 in.	52	2 to 2¼ in.	25
3¼ to 13 in.	57	2½ to 3 in.	30
		3¼ to 4½ in.	32

To large buyers of steel tubes a supplementary discount of 5 per cent is allowed.

Standard Commercial Seamless Boiler Tubes

Discounts on cold-drawn or hot-rolled tubes in carload lots, f.o.b. Pittsburgh, follow:

1 in.	60	2½ and 2¾ in.	43
1¼ and 1½ in.	52	3 in.	47
1¾ in.	36	3¼ to 4 in.	52
2 and 2¼ in.	39	4¼ in. to 5 in.	44

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Tin Plate

Standard cokes, per base box.....$4.75

Terne Plate

(Per package, 200-lb.)

8-lb. coating	$9.30	25-lb. coating I. C.	$14.25
8-lb. coating I. C.	9.60	30-lb. coating I. C.	15.25
15-lb. coating I. C.	11.80	35-lb. coating I. C.	16.25
20-lb. coating I. C.	13.00	40-lb. coating I. C.	17.25

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....2.40c. to 2.60c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.15c. to 3.40c.

Galvanized

No. 28 (base), per lb.....4.15c. to 4.40c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.15c. to 3.40c.

Manufacturers have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic.	$0.325	Buffalo	$0.265	St. Louis	0.43
Philadelphia, export	0.265	Cleveland	0.215	Kansas City	$0.735
Baltimore, domestic	0.315	Cleveland, Youngstown		Kansas City (pipe)	0.705
Baltimore, export	0.255	Comb.	0.19	St. Paul	0.595
New York, domestic	0.34	Detroit	0.295	Omaha	0.735
New York, export	0.285	Cincinnati	0.295	Omaha (pipe)	0.705
Boston, domestic	0.365	Indianapolis	0.31	Denver	1.275
Boston, export	0.285	Chicago	0.34	Denver (pipe)	1.215

Pacific Coast	$1.50		
Pac. Coast, ship plates	1.20		
Birmingham	0.69		
Memphis	0.385		
Jacksonville, all rail	0.50		
Jacksonville, rail and water	0.415		
New Orleans	0.515		

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 30c. to 40c.; ship plates, 30c. to 40c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 30c. to 40c.; sheets and tin plates, 50c.; rods, wire rope, cable and strands, 75c.; wire fencing, netting and stretcher, 50c.; pipe, not over 8 in. in diameter, 50c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

NON-FERROUS METALS

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
July	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
5.....	13.87½	13.62½	31.37½	5.75	5.50	5.77½	5.42½
6.....	13.87½	13.62½	31.37½	5.75	5.50	5.82½	5.47½
7.....	13.87½	13.62½	31.37½	5.75	5.50	5.85	5.50
8.....	13.87½	13.62½	.....	5.75	5.50	5.85	5.50
10.....	13.87½	13.62½	31.37½	5.75	5.50	5.85	5.50
11.....	14.00	13.75	31.12½	5.75	5.50	5.87½	5.52½

*Refinery quotation.

New York

NEW YORK, July 11.

Practically all of the markets are quiet, but the price tendency is firm. Prices for copper have advanced but sales are not heavy. The tin and lead markets are exceedingly quiet, but prices are firm. A decided advance has taken place in the zinc market, but sales have been moderate.

Copper.—Since the holiday period last week the market for electrolytic copper has turned stronger, although buying is not active. Moderate sales are reported for all positions through October and prices have advanced about ¼c. since a week ago. Up to within a day or so ago the metal could be bought at a minimum of 13.87½c., delivered, or 13.62½c., refinery, but the minimum is now regarded as general at 14c., delivered, or 13.75c., refinery, which we quote as the market. The strength of the market is partly due to the decline in stocks and the generally favorable statistical position, particularly if the coal strike is soon settled. Sales for export are steady at 14c. to 14.12½c. f.a.s. Lake copper has advanced sympathetically to at least a minimum of 14c., delivered.

Tin.—The stagnant condition which has prevailed for some time in the Straits tin market continues and there has been no revival in buying since the holidays. Sales on July 5 and 6 amounted to about 200 tons, but since then there has been practically no business. There has been a little re-selling by a few consumers, but it is without significance. Yesterday the only sale heard of was five tons of spot Chinese tin. Quotations have been steady for nearly a week with the spot Straits tin quoted to-day at 31.12½c., New York, but almost no business transacted and the quotation largely nominal. Prices in London are substantially unchanged from those prevailing Friday, June 30, and are £153 10s. for spot standard, £154 5s. for future standard and £155 per ton for spot Straits, with the market quiet. Arrivals thus far this month have been 1740 tons, with 5720 tons reported afloat.

Lead.—The market continues quiet with almost no demand outside of heavy specifications on contracts, with consumption large. The two markets, that of the independents and that of the leading interest, are now practically on a parity at 5.75c., New York, or 5.50c., St. Louis, although the asking price of the leading producer is 5.55c., St. Louis. Order books for August have not yet been opened.

Zinc.—The rapid advance in the price of prime Western since the holidays last week has been the feature of the non-ferrous metals. Quotations are now 15 to 20 points higher than a week ago for July and August delivery at 5.52½c., St. Louis, or 5.87½c., New York. The strength of the market is due to several causes, one of the principal ones being the prospect of a termination of the coal strike, which would mean a heavier demand from consumers in the face of rapidly diminishing stocks. The fact that producers are not free sellers also contributes to the strength of the market. Stocks which a year ago amounted to over 90,000 tons had been reduced by the end of May to about 40,000 tons, and the situation at the end of June is reported to have been even more favorable.

Aluminum.—Virgin metal, 98 to 99 per cent pure, in wholesale lots, is quoted by the leading producer at 19.10c. f.o.b. plant, with the same grade of imported metal quoted by dealers at 17.75c. to 18c., duty paid, New York.

Antimony.—Conditions are unchanged, with the market quiet and wholesale lots for early delivery quoted at 5c., New York, duty paid.

Old Metals.—The market continues firm, with a slight improvement in business. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	13.50
Copper, heavy and wire	12.75
Copper, light and bottoms	11.00
Heavy machine composition	10.25
Brass, heavy	8.00
Brass, light	6.50
No. 1 red brass or composition turnings	8.75
No. 1 yellow rod brass turnings	7.50
Lead, heavy	4.875
Lead, tea	3.75
Zinc	3.00

Chicago

JULY 11.—Copper and zinc have advanced and all of the metals are firmer. The market is quiet but there is no pressure to sell and no disposition to make concessions to move material. Old metal prices are unchanged except for advances in red brass and block tin. We quote in carload lots: Lake copper, 14c.; tin, 32.50c.; lead, 5.60c.; spelter, 5.55c.; antimony, 7c., in less than carload lots. On old metals we quote: Copper wire, crucible shapes and copper clips, 10.75c.; copper bottoms, 8.75c.; red brass, 8.50c.; yellow brass, 6.75c.; lead pipe, 4.25c.; zinc, 2.75c.; pewter, No. 1, 20c.; tin foil, 22.50c.; block tin, 26c.; all buying prices for less than carload lots.

St. Louis

July 11.—We quote lead, 5.50c. to 5.60c., carlots; slab zinc, 5.30c. to 5.35c. On old metals we quote: Light brass, 3.50c.; heavy red brass and light copper, 7c.; heavy yellow brass, 4c.; heavy copper and copper wire, 7.50c.; zinc, 2c.; pewter, 15c.; tin foil, 16c.; tea lead 2c.; aluminum 9c.

More Steel Workers Employed

WASHINGTON, July 11.—Employment in the iron and steel industry showed an increase of 4.04 per cent in June over May, according to the monthly industrial survey of the Employment Service, Department of Labor. The total increase in employment in all industries coming within the survey was 179,328, a gain over May of 3.2 per cent. All of the industries, except stone, coal and glass, showed increases. Railroad repair shops showed a gain of 2.5 per cent, while metal products other than iron and steel also showed an increase of 2.5 per cent.

The report estimates that not more than 20,000 employees were furloughed in June, most of this being seasonal. The increase in June is considered remarkable for the reason that it was made despite the unsettled conditions caused by the coal, cotton textile and railroad controversies. Building activities, it is stated, are developing to such an extent that a shortage of skilled building craftsmen is becoming apparent in many sections of the country. The extremely hot weather has hastened wheat cutting in Kansas and Nebraska which, coupled with transportation difficulties, has caused a temporary shortage in the harvest fields of the Middle West.

"The country is steadily but surely forging its way toward a period of industrial prosperity in which it is possible that the labor supply will not equal the demand," says Director General Francis I. Jones, of the Employment Service. "As contrasted with opinion six months ago, a note of optimism pervades practically every industry in every section of the country."

The first installation of the Hawley electric oscillating brass melting furnace is announced as having been made by the Magnus Co., Depew, N. Y.

British Iron and Steel Market

Cleveland Foundry Iron Shipped to United States —Continental Markets Unsettled, Due to Demoralized Money Exchange

(By Cable)

LONDON, ENGLAND, July 11.

Pig iron quietness continues but hopes are still maintained of extended home buying this month. Export inquiry is fair and one lot of 1000 tons of special Cleveland foundry iron has been shipped from Middlesbrough to the United States, while further business is possible.

Hematite stocks are growing and furnaces are cutting prices for export; 92s. ($20.42) has been paid for East Coast mixed numbers.

There is no change in the general aspect in finished iron and steel, though there is perhaps a little more buying going on.

Continental prices are unsettled, owing to the fall in franc exchange. Belgian merchant bars have been sold at £8 5s. (1.54c. per lb.) c.i.f. India; wire rods at £10 7½s. ($46.06) cost and freight to Japan; joists (beams) at £7 5s. (1.44c. per lb.) f.o.b.; wire nails at 20½s. ($4.55) cost and freight to Japan.

Tin plate demand is less active, especially for export, owing to the demoralized foreign exchanges.

Galvanized sheets are very dull.

America is still inquiring for ferromanganese.

Rejections are reported, on the Continent and here, of German material, on the ground of quality. It is suggested that the German works are using inferior raw materials and unsuitable scrap.

We quote per gross ton, except where otherwise stated, f.o.b. maker's works, with American equivalent figured at $4.44 per £1, as follows:

Durham coke, delivered	£1 6½s. to £1 7s.	$5.88 to	$5.99
Cleveland No. 1 foundry	4 15	21.09	
Cleveland No. 3 foundry	4 10	19.98	
Cleveland No. 4 foundry	4 7½	19.42	
Cleveland No. 4 forge	4 5	18.87	
Cleveland basic	4 10	19.98	
East Coast mixed	4 14 & 4 12*	20.87 &	20.42*
Ferromanganese	15 0	66.60	
Ferromanganese*	14 10 to 14 15	64.38 to	65.49
Rails, 60 lb. and up	7 17½ to 9 10	34.96 to	42.18
Billets	7 0 to 8 0	31.08 to	35.52
Sheet and tin plate bars, Welsh	7 7½	32.74	
Tin plates, base box	0 19½ to 0 20	4.33 to	4.44
		C. per Lb.	
Ship plates	9 0 to 10 0	1.78 to	1.98
Boiler plates	13 0 to 14 0	2.58 to	2.77
Tees	9 5 to 10 10	1.83 to	2.08
Channels	8 10 to 9 15	1.68 to	1.93
Beams	8 5 to 10 0	1.64 to	1.98
Round bars, ¾ to 3 in.	9 5 to 10 10	1.83 to	2.08
Galvanized sheets, 24 g.	15 12½ to 15 17½	3.10 to	3.15
Black sheets	12 0	2.38	
Steel hoops	12 0 & 12 5*	2.38 &	2.43*
Cold rolled steel strip, 20 g.	23 2½	4.58	
Cotton ties, Indian specifications	15 0	2.97	

*Export price.

Continental Prices, All F.O.B. Channel Ports, Delivery as Specified

No. 3 foundry pig iron:			
Belgium, July	£4 12½s. to £4 15s.	$20.53 to	$21.09
Luxemburg, July	4 12½ to 4 15	20.53 to	21.09
France, July	4 12½ to 4 15	20.53 to	21.09
Basic pig iron:			
Luxemburg, July	4 6 to 4 7	19.09 to	19.31
Billets:			
Luxemburg, July	6 5	27.75	
Lorraine, July	6 5	27.75	
Wire nails (keg basis)			
Germany, August	0 14½	3.22	
Belgium, July	0 20½	4.55	
Wire rods, 5 mm. (0.2 in.):			
Belgium, July	7 5 to 10 7½	32.19 to	46.06
		C. per Lb.	
Angles:			
Belgium, July	7 10 to 7 12½	1.49 to	1.51
Tees:			
Belgium, July	8 5	1.64	
Merchant bars:			
Belgium, July	7 13½ to 8 5	1.52 to	1.64
Luxemb'g, July, Aug.	8 0	1.59	
Germany, July, Aug.	8 0 to 8 7½	1.59 to	1.66
France, July	8 5 to 8 10	1.64 to	1.68
Channels:			
Belgium, July	7 10 to 7 12½	1.49 to	1.51
Joists (beams):			
France, July, Aug.	7 7½ to 8 0	1.46 to	1.59
Belgium, July, Aug.	7 5 to 7 10	1.44 to	1.49
Luxemburg, July	7 15 to 8 0	1.54 to	1.59
Belgium, July	8 2½	1.61	
⅜-in. plates:			
Germany, July, Aug.	9 5	1.83	
Belgium, July	8 0 to 8 2½	1.59 to	1.61
Luxemburg	8 10	1.68	
⅛-in. plates:			
Germany	9 0	1.78	
No. 8 gage wire:			
Belgium, July, Aug.	14 10	2.87	

Pig Iron and Steel Markets Quiet—Germany Buying British Coal

LONDON, ENGLAND, June 28.—Trade conditions are not particularly cheerful. There are general complaints of the paucity of business, and this is reflected in the lackadaisical aspect of most of the metal markets. The marked improvement which is apparently being experienced in industrial conditions in the United States is regarded with the greatest interest and hopes are naturally entertained that they may be the forerunner of better things here, since in the past the revival has often been perceptible in America before it has become noticeable in other quarters. At the same time eyes are turned with considerable misgiving toward the continent of Europe and it is felt that until things are in a more stable condition there, no improvement in trade conditions can become really permanent. It is sometimes forgotten that the purchasing power of a large portion of the world was enormously reduced by reason of the years of conflict, but it has apparently become recognized that the best has not been done to alleviate the inevitable results of the war on economic and industrial conditions. Possibly the resolution put to the labor congress in Edinburgh to-day is a straw which shows how the wind blows. This blames the present condition of Europe on the mischievous policy of the supreme council.

In the iron trade there are no new features. In pig iron rather more business is coming out but the settlement of the recent labor dispute has not probably resulted in so much improvement as was hoped. Germany has been buying, however, and after the sale of 4000 tons of foundry iron to the United States, it is understood negotiations are proceeding for further quantities. The output of Cleveland iron is being well taken care of, and prices are steady. Some more Cleveland furnaces have been re-lighted. As regards hematite there is a little improvement in inquiry but fairly large stocks still exist and as a consequence prices are on the easy side. Continental competition in pig iron has been apparent again, such offers having been brought out apparently owing to the movement in exchange. So far, however, consumers here do not seem to have given much encouragement to sellers.

The steel market is generally quiet, and it would appear that some makers did not altogether like the 10s. reduction in prices which has been decided upon recently, and some are consequently evading selling at all at these figures. Business for export is quiet, but a few rail orders have been booked both here and on the continent.

It is interesting to note that Germany has been buying British coal.

The Paul J. Kalman Co., Chicago, fabricating interest, has made an initial shipment of reinforcing steel from its new plant on Poland Avenue, Youngstown, Ohio, built to supply its Eastern trade. When in full operation in about six weeks, it will have a capacity for producing 100 tons of reinforcing material daily.

The National Tube Co., Pittsburgh, is arranging for an expenditure of approximately $2,000,000 during the next twelve months for the construction of homes for officials and employees at its new tube mills at Gary, Ind. Plans are nearing completion for erection of an initial unit of more than 200 dwellings.

PERSONAL

George D. McIlvaine, Pittsburgh, who enjoys a wide acquaintance in the steel industry because of his connection with the Association of Tin Plate Manufacturers, of which he is secretary and the National Pipe and Supplies Association, which he serves as secretary-treasurer, lately has been a much honored man. Recently he was elected president of the Lafayette College Alumni Association and a trustee of Lafayette College, from which he was graduated with the class of 1889. At the biennial convention of the Grand Arch Council, Phi Kappa Psi fraternity, in Springfield, Ohio, June 24, last, Mr. McIlvaine was elected president of that organization, which has 17,000 members. He also is president of the American Trade Association Executives and secretary of the Enameled Sanitary Ware Manufacturers' Association.

GEORGE D. McILVAINE

W. K. Kenly and George L. Mayer of W. K. Kenly & Co., Chicago, dissolved partnership July 1, on account of the ill health of the former. W. K. Kenly & Co. was formed last fall for the sale of ferroalloys, finished and raw iron and steel products, iron and steel scrap, new and relaying rails and the distribution in the Chicago district of the products of the Vanadium Corporation of America. Mr. Kenly has gone to Sunmount, Sante Fe, N. M., for an indefinite period, and Mr. Mayer has become associated with Templeton Kenly & Co., Ltd., Chicago, manufacturer of Simplex jacks.

Charles B. Kendall has been appointed purchasing agent of the Hart Mfg. Co., Hartford, Conn., with which he has been associated for the past 17 years.

T. L. Schrantz, formerly manager, supply division, Buffalo office, Westinghouse Electric & Mfg. Co., has been appointed branch manager of the Syracuse office and George W. Roosa has been made acting manager of the supply division, Buffalo office. H. F. Boe has been appointed manager, industrial division, Buffalo office. J. W. Robinson, Chicago office of the company, has been made manager, central station division, to succeed C. E. Allen, who has become St. Louis district manager. H. A. Lynette has been appointed syndicate representative, central station division and Norman Stewart has been made Minneapolis branch manager.

C. C. Clark, who has been affiliated with the Pressed Steel Car Co. for 20 years, has been named as successor to Kenneth C. Gardner, who recently resigned as general sales manager, central district, to become vice-president in charge of sales, Greenville Steel Car Co., Greenville, Pa.

At a meeting of the board of directors of the Consolidated Steel & Iron Corporation, St. Louis, J. R. Finkelstein, president Hoosier Rolling Mill Co., Terre Haute, Ind., was elected president of the Consolidated corporation. The other officers follow: F. J. Stuart, chairman of the board; Hugh Ferguson, first vice president; E. J. Schroeder, vice president and treasurer; M. C. Walsh, secretary.

Edward Sullivan, formerly with the Capewell Horse Nail Co., Hartford, Conn., is now associated with Butts & Ordway Co., Boston, and will be in charge of the company's greater Boston horseshoe supplies business.

Harry G. Stoddard, vice-president and general manager Wyman-Gordon Co., Worcester, Mass., has been made a director of the Associated Motor Industries, a new consolidation of producers of automobile trucks and parts.

Col. Arthur S. Dwight, president, and Charles F. Rand, past president, of the American Institute of Mining and Metallurgical Engineers, have received from the French Government the Croix de Chevalier de la Legion d'Honneur.

Stewart M. Marshall of the consulting engineering firm of Perin & Marshall, New York, returned to the United States on July 5 after an absence of eight or nine months, most of the time in India. F. L. Estep of the firm is scheduled to leave for India by way of England on July 18.

J. L. Cooper has been appointed manager of the Chicago office of the Main Belting Co., Philadelphia, to succeed J. W. Cullen, resigned, to become affiliated with R. E. Ward & Co., Chicago, an advertising agency. Mr. Cooper has been connected with the Main Belting Co. for twenty-five years in Chicago and Philadelphia, and as sales manager of the Buffalo office.

J. G. Benedict, treasurer and general manager Landis Machine Co., Waynesboro, Pa., sailed for Europe on the New Amsterdam July 8. Mr. Benedict plans to visit nearly every country in Europe, returning to America some time in the early autumn.

A. A. Thorsell, for some time connected with the engineering department the Rockford Machine Tool Co., Rockford, Ill., has been promoted to sales manager of that company, with headquarters at Rockford.

F. G. Peterson, for five years managing superintendent of foundries, Bucyrus Co., South Milwaukee, Wis., has resigned to accept the position of general superintendent Hercules Steel Casting Co., Milwaukee, succeeding Frank E. McIntyre, who has returned to the National Brake & Electric Co., Milwaukee. The Hercules company resumed operations July 5 with a normal force after being idle nearly a year.

Frank H. Reynolds, vice-president, general manager and director of the Crawford & McCrimmon Co., Brazil, Ind., has disposed of his holdings in that company and has tendered his resignation. It is understood Mr. Reynolds will take up similar duties with an Eastern company.

L. H. Bloom of the Hart-Parr Co., machinist and founder, Charles City, Iowa, has been promoted to general sales manager to succeed Walter F. Frederickson, resigned to go with another company.

Walter S. Frederickson, until recently general sales manager Hart-Parr Co., Charles City, Iowa, has been appointed sales manager of Auburn Motor Co., Auburn, Ind.

Charles C. Boyden, for a number of years employed by B. Nicoll & Co., New York, and later by the Alan Wood Iron & Steel Co., Philadelphia, has returned to the service of the former company as a pig iron salesman.

Silas H. Horn, formerly with the Brass & Bronze Co., Toledo, Ohio, is chief engineer for the Johnson Bronze Co., at New Castle, Pa.

Joseph M. Harding has been appointed sales manager for the New England Tube & Stamping Co., Inc., at West Haven, Conn.

N. R. Seidle has been made works manager for the General Boilers Co., Waukegan, Ill.

British Pig Iron and Steel Output for June

LONDON, ENGLAND, July 11 (*By Cable*).—The production of pig iron in Great Britain in June was 269,200 gross tons and that of steel ingots and castings 400,200 tons. These compare with 407,900 tons of pig iron and 462,300 tons of steel ingots and castings in May. (The June pig iron production is the lowest for any month this year and steel figures are next to the lowest month this year. The average monthly production of pig iron for the first half of this year is 341,500 tons and of steel ingots and castings 427,100 tons.)

OBITUARY

JOHN M. GOODWIN, general manager New Process Twist Drill Co., Taunton, Mass., died on Tuesday, July 4.

PETER ECKEL, president Eckel-Nye Steel Co., Syracuse, N. Y., died July 7, aged 67 years. Mr. Eckel was born in Syracuse and after attending the public schools became connected with the steel business. In time he was made open-hearth superintendent of the Sweet Mfg. Co., of which the late William A. Sweet was head, and later continued with the reorganized Sweet Steel Co. About 1897, Mr. Eckel and his brothers and Francis H. Nye formed the Eckel-Nye Steel Co., which became one of the successful industries of Syracuse.

SAMUEL GEORGE GOSS, one of the founders of the Goss Printing Press Co., manufacturer of printing presses, Chicago, and president of the organization for many years, died at his home in Glencoe, Ill., June 29.

CHARLES PHILLIPS, superintendent of the Bridgeport Metal Goods Mfg. Co., Bridgeport, Conn., died at his home in that city on July 4 after a brief illness. Mr. Phillips, who was 59 years of age, was at one time connected with the local plant of the Bridgeport Brass Co., resigning to accept the position he held at his death.

CHARLES CROMPTON, son of the founder of the Crompton Loom Works, Worcester, Mass., which eventually became the Crompton & Knowles Loom Works, of which he was vice-president, died June 5, at his home after a long illness, in his fifty-sixth year.

ROBERT BORLAND, senior member of the firm of Borland Brothers, Providence, R. I., machinists, died July 6, at his home.

W. H. HOLLAND, president and general manager, Sibley Machine Co., South Bend, Ind., died on June 14.

FRANK L. MITCHELL, one of the founders of the Mitchell & Lewis Wagon Co., Racine, Wis., which later became the Mitchell-Lewis Motor Car Co., predecessor of the present Mitchell Motors Co., Inc., died at Santa Barbara, Cal., July 3, aged 70 years. He was born in Kenosha, Wis., Dec. 4, 1852. Mr. Mitchell retired from active business in 1912.

PAUL JONES, 84, for many years identified with the iron and steel industry of the Mahoning Valley, died July 8 at Youngstown, Ohio. He served at one time as general manager and subsequently as secretary-treasurer of the William Tod Co., whose plant has since been absorbed by the United Engineering & Foundry Co., Pittsburgh. He was later a vice-president and director of the old Youngstown Steel Co., which has since been absorbed by the Sharon Steel Hoop Co., Sharon, Pa.

W. H. HOLLAND, president and general manager Sibley Machine Co., South Bend, Ind., died June 14.

EDWIN B. ADT, 53 years old, secretary John B. Adt Machinery Co., Baltimore, died June 27. His brother, Albert W. Adt, is president of the machinery company.

CHARLES F. MCGILVRAY, Springfield, Ohio, former president and general manager of the Robbins & Myers Co., died at his home in that city on June 27. He was born in Peterboro, N. H., Jan. 22, 1849, and had resided in Springfield since 1884.

DAVID D. FARIS, manager marine department, Westinghouse Electric & Mfg. Co., Pittsburgh, died suddenly in his office shortly after returning from lunch, July 10. He was born in Wheeling, W. Va., and prior to associating himself with the Westinghouse company in 1904, had been with the Carnegie Steel Co. at Bellaire, Ohio; the National Tube Co. in Pittsburgh; the National Cash Register Co. in Dayton, Ohio, and the Pressed Steel Car Co. in McKee's Rocks, Pa.

COKE REGION VIOLENCE

Increasing Disturbances Due to Strike — More Importation

UNIONTOWN, PA., July 8.—Production of coal for the week ending last Saturday, according to estimates made public the middle of this week, showed an increase of 2,160 tons over the preceding week. This week will probably show a substantial gain over last week, although figures will not be available until the middle of next week.

Union strength in the county has shown no gain, despite intensive efforts on the part of organizers during the week. The first big picnic of the United Mine Workers was held at Shady Grove Park, near Uniontown, to-day and there was a large attendance. Addresses were made by several of the organizers.

Sporadic "sniping" in the way of dynamite explosions with resultant damage to property is growing throughout the county. The Fairchance territory is the most seriously affected thus far, and authorities are exerting every effort to round up the ring leaders. The work is that of organized gangs, according to the officers, who are using automobiles in their raids upon property of working miners. So far there have been no casualties, but property has been damaged and workers have been threatened.

The first of the dynamitings within the city of Uniontown developed during the week when the porch at the home of J. W. Dawson, a prominent lawyer.

The H. C. Frick Coke Co., over the signature of R. S. Skemp, superintendent of Kyle works, is offering $500 for information leading to the arrest and conviction of the dynamiters.

Importation of workers into the region is being continued and places of striking miners are rapidly being filled. Evictions also are continuing, although many strikers are voluntarily moving from company properties. Probably 1000 families have been evicted.

Activities of the union organizers have been directed to maintaining their men in line. Much stress has been laid upon the Washington conferences with the declaration that the strike would soon be settled but would not be settled by the union without the sympathetic strikers in this region being taken care of. The outcome is being watched with interest. Operators in the region here will not recognize the union.

Higher Coal Prices

YOUNGSTOWN, July 10.—Coal prices have appreciably stiffened in the past two weeks. West Virginia and Kentucky coal is firm at $3.50, while some mines are asking $3.75. Prices of coal in the Pittsburgh district show considerable variation, ranging from $4.25 and $4.30 to $4.75. On account of the lower freight charge from the Pittsburgh territory to the Valleys, increased tonnages are moving into the Valleys from that district.

As demand for coal for Northwest consignment strengthens, and diverts supplies that would be otherwise available for industrial uses, it is expected steel companies will enlarge operations at their Pennsylvania mining properties. The Republic Iron & Steel Co., Trumbull Steel Co. and Youngstown Sheet & Tube Co. are obtaining supplies from their mines, but the properties of the Brier Hill Steel Co. are still idle.

Failed to Respond

An attempt on the part of Commissioner C. B. Connelley, Pennsylvania Department of Labor and Industry, to bring about a meeting of Pennsylvania operators of union coal mines and officials of the miners' union at the William Penn Hotel, Pittsburgh, July 6, for the purpose of discussing terms of settling the strike, was not successful. While there was a full attendance of the operators of the bituminous mines, the officials of the miners' union failed to appear.

Machinery Markets and News of the Works

RAILROADS ARE BUYING

Substantial Orders Placed by the Atchison, Topeka & Santa Fe

Illinois Central Expected to Place Orders This Week—New York Central Inquiries Increase

When the coal strike and the railroad shop mechanics' strike are ended, it is expected that the railroads will buy machine tools in generous lots. The Atchison, Topeka & Santa Fe has ignored the shopmen's strike and within the past week has placed orders totaling $75,000 or more. If all of the tools for which this road has inquired in the past few months are purchased, the aggregate will be considerably larger.

The Illinois Central Railroad, which also has inquired for a large list of tools, is expected to begin the placing of orders this week, while in the case of the Chicago, Burlington & Quincy the opinion of the Chicago machine-tool trade is that action will be deferred until a settlement of the railroad strike is in sight.

The New York Central has sent out additional inquiries and the tools for which this road is now definitely in the market total 40 or 50.

The Newport News Shipbuilding & Dry Dock Co., Newport News, Va., will probably place orders within a week for about $100,000 worth of new equipment for extensions to its car department. Included in its requirements are a hydraulic press, hydraulic riveters, two coping machines, a bulldozer and other machines and several overhead electric cranes.

A good many of the orders now being received come from companies engaged in manufacturing automobiles or parts. The Studebaker Corporation is expected to buy additional equipment for its South Bend, Ind., shops, while the Continental Motors Co., Muskegon, Mich., is likewise counted upon as a buyer of more tools.

The General Electric Co. has inquired for seven lathes and six shapers for its Schenectady, N. Y., plant, and a special boring mill for Pittsfield, Mass.

The Jones & Laughlin Steel Co., Pittsburgh, has bought new equipment for a repair shop recently destroyed by fire.

Purchases of tools by the New Castle, Pa., Board of Education total more than 20 items, of which lathes formed the largest part.

Notwithstanding recent price advances, some reductions have been announced. Three makers of upright drills have named new prices about 10 per cent lower.

New York

NEW YORK, July 11.

With many sellers of machine tools June was the best month in a year and a half, sales during that period exceeding those of May, which up to that time had been the best month since the industrial depression began. Prospects for continued improvement appear to be excellent, but the immediate situation is somewhat clouded by the uncertainties engendered by the coal and railroad strikes. The expectation of the trade is that by next fall the machine-tool industry will be well on the road toward a normal volume of business.

Buying is still very much confined to single tools, or at the most two or three machines. Inquiries the past week have not been numerous, but there is a fairly substantial amount of business pending on which quotations have gone out in the past month.

The New York Central Railroad is sending out inquiries every few days for tools and its known requirements now total 40 to 50 machines. Except for a few machines ordered late in June this road has made no purchases.

Bids were closed last week by the Essex County Vocational Schools, Newark, on a list of about 20 machines, and it is expected that orders will be placed this week.

The General Electric Co. has inquired for seven 16-in. lathes and six shapers for its Schenectady, N. Y., plant and for a special boring mill for Pittsfield, Mass.

The Department of Street Cleaning, New York, has inquired for three 12-in. lathes for its repair shops.

The Liberty Machine Tool Co., Hamilton, Ohio, has appointed the McCabe & Sheeran Machinery Corporation, 50 Church Street, its selling agent for the New York territory. The item in the issue of July 6, referring to a sale of two used Liberty frog and switch planers by this company to the Ramapo Iron Works, Hillburn, N. Y., was incorrect in that the planers were not second-hand but new.

Axel Lindstrom, manufacturer from Cape Town, South Africa, is at the Hotel Astor, New York, and is purchasing machinery for his factory. Mr. Lindstrom, in a newspaper interview, said that "not even in England can I find machinery that compares with that of American manufacture. I believe American machinery is so good because your people are always on the lookout for new things and are ready to experiment and adopt innovations."

The Wilson Welder & Metals Co., New York, has received a repeat order from the Cambria Steel Co., Johnstown, Pa., for six plastic arc welding machines.

Following last week's activity in purchases of electric overhead and locomotive cranes, the market has quieted down. However, the present dullness is apparently only temporary in this district, as prospects of good business are reported from other territories. Among the current inquiries in this market is one from the J. G. White Engineering Corporation, 43 Exchange Place, New York, calling for a 60-ton, 4-motor crane with 10-ton auxiliary, for a power house at Pine Grove, Pa. The Boston Elevated Railroad, 108 Massachusetts Avenue, Boston, asked for quotations on a traveling larry, capable of carrying two 10-ton hoppers of crushed coal, bids on which closed July 10.

Among recent purchases are: Long Island Railroad, New York, a 150-ton, 5-motor, locomotive handling crane, and the Southern Pacific Co., a 20-ton, 32-ft. span 3-motor gantry crane from the Whiting Corporation Erie Railroad, for Hornell, N. Y., shops two 15-ton electric cranes from the Champion Engineering Co.; Mount Vernon Car Mfg. Co., Mount Vernon, Ill., a 20-ton, 50-ft. boom locomotive crane equipped with bucket and magnet generator from the Industrial Works; Georgia Marble Co., Tate, Ga., two 1-ton "Liftabout" electric hoists, two 2-ton and one 3-ton electric hoists, two 2-ton and two 1-ton single I-beam cranes from the Shepard Electric Crane & Hoist Co., which has also sold three 10,000 lb. and one 2000 lb. car hauling winches to the Baltimore Car & Foundry Co., Curtis Bay, Md.; Clarence Cottman Co., Canton Terminal, Baltimore, Md., an 11-ton, man trolley ore bridge from Heyl & Patterson, Inc.; American Dyewood Co., Chester, Pa., a 12-ton locomotive crane with bucket from the Orton & Steinbrenner Co.

The Westchester Lighting Co., First Avenue, Mount Vernon, N. Y., will soon take bids for the erection of a two-story shop on East Seventh Street for electric meter repair work, with department for automobile service and repair for company cars. A portion of the building will be used as

a store department. It is estimated to cost about $250,000. William C. Morris, 130 West Fifteenth Street, New York, is architect.

The Anaconda Copper Co., 25 Broadway, New York, has acquired 9 acres at Betts Corner, Akron, Ohio, as a site for a new zinc and lead plant to be owned and operated by its subsidiary organization, the International Lead Co. The plant is estimated to cost close to $1,000,000, including machinery.

Thomsen & Co., 90 Wall Street, New York, commission merchants, are making inquiries for four radial drilling machines, universal type.

S. M. De Pasquale, 2975 Marion Avenue, New York, will soon call for bids for a one-story automobile service and repair works on Webster Avenue, 122 x 170 ft., estimated to cost about $120,000. S. J. Kessler, 529 Cortland Avenue, is architect.

Fire, July 6, destroyed the coal pocket and equipment of the Wyoming Valley Coal Co., 1181 Grand Street, Brooklyn, with loss estimated at about $45,000. Headquarters are at 163 Sixth Street, Brooklyn.

A. H. Grebe & Co., Inc., 10 Van Wyck Avenue, Jamaica, L. I., manufacturer of wireless instruments and equipment, has awarded contract to the Barney Ahlers Construction Co., 110 West Fortieth Street, New York, for a three-story addition, 80 x 100 ft., estimated to cost about $100,000, including equipment.

The B. F. Goodrich Co., 1780 Broadway, New York, with plant at Akron, Ohio, is disposing of a bond issue of $20,000,000, a portion of the proceeds to be used for extensions and improvements. B. G. Work is president.

The Clayton Co., 136 West Fifty-second Street, New York, manufacturer of automobile bodies, has leased the eight-story and basement building at 427-31 West Forty-second Street, 69 x 100 ft., for a new plant.

The Department of Plant and Structures, Municipal Building, New York, G. A. Wahlen, commissioner, has withdrawn bids recently asked for the construction of a machine and repair works for the Department of Street Cleaning, at Sixteenth Street and Avenue C, and will call for new bids at an early date. It will cost in excess of $75,000.

The New York & Queens Electric Light & Power Co., Electric Building, Long Island City, will commence the erection of a new one-story power house, 100 x 120 ft., at Maspeth, L. I., to cost about $50,000.

The Cities Service Co., 60 Wall Street, New York, operating electric light and power companies, is arranging a fund of more than $1,000,000 for extensions and improvements in the power plants and system of the Ohio Public Service Co. The plant of the Toledo Edison Co., a subsidiary, Toledo, Ohio, will be extended for an increased capacity of 30,000 kw.

The Long Island Railroad Co., Pennsylvania Terminal, New York, will commence the immediate construction of a new crane runway at its shops.

The General Electric Co., Schenectady, N. Y., has completed plans for the erection of a new building, to be known as Building No. 99. This will make a total of 311 plant structures on a site of 438 acres.

A new two-story power house, 48 x 68 ft., will be constructed at the New York Homeopathic Medical College and Flower Hospital, Avenue A, Sixty-third to Sixty-fourth streets. Francis T. Joanes, 16 East Fortieth Street, is architcet.

Motors, controlling devices, and other equipment will be installed in the proposed nine-story printing and publishing plant, to be constructed at 147 West Fiftieth Street, by Street & Smith, 79 Fifth Avenue, New York. H. O. Chapman, 334 Fifth Avenue, New York, is architect and engineer.

H. Waterman & Brother, 195 Lewis Street, New York, manufacturer of gas stoves, radiators, etc., have incorporated as Henry Waterman & Brother, Inc., under State Laws, with capital of $250,000, for general expansion.

The Daniels Motor Car Co., Reading, Pa., will establish a complete service and repair works in Brooklyn, to be operated as a factory branch for the Long Island district. Philip Jackson has been appointed manager.

Durant Motors, Inc., 1819 Broadway, New York, is concluding negotiations for the purchase of the plant and business of the Locomobile Co., Bridgeport, Conn., for about $2,000,000. The latter company is now in receivership.

The Mandel-Ehrich Corporation, New York, has acquired the building on East Eighty-eighth Street, near Park Avenue, extending through to East Eighty-ninth Street, for the establishment of an automobile service building, with repair works. Plans are being drawn for three additional stories to the one-story structure.

A vocational department will be installed in the new three-story high school, 270x 277 ft., for which foundations will be laid at once at Cedarhurst, L. I., estimated to cost about $200,000. William Adams, 15 West Thirty-eighth Street, New York, is architect.

The Mexican Petroleum Co., Ltd., 120 Broadway, New York, will make extensions and improvements in its oil terminal and distributing plant at Mata Redonda, Mexico, to cost about $300,000, including equipment.

The Utica Motor Car Co., Genesee Street, Utica, N. Y., will take bids about July 15 for an addition to its service and repair building, estimated to cost about $100,000. Linn Kinne, 113 Mayo Building, is architect.

The Board of Water Commissioners, East Orange, N. J., will take bids until July 20, for the following equipment in connection with extensions to the municipal water system: One watertube steam boiler, 132-hp. capacity; two engine-driven electric generators, each of 120 kva. capacity; one steam turbine driven centrifugal pump, 2,000,000-gal. capacity, complete with condensing equipment; three or more motor-driven centrifugal or reciprocating deep well pumps, each about 1,000,000-gal. capacity; two condensers and vacuum pumps for unaflow steam engines; electric switchboards, transformers annd auxiliary equipment; and electric transmission equipment. Nicholas S. Hill, Jr., and S. F. Ferguson, 112 East Nineteenth Street, New York, are consulting engineers. Roswell M. Roper is secretary.

The Newark Scale Works, 10 Hobson Street, Newark, N. J., has acquired property at 14 Hobson Street, 25 x 100 ft., for the erection of an addition.

Motors, conveying machinery, and other equipment apparatus will be installed in the four-story addition to be erected by the Union Steam Laundry Co., 888 Broad Street, Newark, N. J., in the rear of its present plant, estimated to cost about $100,000, including machinery. William E. Lehman, 738 Broad Street, is architect.

Cressi Brothers, 735 Landis Avenue, Vineland, N. J., will build a new two-story automobile service building, with repair shop, 50 x 170 ft.

Chicago

CHICAGO, July 10.

Railroad buying has commenced, with the prospect of a succession of heavy purchasing during the month. The Santa Fe has closed for part of its list and is still placing orders. Its purchases so far involve an expenditure of about $75,000 and cover some of the heavier tools, including a car wheel lathe, axle lathe, driving wheel lathe, two boring mills, an 18-in. and a 24-in. engine lathe, shaper, a number of drill presses and miscellaneous equipment. The Illinois Central is expected to distribute orders this week, but action on the first of the two Burlington lists has been delayed because the attention of mechanical department officers has been diverted by the shopmen's strike. The Northern Pacific has ordered a No. 2-A Warner & Swasey turret lathe.

Dealers report continued improvement in business with orders coming from diversified sources. The Studebaker Corporation, South Bend, Ind., is expected to buy additional equipment and further orders are looked for from the Continental Motors Co., Muskegon, Mich. Local machine houses are particularly encouraged by the volume of inquiry, although it is still true that in many cases prices on used machines are asked for. Notwithstanding recent advances in a number of standard machines, a few reductions are reported this week. The Royersford Foundry & Machine Co., Inc., Royersford, Pa., has reduced upright drills, emery grinders and foot presses 10 per cent. The Champion Blower & Forge Co., Lancaster, Pa., announces a reduction of 10 per cent on 20-in. upright drills and a similar cut has been made on upright drills by the Silver Mfg. Co., Salem, Ohio.

Although there is considerable pending crane business, there have been few recent orders. The Santa Fe has placed a 240-ton screw jack locomotive hoist with the Whiting Corporation for the Gulf, Colorado & Santa Fe lines. James O. Heyworth, engineer and contractor, Chicago, has ordered a Whiting 40-ton overhead electric traveling crane for a new power plant at Jim's Falls, Wis.

The Battery Parts Corporation, 1408 Cortland Street, Chicago, has been incorporated with $25,000 capital stock to take over the business of the Battery Parts Mfg. Co. It manufactures storage battery separators and is not in the market for additional equipment. The officers are R. H. Starbuck, president, and A. J. Pierson, secretary and treasurer.

The Radio Industries, Inc., 82 West Washington Street, Chicago, recently incorporated, has leased space for the manufacture of metal specialties. It has not yet placed orders for equipment.

J. M. Kryl, president Kryl Bridge & Crane Co., Chicago,

and W. H. Eichelman, until recently chief engineer Hamler Boiler & Tank Co., Chicago, have formed a partnership under the name of Kryl & Eichelman, with headquarters at 2906-2918 West Twenty-sixth Street, Chicago, and will engage in the fabrication of water tanks, oil tanks, stacks, process kettles for chemical equipment, and ornamental and structural iron and steel.

The Western Newspaper Union, 200 North Third Street, Minneapolis, Minn., has taken bids for a two-story printing plant and office building, 46 x 134 ft., at 316 East Avenue, South, to cost $100,000.

The Chicago & Northwestern Railroad has let contract for the construction of a 12-stall engine house at Ashland, Wis.

The Chicago, Burlington & Quincy Railroad has taken bids on a six-stall engine house at Rock Island, Ill.

The Minneapolis, St. Paul & Sault Ste. Marie Railroad will rebuild its 16-stall round house at Gladstone, Mich., recently destroyed by fire.

The Witwer Battery Co., 630 St. Louis Street, Danville, Ill., recently incorporated with $500,000 capital stock, will manufacture automobile and radio semi-dry storage batteries. It has a new two-story plant, 47 x 70 ft., and will build a one-story addition, 52 x 127 ft. It has not yet decided on the equipment it will purchase. The officers are: President, H. T. Witwer; vice-president and treasurer, G. H. Keeley; secretary, F. M. Witwer.

The Duke Nut Lock Co., 69 South Water Street, Chicago, incorporated with $10,000 capital stock, is buying dies and letting out the manufacturing on contract of the Duke nut lock. The officers are: President, George H. Duke; vice-president, George E. Gibson; secretary-treasurer, George H. Duke, Jr.

Cribben & Sexton, manufacturers of stoves, 680 North Sacramento Boulevard, Chicago, have let contract for a one-story factory, 24 x 45 ft., at 716-24 Sacramento Boulevard, to cost $4,000.

The Ryan Car Co., repairer of railroad freight equipment, Hegewisch, Ind., is erecting a one-story extension to its power house, 30 x 60 ft., to cost $6,000.

The Plano Works of the International Harvester Co., West Pullman, Ill., is being repaired and enlarged. The Plano machine shop is being rehabiliated and the foundry building will be used hereafter as the heat-treating department.

O. V. Palmquist & Co., manufacturer of sash, doors and blinds, 4884 North Clark Street, Chicago, has let contract for a one-story factory, 60 x 163 ft. at 5915-23 Ravenswood Avenue, to cost $40,000.

The machine shops of the Denver & Salt Lake Railroad, Denver, Colo., were partially destroyed by fire July 4. The damage is estimated at $60,000, including equipment.

The Atlas Iron Works Corporation, 351-9 West Fifty-ninth Street, Chicago, has been incorporated with $25,000 capital stock to fabricate structural, ornamental and miscellaneous iron work. A plant, 100 x 100 ft., on a site, 100 x 265 ft., has been purchased. The officers are: President, T. F. Husmann; secretary, H. Kitzelman, and treasurer, C. Chapman. The company is in the market for a structural punch and shear and a riveter.

The Chicago Hardware Co., North Chicago, Ill., is taking bids for a one-story addition, 70 x100 ft., to be equipped as an enameling works, estimated to cost close to $45,000. Shankland & Pingrey, 209 South La Salle Street, Chicago, are architects.

The National Enameling & Stamping Co., 411 Fifth Avenue, New York, has plans nearing completion for an addition to its plant at Granite City, Ill., estimated to cost close to $1,000,000, including equipment. George W. Niedringhaus is president.

The Zenith Furnace Co., Duluth, Minn., has arranged for a bond issue of $1,000,000, a portion of the proceeds to be used for extensions and improvements. W. B. Castle is president.

The Buick Motor Co., 2031 Calumet Avenue, Chicago, has filed plans for a two-story service and repair building at 2021-29 Calumet Avenue, estimated to cost about $125,000.

A vocational department will be installed in the two-story and basement senior high school, 77 x 170 ft., to be erected at Alliance, Neb., estimated to cost about $175,000. Fiske & Meginnis, 533 Bankers' Life Building, Lincoln, Neb., are architects.

The Northwest Paper Co., Cloquet, Minn., is considering the installation of a traveling crane.

The Cabirange Mfg. Co., Granite City, Ill., manufacturer of stoves, ranges, etc., is having revised plans prepared for a new one-story plant at Twenty-fourth Street and Avenue A. Charles Pauley & Son, Nineteenth Street, are architects.

A vocational department will be installed in the new one and two-story high school to be erected at Arlington Heights, Ill., estimated to cost about $100,000, for which bids will soon be asked. J. N. Coleman, 6257 St. Lawrence Avenue, Chicago, is architect.

The Common Council, Whitehall, Ill., will soon call for bids for extensions and improvements in the municipal electric power plant, estimated to cost about $75,000. The Caldwell Engineering Co., Ayers Bank Building, Jacksonville, Ill., is engineer.

The Racine Horseshoe Tire Co., Racine, Wis., is disposing of a bond issue of $300,000, a portion of the proceeds to be used for extensions and improvements. J. C. Lawrence is president.

A vocational department will be installed in the two-story and basement junior high school at Grand Rapids, Minn., to be 70 x 180 ft., and estimated to cost about $250,000. Bids for erection are being asked. Holstead & Sullivan, Palladio Building, Duluth, Minn., are architects.

The Atlas Power Co., duPont Building, Wilmington, Del., has plans under way for an addition to its plant near Pinckneyville, Ill., estimated to cost about $100,000, including equipment. It will replace a portion of the works recently destroyed by fire. I. K. O'Brien is engineer in charge.

Philadelphia

PHILADELPHIA, July 10.

Proctor & Schwartz, Inc., Seventh Street and Tabor Road, Philadelphia, manufacturer of drying machinery, has filed plans for the erection of a one-story machine shop, estimated to cost $100,000, including equipment.

The Heintz Mfg. Co., Philadelphia, has taken out a State charter with capital of $300,000, to manufacture heavy metal stampings and other products. Work will begin on two one-story buildings, 73 x 205 ft., and 26 x 36 ft., respectively, at Front and Olney Streets. Leo I. Heintz, 2120 West Tioga Street, is president, and R. P. Farrington, Bala (Montgomery County), treasurer.

The Charles P. Hoffman Co., 215 Cuthbert Street, Philadelphia, operating an electro plating works, has leased two floors in the building at 311 Cherry Street for extensions.

Max Levy & Co., Wayne Avenue and Berkley Street, Philadelphia, manufacturer of equipment and supplies for photoengraving, has plans under way for a new four-story addition, 60 x 100 ft. Louis Levi, Real Estate Trust Building, is architect.

The Horn & Brannen Mfg. Co., 427 North Broad Street, Philadelphia, manufacturer of gas and electric fixtures, has acquired property, 84 x 208 ft., at 1814-16 Spring Garden Street, for about $100,000. The present building will be remodeled and improved and an addition erected in the rear.

Fire, June 30, destroyed a portion of the plant of the Textile Machinery Co., Fourteenth and Esrey streets, Chester, Pa., occupying part of the building, with loss reported in excess of $50,000.

Horace T. Potts & Co., 316 North Third Street, Philadelphia, iron and steel manufacturers and merchants, are laying foundations for a new machine shop and power house. Two warehouses will be built, 75 x 370 ft., and 120 x 192 ft., respectively, to be equipped with electric traveling cranes, from 7½ to 3-tons capacity. The entire plant will represent an investment of about $500,000.

The Pennsylvania Railroad Co., Broad Street Station, Philadelphia, has plans under consideration for new car and locomotive shops, and extensions in present shops in different parts of the State. An appropriation of $3,000,000 has been arranged, it is said, for the expansion.

The Philadelphia Electric Co., Tenth and Chestnut streets, Philadelphia, is clearing the site at 5607 Race Street, preparatory to the erection of a new power house, plans for which have been drown.

The Concrete Steel Co., 42 Broadway, New York, manufacturer of steel and wire products, will commence the erection of a one-story addition to its plant at Seventeenth and Federal streets, Camden, N. J.

The Trenton Electric Supply Co., 207 East State Street, Trenton, has purchased property at 233 East State Street, 21 x 150 ft., for future expansion. Charles F. McCoy is president.

Bids will soon be asked for a one-story power house at the Mark M. Packer Hospital, Purdy and Cataissa streets, Sunbury, Pa. W. H. Rockefeller, 214 Market Square, is architect.

The Williamsport Wire Rope Co., Williamsport, Pa., is disposing of a bond issue of $600,000, a portion of the proceeds to be used for expansion. Joseph W. Cochran is president.

Fire, July 1, destroyed the plant of the Storb Crushed Stone Co., Pine Forge, near Pottstown, Pa., including crush-

ing and other machinery, with loss estimated at about $75,000.

The Board of Education, Dowington, Pa., is arranging a list of equipment for installation in the vocational department at the new high school.

The Pennsylvania Water & Power Co., Holtwood, Pa., has arranged a bond issue of $850,000, a portion of the proceeds to be used for extensions and improvements in power plant and system.

The Pottstown Machine Co., Pottstown, Pa., manufacturer of machinery and parts, has plans under way for enlargements, to cost about $50,000. John R. Saylor heads the company.

A vocational department will be installed in the new three-story and basement high school to be erected at Shippensburg, Pa., estimated to cost about $200,000, for which J. A. Dempwolf, Casset Building, York, Pa., architect, will prepare plans.

The Wilkes-Barre Co., Wilkes-Barre, Pa., operating a local light and power plant, has arranged for a bond issue of $102,900, a portion of the proceeds to be used for extensions and improvements.

The Roberts & Mander Stove Co., Eleventh and Washington streets, Philadelphia, has awarded contract to the Austin Co., Bulletin Building, for a new one-story plant, 130 x 155 ft., at Hatboro, Pa.

The Cresson Township Power Co., Cresson, Pa., is being organized by Philadelphia interests, to construct and operate a power house and system in this section. Application for a State Charter will be made on July 17. James Collins Jones, Bullitt Building, Philadelphia, represents the company.

New England

BOSTON, July 10.

No business of importance transpired in the New England machine tool market the past week. Sales were confined to a very few single tools, mostly used, to diversified manufacturing interests. This condition is ascribed to the fact that the machine tool trade took a long holiday over July 4, as well as that a number of industrial plants considering the purchase of metal-working equipment, especially in the Connecticut district, have been closed for inventory and other purposes. The three New England railroads inquiring for equipment have temporarily postponed purchases, due to the strike. Local machine-tool dealers are still confident that a turn for the better has come and that several pending sales will be closed this week.

Plans have been filed with the Springfield, Mass., building authorities for a one-story and basement machine shop to be erected at Fisk Street and Roland Avenue by the Connery Machine & Tool Co.

The city of Providence, R. I., will erect a one-story, 67 x 124 ft. addition to its trade school on Dodge Street.

The Malden Cotton Tie Co., 59 Clinton Street, Malden, Mass., has begun, in a small way, the manufacture of remade cotton ties. Plant extensions are in order, but details have not been completed.

Joseph Richards, Elm Street, Southbridge, Mass., has purchased property, 100 x 200 ft., on which he and others will erect a plant to manufacture knives. Mr. Richards for several years was associated with the Richards Knife Co.

The Murray-Tregurtha Corporation, Boston, which is included in a merger of various properties under the name of the Associated Motor Industries, a $80,000,000 consolidation, maintains a plant on the Neponset River, Atlantic, Quincy, Mass. During the war the company did considerable motor construction work for the Government and since has confined its activities largely to motor building.

The Sexton Can Co., 31 Cross Street, Everett, Mass., plans at an early date to build an addition sufficiently large to give employment to 100 extra men, which will bring the number up to 350. Contract for the addition has not been let as yet.

The Boston Sand & Gravel Co., 88 Broad Street, Boston, has filed plans for a one-story machine shop at 300 Condor Street.

The National Metal Seal Co., Morrills Corner, Portland, Me., has preliminary plans for rebuilding the portion of its plant destroyed by fire, June 16, with loss estimated at $400,000. The burned structures included the machine shop, press and other departments.

A vocational department will be installed in the two-story high school to be erected at Berlin, Conn., estimated to cost about $150,000. R. B. Showalter, superintendent of schools, is in charge.

The Kant-Luz-It Clip Co., Fitchburg, Mass., has leased the third floor of a local building for the manufacture of metal pen and pencil clips, and other metal specialties.

The Spaulding Mfg. Co., Chicopee, Mass., will soon commence the construction of a new power house at its factory. Jackson & Moreland, 387 Washington Street, Boston, are engineers.

The United Electric Railways Co., Providence, R. I., will build a new car barn and shop, 60 x 75 ft., to cost about $60,000.

A machine shop and other manual training departments, with complete mechanical laboratories will be installed in the new Thomas Snell Weaver high school, Hartford, Conn., to be 200 x 500 ft., and estimated to cost about $1,250,000.

A three-story vocational training and trade school, 70 x 120 ft., will be constructed on South Main Street, New Britain, Conn., estimated to cost about $150,000. Max Unkelback, 162 Main Street, is architect. Stanley J. Holmes is superintendent of schools.

The Pejepscot Paper Co., Brunswick, Me., has tentative plans for the erection of an addition at Pejepscot, Me., estimated to cost close to $1,000,000, including machinery, power equipment, etc.

The Beacon Oil Co., Beacham Street, Everett, Mass., has filed plans for the erection of a one-story addition to its machine and mechanical shops. It will also commence the immediate erection of a new one-story pumping plant.

The Monarch Mfg. Co., Bellows Falls, Vt., has preliminary plans under way for a new paper mill, 80x100 ft., estimated to cost about $50,000.

The Clark Brothers Bolt Co., Milldale, Conn., has awarded contract to the H. Wales Lines Co., Meriden, Conn., for a one-story addition, 50 x 104 ft.

Pittsburgh

PITTSBURGH, July 10.

While it would be an exaggeration to say that the local machine-tool business is active, it is true that there is a fairly good turnover, especially by manufacturers' representatives who maintain warehouses or showrooms. One house with such facilities the past week sold off the floor a 60-in. production milling machine, a 24-in. shaper and a good-sized lathe. From the first of the year this firm has been enjoying a much better business than those merely maintaining offices here. In a market such as had existed for more than a year, it is apparently an advantage to show buyers what they will get. The Jones & Laughlin Steel Co. in the past fortnight closed for considerable machinery for the re-equipment of the machine shop destroyed by fire several weeks ago. The purchases were almost entirely duplications of the destroyed tools and there was no open competition. The Pittsburgh Board of Education has not yet made awards against the list on which bids closed June 20, but action is expected soon. The McKeesport, Pa., school board will open bids July 13 on several tools for its manual training school. The New Castle, Pa., school board has closed on practically all of the tools on a list put out a few weeks ago. All bids on a shaper were thrown out and new bids asked, to close July 13. The order includes 11 lathes and almost all makes shared in the business. There were three 11-in. South Bend lathes, one 18-in. Oliver, one 13-in. Star, one 14-in. Sidney, one 14-in. Lodge & Shipley, one 14-in. Monarch, one 14-in. Willard, one 14-in. American and one 14-in. Reed Prentice. The Somers, Fitler & Todd Co., Pittsburgh, were awarded a compressor, milling and drilling machine, floor grinder, soldering furnace and much of the miscellaneous supplies.

A 5 per cent advance in radial drills has been announced by leading makers and the general drift of prices is away from the levels which recently prevailed, due to the increase in costs brought about chiefly by the coal strike. The crane market reflects a fair amount of interest by buyers, though the complaint of sellers is that there is considerably more prospective than actual business. The Northern Engineering Works, Detroit, lately took two 3-ton cranes and two 3-ton, 2-motor hoists for the American Laundry Machine Co., Cincinnati; also two 7½-ton heavy duty mill type 2-motor hoists for the Toronto, Ohio, works of the Follansbee Brothers Co. The Champion Engineering Co., Kenton, Ohio, was the successful bidder for three semi-mill type, 15-ton cranes for the West Leechburg Steel Co. There is an inquiry for a 50-ton crane and a 15-ton crane, but the identity of the prospective buyer is withheld. Nothing yet has occured in connection with the cranes for the new National Tube Co.'s plant at Gary, Ind., and there is an impression that only the makers of such cranes as the company now is using and have proved satisfactory will be asked to bid. There is no sign of life as far as machinery and cranes are concerned, in connection with the plant which the Jones & Laughlin Steel Co. some time will build at Hammond, Ind.

The Atlantic Refining Co., Chamber of Commerce Building, Pittsburgh, has purchased about 7½ acres, adjoining

its oil refinery in the Lawrenceville section, for about $350,000. The property heretofore has been held by the Pittsburgh Malleable Iron Co. and will be used by the new owner for an addition to its plant. Plans are under way for rebuilding the portion of the refinery at Franklin, Pa., recently destroyed by fire with loss approximately $100,000. Headquarters are at 3144 Passyunk Avenue, Philadelphia.

The Federal Electric & Mfg. Co., 501 Chartiers Street, Pittsburgh, manufacturer of electric switches and kindred products, has purchased a four-story factory at McKees Rocks, Pa., for $60,000, and will occupy the building.

The Keystone Power Corporation, Ridgway, Pa., will commence the erection of a one-story addition to its power plant, 100 x 100 ft., estimated to cost about $200,000, including machinery.

The Borough Council, New Kensington, Pa., will receive bids until July 18, for a 30-ton garbage incinerator plant, complete with electrical equipment and other machinery. W. N. Jenkins is secretary.

In connection with an improvement program to cost about $1,000,000, the receivers for the Pittsburgh Railways Co., Pittsburgh, will purchase a quantity of mechanical equipment, including two double truck steel dump cars, estimated to cost $35,500; vacuum oilers; car barn and yard equipment; rails, electric lines, etc.

G. C. Cross, Sharon, Pa., is arranging for the purchase of equipment for installation in a new automobile service and repair works on South Dock Street. Construction is under way.

The Pennsylvania-Ohio Electric Co., New Castle, Pa., has arranged for the sale of $200,000 in bonds, a part of the proceeds to be used for extensions and improvements.

The City Taxi Co., Warren, Pa., is arranging a list of machinery and tools for installation in the repair department at its proposed automobile service works. R. Norris is general manager in charge.

The American Water Works & Electric Co., 50 Broad Street, New York, operating the West Penn Co., West Penn Building, Pittsburgh, and its recently acquired subsidiary, the Monongahela Power & Railway Co., West Virginia, is concluding arrangements for the purchase of the Potomac Public Service Co., operating at Hagerstown and Frederick, Md., and will consolidate this system with its other properties. Plans are under way for additions in power plants and systems of the different companies.

The H. C. Frick Co., Carnegie Building, Pittsburgh, will construct a new coal-loading plant and harbor on the Monongahela River, Luzerne Township. An underground electric railroad will also be built for transporting coal from the inland district to the new coal-loading plant.

The Chesapeake & Ohio Railroad Co., Roanoke, Va., has awarded contract to the Joseph E. Nelson & Sons Co., 3240 South Michigan Avenue, Chicago, for additions to its shops at Peach Creek, W. Va., consisting of an extension to the engine house; one-story machine shop, 60 x 75 ft.; one-story forge and blacksmith shop, 40 x 115 ft.; boiler washing plant, 60 x 90 ft. store house and oil works, 75 x 100 ft.; power plant and other structures. The expansion will cost about $350,000, including machinery. The company will also commence the erection of new coaling stations at Peach Creek, Raleigh and Thurmond, W. Va., and Clifton Forge and Charlottesville, Va., to be provided with coal crushers, screens, etc., and estimated to cost in excess of $225,000, complete. F. I. Cabell, Roanoke, is chief engineer.

The Western Pennsylvania Power Co., West Penn Building, Pittsburgh, will soon commence the erection of a one-story addition to its power plant at Ronceverte, W. Va., estimated to cost about $500,000, including machinery. The J. G. White Engineering Corporation, 43 Exchange Place, New York, is engineer.

The Board of Works, Morgantown, W. Va., will install power plant equipment, electric pumping machinery and other apparatus in connection with extensions and improvements in the sewerage system. The work is estimated to cost $750,000, and bonds for this amount are being arranged.

Buffalo

BUFFALO, July 10.

The Superintendent of Public Works, Albany, N. Y., is taking bids until July 25 for the construction of a crane runway, installation of electrical equipment and other mechanical work at the barge canal terminal, Syracuse, N. Y. Charles L. Cadle is superintendent.

The Peckham Vocational School, 321 Peckham Street, Buffalo, is said to be arranging a list of equipment for machine shop and other departments.

W. A. McDougal and R. E. Powers, receivers for the Ericsson Mfg. Co., 1100 Military Road, Buffalo, manufacturer of Magnetos and kindred equipment, will offer the plant and buildings for sale on July 25, comprising about 12 acres of land and buildings with total floor area of 75,000 sq. ft., fully equipped.

The Geneva Brick Products Corporation, Geneva, N. Y., is planning for the installation of new machinery. R. A. Catchpool is head.

A vocational department will be installed in the new Westside junior high school to be erected at Erie, Pa., for which bids will be asked late in August. It is estimated to cost about $500,000.

The Board of Commissioners, Buffalo, will take bids at once for a municipal incinerating plant, estimated to cost about $500,000, including equipment. Commissioner Kreinheder is in charge.

The Board of Education, 1401 Telephone Building, Buffalo, will receive bids until July 18 for steel lockers for installation at a number of schools. D. J. Sweeney is deputy superintendent in charge.

The Deer River Power Co., Copenhagen, N. Y., is arranging for the installation of equipment in a new machine shop.

The Rogers Heating Co., Ransomville, N. Y., is making inquiries for steam and hot water boilers of different sizes.

The City Council, Buffalo, has authorized the purchase of property on North Elmwood Avenue, the site to be used for the construction of a new vocational school, estimated to cost close to $500,000. Plans will be prepared at an early date.

The Genesee Light & Power Co., Batavia, N. Y., will make extensions and improvements in its power houses and system at Attica and Pembroke, to cost about $55,000.

Cleveland

CLEVELAND, July 10.

Local manufacturers of turret lathes, automatic machinery and drilling machines report a fair volume of business, mostly for single tools. Some small lot orders are coming from automobile and automotive accessory plants. The demand from the automobile builders appears to be largely for special machinery. No new inquiry of any size came out during the week.

Some dealers are getting a good volume of single tool orders but others report the demand a little less active than a few weeks ago. The call is more for new than for used machinery. No action has been taken as yet on the 30 tools required by the Cleveland Board of Education, for which bids were received last week. The American Steel & Wire Co., is inquiring for an angle iron bending machine.

Employment had increased 4.5 per cent on June 30 over May 29 in 100 of the largest local metal-working plants, including automobile works, according to monthly statistics gathered by the Cleveland Chamber of Commerce.

The demand for hydroelectric equipment shows a marked improvement. During the week the Power Construction Co. awarded a contract to the Allis-Chalmers Co., Milwaukee, for two 20,500 hp. turbines to operate under a 345 ft. head at 360 r.p.m., to be installed near Readsboro, Vt. The Allis-Chalmers Co., has also taken an order from the Minneapolis Utilities Co., for two 4000 hp. single vertical turbines with steel plate spiral casings. The Wellman-Seaver-Morgan Co., Cleveland, has taken an order from the Penobscot Power Co., for three 1000 hp. open flue single vertical turbines to operate under a 16 ft. head at 100 r.p.m., to be installed near Bangor, Me. The State of New York Development of Canal Power received bids July 10 for two 4000 hp. turbines, being the first units to be installed in canal water power development work along the Mohawk River above Cohoes, N. Y. These turbines will operate under a 26½ ft. head at 90 r.p.m. and will be placed in concrete spiral casings. Dothan, Ala., will receive bids July 15 for two 1500 hp. turbines.

The Geo. J. Hagan Co., has taken an order from the Link-Belt Co., Indianapolis, Ind., for an electric heat treating furnace and another from the Portsmouth Stove Co., Portsmouth, Ohio, for a furnace for baking stove parts. Both furnaces will be provided with General Electric heating equipment.

The Youngstown Board of Education has divided woodworking machinery for the new Rayen High school among the following: Strong, Carlisle & Hammond Co., Cleveland, $1,432; Oliver Machinery Co., Grand Rapids, Mich., $2,774.20; J. A. Fay & Egan Co., Cincinnati, $1,202.74; Cleveland Tool & Supply Co., Cleveland, $570.

John Z. Shunk, Bucyrus, Ohio, has purchased the Bucyrus plant of the Allen Motor Co., which was offered at auction a few days ago. The sale price was $25,000 for the building and real estate, not including the machinery.

The Reeves Mfg. Co., Dover, Ohio, is having plans pre-

pared for a one story factory and warehouse addition.

The Iten Fiber Co., Cleveland, has acquired the plant formerly occupied by the Cleveland Scissor Co., on East Sixty-seventh Street, and will engage in the manufacture of fiber products. It has purchased about $15,000 worth of metal-working machinery.

The Hodes-Zink Co., Fremont, Ohio, makers of automobile accessories, has leased a building at Tenth and Parade streets, Erie, Pa., for a branch factory. It manufactures automobile tops and other accessories. A. E. Blenner will be manager of the Erie plant.

The Safe Storm Shield Co., Fremont, Ohio, plans to erect a three story brick factory, 66 x 132 ft., to manufacture automobile tops and accessories.

The Industrial Steel Castings Co., Toledo, Ohio, has purchased a site adjoining its plant and contemplates the erection of two additional factory units, duplicating its present plant.

The Bowman-Vaughn Co., Lisbon, Ohio, manufacturer of wheel toys, will build a new plant, 100 x 120 ft. It is controlled by the George H. Bowman Co., Cleveland, which at present operates three toy manufacturing plants in Ohio, which will be merged in the new Lisbon plant.

The Arrow Motor Co., Sandusky, Ohio, recently incorporated to take over the Maibohm automobile plant in that city, has been organized by the election of A. C. Burch, president; Oliver P. Brace, vice-president; Joseph G. Pyle, secretary, and E. E. Ernst, treasurer. The board of directors includes the officers and R. E. Hayslett, treasurer Hydraulic Steel Co., Cleveland; E. G. Kirby and Stanley G. Hiatt, Toledo, and M. T. Brotherton, Detroit.

Cincinnati

CINCINNATI, July 1.

Practically all manufacturers report a slight improvement in the number of orders placed over the week previous. Some buying has been done by automotive industries and several small orders were booked by local manufacturers from a number of railroads. Two important railroad lists closed last week, but it is not expected that large buying will be done in the near future, as the railroad shopmen's strike is expected to have a dampening effect for the time being on purchases. Eventually, however, manufacturers look for the strike to prove somewhat of a boon to their industry. While buying of standard machines is showing only slight improvement, the increase in orders for special machines is fairly heavy. There is also a fair demand for punch presses and small portable electric tools. The price situation is tending upward, but no announcements of increases have been made since those of the radial drill manufacturers last week.

The Wadsworth Electric Co., Covington, Ky., has awarded contract for a one-story factory, 200 x 209 ft., to be erected in East Pike Street. It manufactures electrical supplies and when the new building is completed will increase its force to 300 men.

The Marietta Paint & Color Co., Marietta, Ohio, is having plans prepared for a factory to replace the one now in use at High Point, N. C. It will be four stories, 60 x 60 ft., and will consist of four units.

The Kentucky Wagon Works Co., Louisville, Ky., which is included in the merger of motor truck builders under the name of the Associated Motor Industries, is contemplating extensions to manufacture 4 and 6-cylinder automobiles.

The Wright Mfg. Co., Cincinnati, has been incorporated with a capitalization of $5,000 to manufacture metal specialties. T. B. Wright, formerly president Wright Traffic Signal Co., heads the new concern. Plans as to location and equipment have not as yet been completed.

Indiana

INDIANAPOLIS, July 10.

The Dodge Mfg. Corporation, Mishawaka, Ind., manufacturer of transmission machinery, etc., is disposing of a bond issue of $2,250,000, a portion of the proceeds to be used for extensions and improvements. W. W. Dodge is vice-president.

Fire, June 29, destroyed the power house and other mechanical departments at the plant of the Green Valley Coal Mining Co., Jacksonville, Ind., with loss estimated at $50,000.

Robert H. Hassler, Inc., 1535 Naomi Street, Indianapolis, manufacturer of shock absorbers and other automobile equipment, has awarded contract to the Builders' Construction Co., 540 North Meridian Street, for a new two-story and basement service building, 37 x 120 ft., estimated to cost about $75,000.

Fire, June 28, destroyed a portion of the plant of the National Tile Co., Anderson, Ind., with loss estimated at about $50,000, including equipment. It is planned to rebuild.

The Chicago & Eastern Illinois Railroad Co., 332 South Michigan Avenue, Chicago, has plans in progress for new car and locomotive shops and freight classification yards at Evansville, Ind., estimated to cost about $1,500,000.

Electrically-operated pumping machinery will be installed at the municipal waterworks plant at Auburn, Ind., in connection with extensions and improvements, estimated to cost about $65,000. The Common Council will call for bids at once, to close about July 20.

The Merchants Heat & Light Co., Indianapolis, has made application for permission to issue bonds for $7,205,000, the proceeds, to net $6,700,000, to be used in part for extensions and improvements.

Freight-handling equipment, conveying machinery, etc., will be installed in the new freight house to be erected at Gary, Ind., by the Baltimore & Ohio Railroad Co., estimated to cost about $125,000. H. H. Griffin is division engineer in charge.

The Zenite Metal Co., Indianapolis, manufacturer of automobile parts, will add a one-story building, 100 x 200 ft., to its plant at 201 North West Street. Herbert R. Duckwall is president of the company, which was organized in 1908 with $1,000,000 capital stock. Over 500 men are employed, but there is demand for an increased output.

Milwaukee

MILWAUKEE, July 10.

In the absence of railroad business, which appears to be awaiting the settlement of the shopmen's strike, the machine-tool industry is depending largely upon the automotive industries for the bulk of orders. These are coming in increasing numbers and buyers are going beyond the single tool orders which have characterized business so far. The milling machine trade is broadening steadily, with production schedules slowly increasing. The agricultural implement, gas engine and tractor industries are responsible for a part of the new business booked in the past few weeks, and prospects for heavier buying are regarded as bright. Foundry activity is making excellent gains and labor conditions are greatly improved in the foundry and machine shop industries. The Milwaukee office of the Federal Employment Bureau reports 8957 calls for help in June, and 6830 places filled, the best record in two years.

The Hercules Steel Casting Co., 871-881 Robinson Street, Milwaukee, which has not operated its electric steel foundry for more than a year, resumed operations July 5 with a force of 300. The plant has been entirely overhauled under the direction of F. G. Peterson, general superintendent, who recently assumed this position after five years' service as managing superintendent of foundries for the Bucyrus Co., South Milwaukee.

The Waukesha Foundry Co., manufacturer of brass castings, Waukesha, Wis., contemplates the extension of additions which will increase the capacity approximately 100 per cent during the coming four months. The present shop was erected two years ago and has been operating steadily but is overcrowded with orders.

The Specialized Automotive Service Co., Manitowoc, Wis., has been formed by Leo Bloomer, N. J. Jordan and John Bloomer, all of Madison, and will equip a building on Washington Street, near South Eighth Street, as a general machine shop, specializing in gas engine, tractor and automobile work.

The Harley-Davidson Motor Co., Milwaukee, has engaged the Federal Engineering Co., 444 Milwaukee Street, local, to design and supervise the construction of an additional story on its plant, at Thirty-eighth and Chestnut streets, to be 72 x 138 ft., of brick and steel. William Davidson is factory manager.

The Patton-Pitcairn paint and varnish manufacturing division of the Pittsburgh Plate Glass Co., with plant and offices at 213 Lake Street, Milwaukee, will build a five-story addition, 86 x 140 ft., at South Water and Lake streets, to be equipped for manufacturing, research laboratories, offices and storage. The project is in charge of Kirchhoff & Rose, architects, Majestic Building, Milwaukee, Ludington Patton is vice-president and general manager.

The North Light & Mfg. Co., Chippewa Falls, Wis., is planning to enlarge its works and buy additional equipment to handle a ten-year order valued at $2,000,000 calling for 1000 pumping units annually. It manufactures three sizes of pumps designed for country homes, dairy plants and isolated places. It also is putting into production a combination unit, consisting of a gas engine and pump.

The Board of Education, Kaukauna, Wis., has let the general contract to Hayes & Langdon, Janesville, Wis., for a new central continuation school and manual arts institute, estimated to cost $250,000. Shop equipment will be purchased later, specifications being still incomplete.

The Aluminum Goods Mfg. Co., Manitowoc, Wis., has placed the general contract with Walter W. Oeflein, Inc., 86 Michigan Street, Milwaukee, for a one-story brick and steel addition, 150 x 360 ft., to plant No. 2 in Manitowoc. It will cost about $150,000.

The Blum Bros. Box Co., Marshfield, Wis., which is erecting a $50,000 factory addition, is in the market for a 100-hp. heating boiler and miscellaneous machinery, including a 30-in. double planer, boxboard matcher, three jointers, one heading turner, etc., with individual motor drive.

The Trane Co., 127-129 South Sixth Street, LaCrosse, Wis., has awarded contracts for a brick and steel addition to cost about $50,000. If manufactures heating devices, vapor specialties and does general heating engineering and contracting business. Reuben N. Trane is vice-president and general manager.

The Barton Mfg. Co., Barton, Washington County, Wis., has been incorporated with a capital stock of $60,000 to manufacture automotive parts and specialties. It will take over an existing plant erected and equipped three years ago for the manufacture of motor truck axles, but expects to install additional equipment to accommodate a greater variety of production. The principals are William J. Goebel, S. J. Driessel and Emil C. Backhaus, all of Barton.

Baltimore

BALTIMORE, July 10.

The Republic Boiler & Radiator Co., Woodbury, Baltimore, has filed plans for two one-story additions, 20 x 150 ft., and 49 x 60 ft., respectively, estimated to cost about $50,000.

The Maryland Motors, Inc., 601 St. Paul Street, Baltimore, will take bids in about a week for a three-story service and repair works, 90 x 110 ft., at 414 North Calvert Street, estimated to cost about $75,000. Mottu & White, 324 North Charles Street, are architects.

The Baltimore & Ohio Railroad Co., Baltimore, will rebuild at once its grain elevators B and C, and pier No. 5, destroyed by fire, July 2, caused by lightning, with loss estimated at $3,500,000, including structures, equipment and contents. The new elevators will be of reinforced concrete, provided with mechanical conveyor systems. The plant will be electrically operated and is estimated to cost approximately the amount of the fire loss.

The Frostburg Sewer Pipe Co., Frostburg, Md., recently organized has acquired about 33 acres in the vicinity of the works of the Big Savage Fire Brick Co., as a site for its new plant to manufacture vitrified sewer pipe. Plans for the initial buildings are being drawn. The company address is temporarily care of the Frostburg Commercial Club.

H. S. Block, Baltimore, operating an automobile service and repair works at Eager and Cathedral streets, has purchased adjoining property for the erection of a three-story addition, 42 x 125 ft., estimated to cost close to $100,000, and designed to double the present capacity. J. E. Moxley, Jr., Equitable Building, is architect.

A vocational department will be installed in the new high school to be erected at Newark, Del., for which an appropriation of $400,000, has been secured.

The Western Maryland Railroad Co., Baltimore, has plans under way for extensions in its grain elevator plant at Port Covington, with mechanical and operating machinery to provide for an increased capacity of 2,000,000 bushels. It has foundation work under way for a new locomotive and car repair shop in the same section, estimated to cost about $50,000.

The Virginian Railway Co., Norfolk, Va., has plans in progress for a new coal pier at its Sewalls Point terminals, designed to double the present capacity. It will be mechanically operated and is estimated to cost $3,000,000. It is expected to require about 24 months to complete the plant.

The Town Council, Belhaven, N. C., will receive bids until July 19 for extensions and improvements to the municipal electric power plant, including semi-Diesel crude oil engine-generator, exciter, switchboard and other auxiliary machinery. William C. Olsen, Kinston, N. C., is consulting engineer; J. E. Shepardson is mayor.

The Bureau of Supplies and Accounts, Navy Department, Washington, will take bids at once for 106 hand drills, 64 soldering irons, side-cutting pliers, 1950 pipe wrenches, 114 dozen files, 608 gasoline torches, and 9 chain blocks, for use at Eastern and Western navy yards, as set forth in schedule 9645.

The District Commissioners, District of Columbia, Washington, will commence the immediate erection of a one-story power house, 50 x 122 ft., at the Gallinger Hospital.

The Case-Fowler Lumber Co., Macon, Ga., has preliminary plans under way for rebuilding the portion of its mill, recently destroyed by fire with loss of about $70,000, including equipment.

The Mallory Machinery Co., 524 Light Street, Baltimore, machinery dealer, is making inquiries for a motor of from 35 to 40 hp., complete with hand-control and electric brake, designed for intermittent service.

The Western Reserve Mills, Millen and Quitman, Ga., a subsidiary of the Mason Tire & Rubber Co., Kent, Ohio, is planning for the establishment of a new mill in the Southern district.

The United States Veterans' Bureau, Arlington Building, Washington, will receive bids until July 17, for two tankless air compressors, as specified in circular 1703.

Electrically operated pumping machinery, power equipment, etc., will be installed at the new filtration plant to be constructed at the municipal waterworks, Baltimore, estimated to cost close to $1,000,000. Plans are being prepared by William A. Megraw, City Hall, water engineer.

The Concocheague Brick Co., Williamsport, Md., will make extensions and improvements in its plant, including the installation of additional equipment, estimated to cost $35,000.

Freight-handling machinery, conveying equipment, etc., will be installed in the one and two-story freight station, 52 x 525 ft., to be erected at the foot of Brooks Avenue, Norfolk, Va., by the Chesapeake & Ohio Railroad Co., Richmond, Va.

The Mount Vernon Garage, 113 North Saint Asaph Street, Alexandria, Va., is planning for the installation of machines and small tools in its automobile service works.

The Central South

ST. LOUIS, July 10.

The Union Electric Light & Power Co., St. Louis, has ordered two 30,000-kw. turbo generators and condensing machines. One generator was purchased from the Westinghouse Electric & Mfg. Co., and the other from the General Electric Co. The Worthington Pump Co. has received the order for the condensers. Installation will be in the Cahokia plant now being built on the east side of the Mississippi River.

The Hall & Brown Woodworking Machinery Co., 1913-33 Broadway, St. Louis, will commence the erection of an addition to its plant, with improvements also in the present building, estimated to cost $50,000. Preston J. Bradshaw, International Life Building, is architect. Charles S. Brown is president.

The Erd Mfg. Co., 117 Sherman Avenue, Lexington, Ky., is planning for a one-story machine shop. A list of equipment is being arranged, including lathes, drills, punches, presses, bench tools, etc. Robert L. Erd heads the company.

The Central Paper Box Co., 2935 Belleview Avenue, Kansas City, Mo., will soon commence the erection of a new two-story and basement factory, 126 x 150 ft., on Belleview Avenue, estimated to cost about $35,000. Hans Von Unwerth, 507 Finance Building, is engineer.

The Memphis Wire & Iron Works, Memphis, Tenn., has preliminary plans in progress for the erection of a new factory on Third Street. McLean & Broadwell, Memphis, are architects. W. A. Haglin is president.

The Air Service, United States Army, Washington, has selected a site of 150 acres at Kansas City, Mo., for a new air terminal. Three army hangars will be constructed, with shop for repairs and parts manufacture. The Air Terminal Association, Kansas City, is interested in the project, and will occupy a corner of the tract for hangars and repair shop for private service.

The Pure Oil Co., Muskogee, Okla., is considering preliminary plans for an addition to its refinery, formerly the plant of the Oklahoma Producing & Refining Corporation, recently acquired, to increase the capacity to 5400 bbl. per day.

The Louisville Gas & Electric Co., Louisville, is perfecting plans for an addition to its Waterside power plant, to include the installation of a 27,000-hp. turbo-generator and auxiliary operating equipment.

A vocational department will be installed in the two-story and basement industrial school, 56 x 110 ft., to be erected by the State industrial department at Chillicothe, Mo., estimated to cost about $125,000. Samuel M. Hitt, 321 Sheidley Building, Kansas City, Mo., is architect; W. W. Huff, 313 Interstate Building, Kansas City, is engineer.

The Oklahoma General Power Co., Muskogee, Okla., has plans under way for a new electric generating plant with initial capacity of about 10,000 hp.

The White Co., 2001 Grand Avenue, Kansas City, Mo., has awarded contract to the George M. Bliss Construction Co., 510 Lathrop Building, for a two-story and basement

automobile service and repair building, 100 x 250 ft., at Twenty-ninth and Walnut streets, estimated to cost about $100,000.

The Iddins Machinery Co., Knoxville, Tenn., manufacturer of agricultural machinery, has plans under way for a new one-story plant on property recently acquired, estimated to cost close to $50,000. J. S. Sample is president.

The Atchison, Topeka & Santa Fe Railroad Co., 80 East Jackson Boulevard, Chicago, has plans nearing completion for a new one-story car repair shop, 100 x 160 ft., at Winfield, Kan., estimated to cost $60,000, including equipment.

The Star Box & Printing Co., Chattanooga, Tenn., has acquired a building at 61 West Colorado Avenue, Memphis, Tenn., for a branch plant to manufacture corrugated boxes, cartons and kindred products.

A vocational department will be installed in the two-story and basement junior high school, 63 x 175 ft., to be erected at Calhoun Street and Boonville Avenue, Springfield, Mo., estimated to cost about $180,000. Earl Hawkins & Co., 400 McDaniel Building, are architects.

Frank R. McCullough, Tulsa, Okla., has awarded contract to J. R. Burnside, 301 Drexel Building, for a two-story and basement automobile service building and repair department, 150 x 300 ft., estimated to cost about $150,000. Stone & Deegan, Kennedy Building, are architects.

A power house, ice-manufacturing and refrigerating plant will be installed at the new three-story dairy and ice-cream manufacturing plant to be erected at Walnut Street and Union Avenue, Memphis, Tenn., by the Clover Farm Dairy Co., Memphis. The ice-manufacturing department will have a daily capacity of 150 tons. William H. Timm, Perry Building, Philadelphia, is consulting engineer; L. N. Larned is general manager.

The Superior Folding Box Co., 211 Chestnut Street, St. Louis, has plans in progress for a new factory at Geraldine Avenue and Penrose Street, estimated to cost about $100,000, of which amount approximately $30,000 will be used for machinery.

The Oklahoma Portland Cement Co., Ada, Okla., will erect a new power plant at its local mills. Improvements will be made in the "dry process" plant, including machinery repairs and replacements.

Detroit

DETROIT, July 10.

The Wilson Body Co., 1440 Clay Avenue, Detroit, has awarded contract to the F. R. Patterson Construction Co., Ford Building, for the erection of a three, four, five and six-story addition, estimated to cost about $200,000. C. R. Wilson is president.

The Ford Motor Co., Highland Park, Mich., has awarded contract to the Austin Co., 208 South La Salle Street, Chicago, for a one-story addition, 80 x 260 ft., estimated to cost approximately $50,000. The company is reported to be planning the erection of works in the vicinity of Minneapolis for automobile and tractor production. It will include a hydro-electric generating plant and is estimated to cost in excess of $1,500,000. A site is being selected.

The Central Paper Co., Muskegon, Mich., has tentative plans for a three-story addition to its paper mill, estimated to cost about $200,000, including machinery. Construction is expected to commence in the fall, or may be deferred until early in the coming year. E. J. Geddes is secretary.

The Chapin Co., South Bend, Ind., is considering the construction of a new electric generating plant at Berrien Springs, Mich., to be used in connection with the interurban traction system between Dowagiac and Benton Harbor, Mich., recently acquired.

The Charles B. Bohn Foundry Co., 3651 Hart Street, Detroit, is having plans prepared for a new one-story building, 46 x 60 ft., estimated to cost about $45,000. C. W. Brandt, 1114 Kresge Building, is architect.

The Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich., has awarded contract to H. L. Vanderhorst, Grand Rapids National Bank Building, Grand Rapids, Mich., for a two-story paper mill addition, estimated to cost about $400,000, including machinery. It will be equipped as two complete operating units. J. Kindlebarger is president.

C. I. Scott & Co., Charlotte, Mich., manufacturers of cold air registers and other metal products, are planning to rebuild the portion of their plant destroyed by fire June 20.

A vocational department will be installed in the new high school to be erected at Eaton Rapids, Mich., estimated to cost about $125,000, for which bids will be asked at once. Fisher Brothers, Fisher Building, Pontiac, Mich., are architects.

The Guy Disc Valve Motor Corporation, Chelsea, Mich., recently organized with a capital of $1,500,000 to manufacture automotive products, has leased a portion of the local plant of the Lewis Spring & Axle Co.

The Pacific Coast

SAN FRANCISCO, July 5.

The Fresno Tire & Rubber Co., Mattei Building, Fresno, Call., has awarded contract to W. L. Miller, Los Angeles, for a new plant at Selma, Cal., estimated to cost about $125,000, including machinery.

The Doble Steam Motors Co., Call Building, San Francisco, has acquired property at Atascadero, Cal., for the erection of a new plant to manufacture steam-driven automobiles. Plans are being drawn for a building to approximate 100,000 sq. ft. of floor area. J. E. King is representative in charge.

The Los Angeles Gas & Electric Corporation, Los Angeles, has arranged for a bond issue of $5,000,000, a portion of the proceeds to be used for extensions and improvements.

The Foster Lumber Co., Ritner, Ore., has tentative plans for rebuilding the portion of its plant destroyed by fire, June 25, with loss estimated at about $100,000, including machinery.

The Western Die Casting Co., Berkeley, Cal., has taken bids on a general contract for a new one-story plant, 125 x 162 ft., on Napa Street, Vallejo, Cal., estimated to cost about $45,000, including equipment. C. E. Perry, Jr., P. O. Box 636, Vallejo, is architect in charge.

The Pacific Gas & Electric Co., 445 Sutter Street, San Francisco, and the Sierra & San Francisco Power Co., 58 Sutter Street, have been granted permission for the joint construction of a new hydroelectric generating plant at Spring Gap, on the Middle Fork of the Stanislaus River, Tuolumne County. It will have an initial capacity of about 7500 and is estimated to cost close to $1,000,000.

The Pridham-Low Co., Los Angeles, manufacturer of paper boxes, cartons, etc., has leased a new factory to be erected on O Street, Fresno, Cal., for the establishment of a branch plant. The machinery installation is estimated to cost close to $75,000, and will provide for the employment of about 100 workers.

The Grays Harbor Railway & Light Co., Hoquiam, Wash., will commence the immediate erection of a new plant on local site, estimated to cost about $250,000, including equipment.

The Long Beach Paper Box Co., Long Beach, Cal., has plans under way for a new factory on Cherry Avenue, estimated to cost about $100,000, including machinery.

The Atchison, Topeka & Santa Fe Railway Co., Kerckhoff, Los Angeles, will commence the immediate erection of a machine shop at San Bernardino, Cal., estimated to cost about $107,000, including equipment.

The Mineral Lake Lumber Co., Tacoma, Wash., is considering preliminary plans for rebuilding its plant, recently destroyed by fire with loss in excess of $200,000, including machinery. The new mill is expected to cost a like amount.

The Pacific Fruit Express Co., 65 Market Street, San Francisco, has plans under way for a new ice and cold storage plant at Tucson, Ariz. It will be electrically operated.

The City Council, Tacoma, Wash., has plans in progress for a new municipal steam-operated electric power plant, to cost about $350,000 with machinery.

The Columbia Wood Products Co., Raymond, Wash., has tentative plans for a veneer mill on the site formerly occupied by the plant of the State Lumber & Box Co.

The Gulf States

BIRMINGHAM, July 10.

The Missouri, Kansas & Texas Railroad Co., St. Louis, has completed plans for a one-story locomotive shop, 148 x 475 ft., with adjoining repair shops, at Waco, Tex., to cost in excess of $500,000, including machinery. The plant will have a capacity for rebuilding 10 locomotives per month, and will be constructed on the unit plan to permit of further expansion. Bowie, Loyden & Co., Inc., Chicago, has been awarded the general contract for the freight terminal at Denison, Tex., to cost approximately $450,000.

The Refugio Glass Co., National Bank of Commerce Building, San Antonio, Tex., is perfecting plans for new works on property recently acquired at Refugio to manufacture glass bottles for high pressure service and other glass containers. It will include a power house and is estimated to cost in excess of $75,000. W. L. Napier is general manager.

The Humble Oil & Refining Co., Houston, Tex., is disposing of a bond issue of $25,000,000, a portion of the proceeds to be used for extensions and improvements. It is

controlled by the Standard Oil Co. of New Jersey, 26 Broadway, New York. W. S. Farish is vice-president.

The Texas Power & Light Co., Dallas, Tex., has tentative plans for a power plant on the Colorado River in the vicinity of Bastrop, Tex. The company is concluding negotiations for the purchase of the municipal electric plant at Austin, Tex., and proposes to enlarge this station. W. B. Head is chairman of the board.

The Atlantic Ice & Cold Storage Corporation, Montgomery, Ala., has plans under way for an addition to its ice-manufacturing and cold storage plant to more than double the present capacity. It is estimated to cost in excess of $300,000, including machinery.

Fire, June 29, destroyed a portion of the car and locomotive shops of the Atlantic Coast Line Railway Co., at Montgomery, Ala., with loss estimated at close to $200,000. The general offices are at Wilmington, N. C.

The Dillingham Ice Cream Co., Breckenridge, Tex., will commence the construction of a new ice-manufacturing and cold storage plant, with initial daily capacity of about 65 tons.

The power plant of the Currie Power Co., Currie, Tex., has been acquired by local interests, headed by H. P. Tate and T. H. Williams, who will organize a company to operate the property. Plans are under way for an addition to more than double the present capacity. Mr. Tate will be president of the new organization.

The Preston Motors Corporation, Birmingham, manufacturer of automobiles, has arranged for a bond issue of $300,000, and stock issue of $800,000, a portion of the proceeds to be used for extensions and improvements.

Fire, June 25, destroyed the power house, saw mill and other portions of the plant of the Ward Lumber Syndicate, Benton, Ala., with loss estimated at close to $100,000. A quantity of machinery, practically new, was completely destroyed. It is said that the plant will be rebuilt at an early date. Arthur Ward is general manager.

The Williams-Miller Gin Co., Elk City, Okla., has plans under way for a new cotton oil manufacturing plant at Stamford, Tex., to cost about $150,000, including machinery. Samuel Williams is head.

The Common Council, Livingston, Tex., will commence the immediate erection of a new municipal electric power plant to cost about $30,000.

The Deems Tractor Hitch Co., 301 Bedell Building, San Antonio, Tex., recently organized with a capital of $30,000 to manufacture motor tractor equipment, has arranged with the Lone Star Motor Truck & Tractor Association to manufacture a line of its different specialties, and the association plant will be given over in part to this work. Later the Deems company proposes to operate its own plant. C. O. Deems is president.

Fire, June 27, destroyed a section of the power plant of the Dallas Power & Light Co., Dallas, Tex., with loss estimated at about $60,000. It will be rebuilt at once.

A vocational department will be installed in the new high school to be erected at Georgetown, Tex., estimated to cost in excess of $100,000. Plans will be drawn at an early date.

The Southwest General Electric Co., 801 North Lamar Street, Dallas, Tex., manufacturer of electrical specialties, will build a three-story addition, estimated to cost $95,000.

Canada

TORONTO, July 10.

Large purchases of machine tools from any one source are still absent from the market, but steady buying of one or two tools continues from a fairly wide range of customers. Equipment required for technical schools has furnished the greatest demand the past two or three weeks and a fair amount of business has been derived from this source. Automobile plants have also been purchasers and it is probable that more active buying from this source will shortly materialize. It is stated that the Durant Motors, Ltd., Toronto, is about to start work on an addition to the Leaside plant and considerable equipment will be required in the near future, as it is proposed to have the works completed and in operation by next spring. Other lines of industry are also making progress and while buying has been put off from time to time it is the opinion of dealers and manufacturers that purchases of equipment cannot be much further delayed. Small tools are in brisk demand and sales are continually mounting. Prices are holding firm on all lines.

Contracts have been placed for six 14-in. lathes for the Hamilton, Ont., technical school, three going to the D. McKenzie Machinery Co., Guelph, Ont., and three to the Perfect Machinery Co., Guelph.

The Preston Woodworking Machinery Co., Preston, Ont., has been awarded the contract for wood-working equipment to be installed in the new technical school at Sarnia, Ont. The list includes five lathes, one grinder, band saw, buzz planer, variety saw, surfacer and mortiser. In addition, the Canadian Fairbanks Morse Co., Toronto, has the contract for one milling machine, one shaper and one tool and cutter grinder. Charles A. Strelinger Co., Windsor, Ont., received the contract for lathes and heat treating furnaces.

The lumber mill of the Northern Construction Co., Kamloops, B. C., was destroyed by fire July 2 with a loss of about $100,000.

The Wigwam Paper & Pulp Co., Waldo, B. C., contemplates the erection of a paper mill at Elko, B. C., to cost $4,000,000.

The Canadian By-Products Co., Home Bank Building, Hamilton, is preparing to erect a plant for the manufacture of fire brick.

Col. Thomas Gibson, president Fort William Paper Co., Fort William, Ont., states that his company contemplates the extension of its ground wood and paper mill.

The Cape Breton Cold Storage Co., North Sydney, N. S., has let the general contract to M. J. Paulson, Gloucester, Mass., for the erection of a cold storage plant to cost $200,000.

The Dominion Steel Corporation, 120 St. James Street, Montreal, contemplates installing several new furnaces at its plant at Sydney, N. S., and making general repairs at an estimated cost of $15,000,000. Equipment and material required includes electric machinery, wire, cranes, steel, firebrick, etc. D. S. Hines, Sydney, N. S., is purchasing agent.

Bids are being received by John O. Coulter, clerk, Thessalon, Ont., for the supply and erection of a 200 hp. water turbine with governor, etc., direct connected to a 175 k.v.a. generator, complete with switchboard exciter, etc. James, Proctor & Redfern, Ltd., 36 Toronto Street, Toronto, are consulting engineers.

J. Waller & Sons, Gaukel Street, Kitchener, Ont., have had plans prepared and are receiving bids for a factory to cost $25,000. Architect, J. Knechtel, Courtland Street West.

The Steel Trough & Machine Co., Tweed, Ont., is building additions to its factory to take care of increased business and will install considerable new equipment.

Supplies, Ltd., Kentville, N. S., is in the market for equipment and machinery for an aerated water plant.

M. J. Armstrong & Co., Ottawa, Ont., are installing a new grinder, three lathes and a milling machine and have taken an option on property on Queen Street, 33 x 90 ft., for the erection of a machine shop to cost $10,000.

It is the intention of the Peninsular Sugar Co., to start construction on its new plant at Petrolia, Ont., in the near future. The refinery will have a daily capacity of 200,000 tons and the machinery will be electrically driven and of special design. When completed the plant will represent an expenditure of $800,000. It is expected to be ready for operation by September. H. J. French and Harry Gilroy are interested.

Trade Changes

The Pittsburgh sales office of the Economy Fuse & Mfg. Co., Chicago, has been moved from 2223 Farmers Bank Building to 1006 Peoples Bank Building at Fourth Avenue and Wood Street.

The Central Foundry Co. and the Central Radiator Co., both at 90 West Street, New York, and the Molby Boiler Co., Inc., 101 Park Avenue, have been consolidated. Headquarters will be at 41 East Forty-second Street. The different plants of the merged company, including the Central Radiator works at Lansdale, Pa., will be continued in operation.

The business of the Pittsburgh High Voltage Insulator Co. hereafter, will be carried on under the name of the Westinghouse High Voltage Insulator Co., C. M. Semler, general manager, announces. The company is a subsidiary of the Westinghouse Electric & Mfg. Co.

The Electric Furnace Construction Co., 908 Chestnut Street, Philadelphia, manufacturer of electric furnaces, "Electro" steam boilers, etc., reports an increase in capital and the election of the following new officers: P. H. Falter, vice president and treasurer; Arthur G. Dickson, of Dickson, Beitler & McCouch, Philadelphia, vice president and counsel, and the following new directors: John Gilbert, of Madeira, Hill & Co.; Wm. A. Webb, president Empire Coal Mining Co., and T. H. Weisenburg. Frank Hodson retains the presidency of the company. Mr. Falter, the new vice president and treasurer, is a graduate of the engineering department of the University of Michigan, and until recently has been vice president and general manager of the

Canadian Electro Products Co. He has been general manager of the Baltimore Electric Alloys Co., in the manufacture of ferrosilicon and other electric furnace alloys, and was for 13 years with the Aluminum Co. of America in various capacities, including design, construction and operation of a number of its plants. Mr. Falter was also general manager of the Shawinigan Electro Metals Co., Montreal, manufacturer of metallic magnesium, and he has also had considerable experience on hydro-electric power plant work at Sault Ste. Marie and Shawinigan Falls, Canada.

Jay L. Hench, who recently resigned as district sales manager Lackawanna Steel Co. at Chicago, has formed a new company under the style of Jay L. Hench & Co., to engage in the purchase and sale of various iron and steel products, including steel sheet piling, light and heavy tee rails, sheets, plates, shapes and bars, with an additional line of open-hearth and electric steel castings. He has opened headquarters at 208 South LaSalle Street, Chicago. Mr. Hench was identified with the Lackawanna Steel Co. at Chicago for 11 years, during the last three of which he was district sales manager. Prior to his service with the Lackawanna Steel Co. he was for five years associated with Joseph T. Ryerson & Son, a greater part of the time as sales representative in Michigan and Indiana. Mr. Hench was educated at Cornell University, where he specialized in iron and steel metallurgy. In 1915 he entered the employ of Illinois Steel Co. and for a year was engaged in practical work in the open-hearth and Bessemer departments at South Works.

J. L. HENCH

The Louis Allis Co. is now the name of the Mechanical Appliance Co., Milwaukee, which was established in 1901 and is the manufacturer of the Watson direct and alternating current motor. Louis Allis, president of the company, says that there is no change in policy or personnel of the organization.

The Younglove Construction Co., United Bank Building, Sioux City, Iowa., has been appointed representative of the Conveyors Corporation of America, 326 West Madison St., Chicago, for the sale of American trolley carriers in northwestern Iowa, and in South Dakota.

The General Fireproofing Co., Youngstown, has appointed R. S. Gildart, Cleveland, advertising manager. Mr. Gildart was formerly director of publicity for The American Malleable Castings Association, Cleveland, prior to which he was advertising manager for the P. B. Yates Machine Co., Beloit, Wis. and the Kelvinator Corporation, Detroit. C. W. Noble, who has been advertising manager for several years, has been advanced by the company and will conduct market investigations and special research work.

Irving A. Berndt, Dwight T. Farnham and Walter G. Scott, have withdrawn from the C. E. Knoeppel & Co., consulting industrial engineers, New York, of which they were vice-presidents. The arrangement amounts to a friendly dissolution of the firm, leaving all free to serve industry in a personal way, at the same time collaborating with one another. The name of C. E. Knoeppel & Co. is retained and remains under the direction of C. E. Knoeppel.

W. L. Dixon and J. F. Griswold, Los Angeles, Cal., for 16 years Pacific Coast distributors of the Bain Wagon Co., Kenosha, Wis., have acquired the controlling interest in the corporation from George A. Yule, and on July 1 assumed the general management of the works and business. Mr. Yule is retained in the capacity of president for the present. The Bain Wagon Co. is one of the oldest and largest manufacturers of horse-drawn vehicles in the United States, having been established in 1840.

The Wright-Alexander Co., Boston, machine tools, formerly located at 201 Devonshire Street, is now located at 126 Massachusetts Avenue, that city. The company has just been appointed agent for the Syracuse Sander Mfg. Co., Syracuse, N. Y.

The Cushman Chuck Co., Hartford, Conn., has established quarters at 130 High Street, Boston, for district distribution purposes.

The Iron & Steel Products Co., Pittsburgh, has removed from 230 Fifth Avenue to 421 Wood Street, occupying Suite 510, Citizens' Savings Bank Building, corner Wood and Diamond streets.

The South Boston Mfg. Co., South Boston, Va., incorporated with a capital of $100,000 to manufacture metal products, expects to build its own plant. It will manufacture farm wagons.

Industrial Finances

The plant and manufacturing facilities of the Wagner Electric Mfg. Co., St. Louis, are being operated at about 65 per cent of capacity, W. A. Layman, president, reports in a letter to the underwriters of the reorganization plan. Mr. Layman adds: "The net earnings of the company after deducting interest on the proposed bond issue and dividends on the preferred stock, but before charging physical depreciation, were for March, $44,000; for April, $52,000, and for May, $85,000. The business and earnings of the company are steadily increasing and there is every prospect that the entire manufacturing facilities of the company will be productively active within six months."

The Noiseless Typewriter Co., Middletown, Conn., has filed a preliminary certificate of dissolution with the secretary of that State. The company proposes to reincorporate under the laws of Delaware in order that it may increase its capitalization. All claims against the Connecticut corporation should be sent to Earl H. Russell, in care of the company at Middletown.

The Pfau Mfg. Co., Norwood, Ohio, manufacturer of plumbers' supplies, has been placed in the hands of receivers. The company has a large number of unfilled orders and bright prospects of obtaining a profitable future business. Difficulty in making collections of outstanding accounts is given as the reason for the receivership.

Receivers for the Texas Steel Co., Rusk, Tex., have secured permission from the District Court at Beaumont, Tex., to sell the plant and property of the company. It is proposed to hold the sale on Sept. 15. The holdings consist of an iron and steel works at Rusk, and a large acreage of iron ore lands in eastern Texas. The company was organized by the late L. P. Featherstone.

Final action has not yet been taken by the stockholders of the Sharon Steel Hoop Co. on a proposed issue of $5,000,000 8 per cent. cumulative preferred stock, but probably will be at any early date, according to Severn P. Ker, president of the company. If the new issue is approved, the authorized capital stock of the company then will be $20,000,000, consisting of $15,000,000 common and $5,000,000 preferred stock. Stockholders are to be offered $1,500,000 of the new issue.

The sale of the Electric Auto-Lite Corporation plants in Toledo and Fostoria, Ohio, to C. O. Miniger has been confirmed by the Federal Court. The purchase price was $4,700,000.

Directors of the Trumbull Steel Co., Warren, Ohio, have declared a dividend of 20c. per share on common stock and the regular quarterly dividend of $1.75 on preferred, both payable July 1 to stock of record June 20. The company has paid 15c. per share on its common stock for the past four quarters. Its second quarter dividends will be distributed from current earnings on operations running in excess of all dividend requirements. The company announces that it will treat shareholders as liberally as conditions warrant, with respect to future dividend distributions. It has $10,000,000 of preferred stock, all outstanding and $25,000,000 of $25 par-value common, with $12,500,000 issued.

J. N. Lapointe, principal stockholder of the Arnold Electric Tool Co., New London, Conn., has been appointed temporary receiver of that concern, following his application.

The Molle Typewriter Co., Oshkosh, Wis., manufacturer of writing machines, has filed a voluntary petition in bankruptcy, scheduling its assets at $262,028 and liabilities at $131,710. The principal items of assets are machinery and equipment.

New York and middle west bankers are offering for public subscription $5,000,000 Donner Steel Co., Inc., Buffalo, first refunding mortgage 20-year 7 per cent sinking fund bonds. The bonds are dated Jan. 1, last, and mature in 1942.

The Massachusetts court has appointed George A. Bacon and Samuel M. Green as co-receivers of the Harley Co., Springfield, Mass., drop forgings and castings, following a petition of creditors.

The Taft-Peirce Mfg. Co., Woonsocket, R. I., machinists, engineers, etc., has increased its capitalization from $300,000 to $1,200,000, according to an amendment to its charter filed at the state house, Providence, R. I.

The Hamilton Hardware Corporation and two other creditors have filed an involuntary petition in bankruptcy against the Eastern Brass & Ingot Co., Waterbury, Conn. George E. Dalbey recently was appointed receiver. The company is capitalized at $300,000, and is said to be solvent. The plant has been operating since last summer.

No action was taken by the stockholders of the Sharon Steel Hoop Co. at their special meeting on the proposed increase in the stock to $20,000,000, from $15,000,000. The matter was brought up again June 21.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

	Per Lb.
Bars:	
Refined iron bars, base price	2.58c.
Swedish bars, base price	7.00c.
Soft steel bars, base price	2.58c.
Hoops, base price	3.63c.
Bands, base price	3.23c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	2.68c.
Channels, angles and tees under 3 in. x ¼ in., base	2.58c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	2.60c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	2.80c.
Toe-calk, ½ x ⅜ in. and larger	3.40c.
Cold-rolled strip, soft and quarter hard	6.25c. to 7.25c.
Open-hearth spring steel	3.50c. to 6c.
Shafting and Screw Stock:	
Rounds	3.35c.
Squares, flats and hex	3.85c.
Standard cast steel, base price	12.00c.
Extra cast steel	17.00c.
Special cast steel	22.00c.

Tank Plates—Steel

¼ in. and heavier	2.68c.

Sheets

Blue Annealed

	Per Lb.
No. 10	3.63c.
No. 12	3.68c.
No. 14	3.73c.
No. 16	3.83c.

Box Annealed—Black

	Soft Steel C. R., One Pass, Per Lb.	Blued Stove Pipe Sheet, Per Lb.
Nos. 18 to 20	4.00c. to 4.30c.	.....
Nos. 22 and 24	4.05c. to 4.35c.	4.60c.
No. 26	4.10c. to 4.40c.	4.65c.
No. 28	4.20c. to 4.50c.	4.75c.
No. 30	4.45c. to 4.75c.	.....

No. 28 and lighter, 36 in. wide, 10c. higher.

Galvanized

	Per Lb.
No. 14	4.30c. to 4.60c.
No. 16	4.45c. to 4.75c.
Nos. 18 and 20	4.60c. to 4.90c.
Nos. 22 and 24	4.75c. to 5.05c.
No. 26	4.90c. to 5.20c.
No. 27	5.05c. to 5.35c.
No. 28	5.20c. to 5.50c.
No. 30	5.70c. to 6.00c.

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
⅛ in. Butt..	—56	—40	¾ in. Butt..	—30	—13
¾ in. Butt..	—61	—47	1½ in. Butt..	—32	—15
1-3 in. Butt..	—63	—49	2 in. Lap....	—27	—10
3½-6 in. Lap.	—60	—46	2½-6 in. Lap.	—30	—15
7-8 in. Lap..	—56	—34	7-12 in. Lap..	—23	— 7
9-12 in. Lap.	—55	—33			

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	3.50c. to 3.75c.
Annealed soft	3.50c. to 3.75c.
Galvanized annealed	4.25c. to 4.50c.
Coppered basic	4.00c. to 4.25c.
Tinned soft Bessemer	5.50c. to 5.75c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	16¾c. to 17½c.
High brass wire	17¼c. to 18 c.
Brass rod	14¾c. to 15¾c.
Brass tube, brazed	23¾c. to 24½c.
Brass tube, seamless	20 c. to 20½c.
Copper tube, seamless	22¼c. to 23½c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 20¾c. to 21¾c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14-20	
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	Primes	Wasters
		80 lb..	$6.05 $5.80
		90 lb..	6.15 5.90
		100 lb..	6.25 6.00
IC..	$10.00 $8.50	IC..	6.40 6.15
IX..	11.50 10.00	IX..	7.40 7.15
IXX..	13.00 11.25	IXX..	8.40 8.15
IXXX..	14.25 12.50	IXXX..	9.40 9.15
IXXXX..	16.00 14.00	IXXXX..	10.40 10.15

Terne Plates

8-lb. coating, 14 x 20

100 lb.	$7.00
IC	7.25
IX	7.50
Fire door stock	9.00

Tin

Straits, pig	33½c.
Bar	40c. to 44c.

Copper

Lake ingot	15¼c.
Electrolytic	15 c.
Casting	14¾c.

Spelter and Sheet Zinc

Western spelter	6¾c. to 7c.
Sheet zinc, No. 9 base, casks	8½c. open 9c.

Lead and Solder*

American pig lead	6¾c. to 7c.
Bar lead	8c. to 8½c.
Solder, ½ and ½ guaranteed	25c.
No. 1 solder	23½c.
Refined solder	20¼c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	75c.
Commercial grade, per lb	35c.
Grade D, per lb	25c.

Antimony

Asiatic	6½c. to 7c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb	25c. to 27c.

Old Metals

The market has been firmer this week, although business generally has been quiet. Dealers' buying prices are nominally as follows:

	Cents Per Lb.
Copper, heavy crucible	11.75
Copper, heavy wire	11.25
Copper, light and bottoms	9.00
Brass, heavy	6.00
Brass, light	5.00
Heavy machine composition	8.50
No. 1 yellow brass turnings	6.25
No. 1 red brass or composition turnings	7.75
Lead, heavy	4.50
Lead, tea	3.25
Zinc	2.75

THE IRON AGE

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Successful Safety Week at Ford Plant

The Making of 30,972 Cars by 46,627 Workers Without a Major Accident and With a 50 Per Cent Reduction in Minor Accidents

A WEEK of intensive safety work among the 46,627 workers at the Highland Park plant, Detroit, of the Ford Motor Co. produced astonishing results, according to figures obtained from the department of safety and factory hygiene of the company. During this period 30,972 cars were manufactured, in conjunction with the various branches; 1253 carloads, or 31 trains of 40 cars each, were loaded with finished parts and shipped over the entire country, and a proportionate number of railroad cars filled with raw materials entered the plant. This was all accomplished without a major accident, and minor accidents were reduced 50 per cent.

There were no fatal accidents; no amputations of fingers, toes, etc., and no eyes lost. Four accidents involved the loss of one day each; three, two days each; two, four days each; one, five days; two, six days each; four, seven days each; one, ten days, and one, 14 days. A total of 18 cases and 87 days lost time. Only two cases entered the compensation period which starts after the seventh day. These were foot accidents, caused by dropping material.

Employees worked a total of approximately 276,000 days. The days lost through accidents amounted to 87. According to the scale of time losses advocated by the U. S. Bureau of Labor Statistics, this would give a frequency rate of 8.15 lost time accidents per one million *hours* worked; and a severity rate of 0.32 lost *hours* per one thousand *hours* worked.

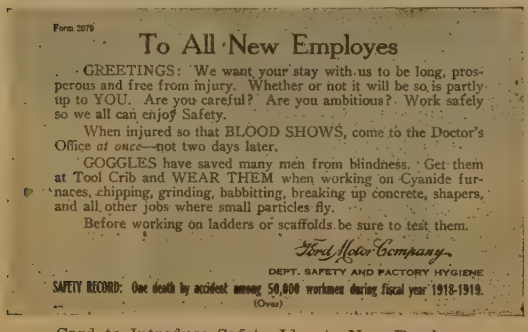
Every employee was instructed in the safe operation of his particular job at group meetings conducted by superintendents and foremen during the lunch periods on all shifts. The reproduced photographs show a few of these meetings in progress:

The picture at the bottom of page 130 was taken on the roof of a six-story building. The men are almost continually engaged in hazardous work on scaffolds, etc. Those in the upper left hand corner have just recently completed the painting of the large smoke stacks shown in the rear of the picture. This factory paint department went 46 consecutive months without a lost time accident.

Another picture shows a meeting in progress in the drop forge department, where axles, connecting

Lunch Hour Talk in the Drop Forge Department for Which Improvised Seats Were Obtained

rods, etc., are formed under steam hammers. The large upsetting machines shown press hot metal into gear blanks and other automobile parts. The



Form 2079

To All New Employes

GREETINGS: We want your stay with us to be long, prosperous and free from injury. Whether or not it will be so is partly up to YOU. Are you careful? Are you ambitious? Work safely so we all can enjoy Safety.

When injured so that BLOOD SHOWS, come to the Doctor's Office *at once*—not two days later.

GOGGLES have saved many men from blindness. Get them at Tool Crib and WEAR THEM when working on Cyanide furnaces, chipping, grinding, babbitting, breaking up concrete, shapers, and all other jobs where small particles fly.

Before working on ladders or scaffolds be sure to test them.

Ford Motor Company

DEPT. SAFETY AND FACTORY HYGIENE

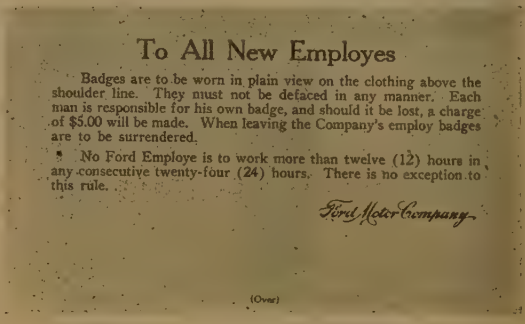
SAFETY RECORD: One death by accident among 50,000 workmen during fiscal year 1918-1919.

(Over)

Card to Introduce Safety Idea to New Employee

men were gathered into one end of the building and made as comfortable as possible on improvised seats. The talks were illustrated with objects that had and could cause accidents. As a result, this extremely hazardous department had no lost time accidents during safety week.

At the head of the article is shown one shift of the body pressed steel department. This department employs 2767 men,who make more than 350 different parts for the Ford car. Four hundred punch presses and 950 other machines are used in this work. The punch press is considered one of the most dangerous machines in industry. During the week 78 carloads of steel were made into fenders,



To All New Employes

Badges are to be worn in plain view on the clothing above the shoulder line. They must not be defaced in any manner. Each man is responsible for his own badge, and should it be lost, a charge of $5.00 will be made. When leaving the Company's employ badges are to be surrendered.

No Ford Employe is to work more than twelve (12) hours in any consecutive twenty-four (24) hours. There is no exception to this rule.

Ford Motor Company

(Over)

General Rules Are Given on Opposite Side of Card

running boards, shields, etc. The meeting shown in the picture was held in celebration of no lost time accidents during safety week.

The Factory Paint Department Went 46 Consecutive Months Without a Lost-Time Accident

All new employees who entered the plant were given a card, here reproduced, to instill the safety idea while their minds were eager to learn of the company's policies. The card has suggestion value for broad use in industrial plants generally.

Superintendents and foremen will hold meetings, similar to those held during safety week, on the first work day of each month hereafter, to keep alive the spirit of co-operation which prevailed during the drive.

OPPOSE PITTSBURGH BASING

Attorneys-General of Two States Write to Attorney-General Daugherty

MADISON, Wis., July 15.—Attorney-General William I. Morgan of Wisconsin, has sent to Attorney-General Harry M. Daugherty a letter in which he says:

It has come to my attention that you have publicly requested expressions of opinion upon the proposed merger of steel producing corporations which is before your department for consideration. One matter that is of vital importance to the people of Wisconsin in relation to the steel industry is the practice of making steel prices upon a Pittsburgh base price plus the freight from Pittsburgh to the point of delivery. As you know, the Federal Trade Commission has made a formal complaint against the United States Steel Corporation and its subsidiaries with reference to this practice and is conducting an exhaustive inquiry into the matter. It has occurred to me that in connection with the proposed merger the method of fixing prices may have come before you for consideration, and in that event I wish to urge most strongly that nothing be done that will have a tendency to legalize or perpetuate the Pittsburgh plus system or to embarrass the Federal Trade Commission in its treatment of the question now before it. On the contrary, it is my earnest hope that in dealing with the proposed steel merger it will be possible for you to take positive action against the Pittsburgh plus practice and aid the nation to rid itself of that evil.

Pittsburgh plus has been for a number of years a matter of deep concern to the people of Wisconsin as a whole. The manner in which the interests of the State and its people are prejudiced by the practice is well expressed, though of course only briefly in joint resolution No. 31, adopted by the Wisconsin Legislature of 1921, of which I inclose a copy herewith. This resolution, in addition to setting forth the situation as it affects the people of this State, constitutes an official recognition by the legislative branches of our State Government of the public interest involved. I trust that the time is not far distant when the Pittsburgh plus evil will be permanently eliminated, and if you can do anything to aid in bringing about that result, either in connection with the proposed steel merger or otherwise, you will in my opinion be rendering a very great public service.

Protest from Illinois

CHICAGO, July 17.—The recent invitation of Attorney-General Daugherty for expressions of opinion from those connected with the iron and steel trade on the mergers of independent steel companies now having the attention of the Department of Justice, has brought a response from Edward J. Brundage, Attorney-General, State of Illinois. In his letter dated July 8, Mr. Brundage, as did W. E. McCollum, secretary, Western Association of Rolled Steel Consumers, in a letter to the Attorney-General published in THE IRON AGE, July 13, page 85, emphasizes the harm that will be done business interests in this section if, as a result of the combinations, the "Pittsburgh plus" practice is made more solid. Mr. Brundage's letter reads in part:

This practice is injurious to the industries of this section of the country and it is contended complicates housing and building problems because of the increased cost of steel which results from the addition of the arbitrary amount to what would otherwise be the price of steel at mills in this section of the country. It is contended that this practice amounts to an unlawful fixing of prices and this contention forms the basis of the proceedings now pending before the Federal Trade Commission.

If the effect of the mergers under consideration by you is to put the combining concerns in a position where this practice is on a more solid basis, it would be harmful to the business interests of this section.

I suggest, therefore, that in the investigation of these mergers, consideration be given to the question which I have above stated and that no action be taken which can be construed as an approval of the "Pittsburgh Plus" practice or which will aid those who are maintaining it in making it more effective.

Advanced Courses in Metallurgy at Carnegie Tech

Carnegie Institute of Technology, Pittsburgh, has been selected by the United States Naval Academy at Annapolis to give advanced courses in metallurgy to its graduate officers. The institution is the only school in the country chosen for this work. Beginning next September, the Naval Academy will send two ordnance officers, graduates of the academy, for a year's study in advanced metallurgy. The officers will be here for the full college year. Their studies will be graduate work in advanced metallurgy with some studies in electricity and physical chemistry. Other groups of graduate officers are assigned each year to various colleges or universities to study along specialized lines. F. F. McIntosh, associate professor in metallurgy at Carnegie Tech, will supervise the studies of the Naval officers. Lieuts. Gilbert C. Hoover and John H. Keefe have been assigned to take the work the next college year.

Iron and Steel Companies Object to Freight Rates

WASHINGTON, July 18.—Eastern Pennsylvania iron and steel companies yesterday filed a complaint with the Interstate Commerce Commission, protesting against alleged discrimination against them and in favor of the Bethlehem Steel Co. in rates on steel products to New York. It is claimed that the rate from Bethlehem, Pa., to New York is 16c. per 100 lb., while the rate from plants of the complainants is 19.5c., a differential of 3.5c. or 70c. a ton. It is stated that if the rate from group B plants—that is, plants whose average distance from New York is 105 miles—were established on the same percentage of the fifth class as the rates from group A plants—that is, plants which are on an average distance of 175 miles from New York, the group B rate would be 16c., the rate from Bethlehem, or 57 per cent of the actual fifth class rate. It is further stated that if 16c. is the proper basis as related to the actual fifth class rate from Bethlehem, the rate from the other plants in group B should be 14c. and the rate in group A should be approximately 18c. per 100 lb. It is stated that the distance from Bethlehem and Nicetown, Pa., both in group B, to New York, is the same, yet there is a differential of 70c. in favor of the former. The complaining companies are the Alan Wood Iron & Steel Co., the American Bridge Co., the Lukens Steel Co., the Midvale Steel & Ordnance Co., and the Phoenix Iron Co.

Coal and Coke Shipments

Figures recently made public by the Pittsburgh office, United States Engineers, on the movement of coal and coke over the Allegheny, Monongahela and Ohio rivers, in May and June line up closely with the increases recorded in the rail shipments during that month. Western Pennsylvania Railroad coal loadings which fell below 1000 cars daily about the middle of April increased steadily in May and June, and in the last week in June reached a daily average of 2450 cars. River shipments in net tons, make the following comparison:

	June	May	Increase
Coal			
Allegheny	28,895	17,370	11,525
Monongahela	196,930	128,022	68,908
Ohio	106,011	138,350	*32,339
Total	331,836	283,742	48,094
Coke			
Monongahela	33,675	28,112	5,563
Ohio	16,600	16,765	*165
Total	50,275	44,877	5,398

*Decrease.

What Will Next Ten Years Bring in Steel?*

Drift Toward Consolidation—Profits Through New Economies in Production, Not by Any Price Maintenance Policy—Leadership Ability for Future Not Lacking

BY A. I. FINDLEY, EDITOR THE IRON AGE

THE men of the steel trade—leaders, lieutenants, rank and file and all—were surprised at the way their business picked up four months ago. Some of them are not sure to-day that they know why the country's steel plants have been turning out products for weeks at a greater rate than was reached in either of the peak pre-war years, 1913 and 1914. Hopeful as prophecies were thought to be at the opening of 1922, no man of light and leading in the business went further than to say that operations might get up to 60 or 65 per cent at some time before the year ended.

This is not the first time steel men have been taken unawares. The ups and downs of the past forty years have shown so many sudden reversals of form that one of the most dependable formulas in iron and steel is that it is the unexpected that happens. Yet every time of prosperity regularly produces a crop of prophets who are confident that pig iron and steel will never again sell as low as in the years before that particular boom. Likewise, when they are groveling in the depths of depression no other industry can show so many men who see no chance for prices ever to rise to the mad heights reached in the last previous ascent when clamorous buyers took pig iron from the blast furnaces before it fairly had a chance to cool.

There must be some connection between these uncertainties of steel, and the kind of men who have led in the development of the industry in the United States. No doubt something inherent in the industry has developed in those who work in it the willingness to risk; it is also the fact that the courage to push out that has been shown by so many American steel captains has put its stamp on the whole industry. Karl Wittgenstein, Austrian steel master of twenty years ago, sometimes called the "Carnegie of Austria, was a close student of iron and steel progress in the United States. He found here a high development of the speculative faculty—speculative in the better sense of willingness to risk uncertainties in carrying on great enterprises. He praised the American "capacity for taking into consideration besides the visible factors also the uncertain ones lying in the future, and of coming to corresponding decisions even at the risk of having events turn out quite differently."

This tradition of the uncertainties of steel making in the United States and of the American way of meeting them may need revising as time goes on. Prophecy is daring business to-day, just following a year in which production fell to the lowest point on record in relation to existing capacity. But that was a sequel of the greatest of world upheavals. Those who are trying to look ahead in steel see tendencies apart from the readjustments from war conditions, and are thinking of the outcome of these tendencies in the steel trade of five years or ten years from to-day.

The drift toward consolidation is probably the most obvious fact in the industry to-day. While for one reason or another some companies that have been included in recent merger projects have decided not to go ahead with those particular plans, the movement toward large capital aggregates is likely to go farther. The answer to the advantages the Steel Corporation has, so far as these are due to its diversity of product and to its vast raw material holdings, may be two or three large companies with plants at the various strategic points of production and distribution. Whatever the technical or official outcome of the action of Western consumers to do away with Pittsburgh basing in the sale of steel, independent producers are bound to take such steps as will insure to the corporation's chief competitors whatever benefits it now derives from the single-base régime.

Element of Governmental Scrutiny of Mergers

It is interesting, in connection with present efforts toward consolidation, to see that altogether apart from any initiative of manufacturers the Government at Washington is now preparing to pass judgment *in advance* on steps the steel industry may take without fear of prosecution under the Sherman act or the Clayton act. This is the very thing Judge Gary proposed, when the Gary dinners were being called in question and when Congressman Stanley was putting steel men on the grill to extract the evidence on which the dissolution suit was brought in 1911. But the Department of Justice in the Taft and Wilson administrations—in the Roosevelt days also, with the single exception of the permission given for the purchase of the Tennessee company by the Steel Corporation—steadily declined to say in advance whether a contemplated plan of a corporation might be carried out without inviting Government prosecution. Now, at the instance of the Senator from Wisconsin, the Attorney-General and the Federal Trade Commission have said to those about to merge, "Do nothing until you see us."

Like the policeman at the crossing, these Government agencies have set the "Stop" signal, not fully realizing, perhaps, all that will be involved later in turning the target to "Go."

These recent Washington moves, that have had their place in the news of the day along with other incidents classed as political, may have more of a bearing on the future of the steel industry than has yet been suggested. Next to the railroads, coal mining has been a chief object of Government attention. There are obvious reasons for Federal oversight of transportation, and more than one situation in the coal mining industry in the past twenty years has warranted Federal action; but even in the war period, with steel the most vital of all war implements, the full co-operation and competent management of the heads of the industry were judged at Washington to be far preferable to Government control of plants or output.

Just now the future of steel manufacture in its relation to the public seems likely to turn on the view taken by official Washington of what is aimed at in the consolidations under way and others that may come forward. In view of what has happened to them in the past year, and of what is ahead when the real test comes after the coal strike, the independent producers of steel urge that the new consolidation movement represents an effort to give the Steel Corporation real competition and hence is in the public interest.

Those who have been declaiming at Washington against any further concentration in steel on the ground that monopoly is aimed at through final co-operation with the United States Steel Corporation forget the narrow ground on which the decision favorable to the latter was given in 1920. The participation of Justices Brandeis and McReynolds in any future suit based on proved co-operation between the Steel Corporation and its competitors would be quite certain to give a different outcome. The Steel Corporation seems to have had this well in mind in deciding its market policy since the famous suit.

The course of the steel market in the past two years gives no ground for expecting that the Steel Corporation will make the race easier for its competitors in the years just ahead.

Profits will be made in the coming five years by new economies in production and not by any policy of price maintenance entered into by the leading producers.

*Reprinted by permission from *Forbes Magazine* of July 8.

And economy in production means that the steel companies will continue to be prodigal spenders for labor-saving, fuel-saving, and time-saving equipment and for new facilities to get increased tonnage. The steel company bond issues of the past few years are an index of the unending call for capital to provide new capacity and to make the old more efficient. That more than $100,000,000 has been appropriated first and last by the Steel Corporation for Gary alone, suggests the scale on which other steel makers must lay out money to maintain their position. It is one of the reasons also for the effort to get greater strength by further consolidation.

The question may be raised whether the future will bring any change in the policy long followed in iron and steel, of building new plants when the pressure of demand is greatest, with the frequent result of having the newly finished capacity ready just as the market turns downward as depression comes on. Thus the new capacity at Gary lay quite undigested for three or four years. But each return of prosperous times has called for all the plants in existence and more; and so the process of over-building and of catching up has been repeated time after time.

More consolidations in steel might bring, in the next decade, some modification of this traditional practice. Blast furnaces and steel plants mean huge money outlays. One modern blast furnace with accessory ore yard and auxiliary equipment represents $2,000,000, or four times the outlay of twenty-five years ago. Rolling mills for the production of finished steel can be built cheaply in comparison with the cost of the blast furnaces and steel works requisite to feed them. Thus the idleness of a rolling mill in time of depression is far less serious from the investment standpoint than that of blast furnaces and steel plants.

Carrying Large Stocks May Be the Rule

Strong companies may yet find that there are economies in carrying large stocks of raw and semi-finished products—pig iron, ingots, slabs and billets—with ample finishing capacity for the peaks in demand. The stored pig iron and raw or semi-finished steel would simply represent to an integrated company the putting of a certain amount of labor upon given quantities of ore and coal it has in the ground. It can be seen that the interest on capital required for carrying such stocks might be far less than that involved in idle plant, with the added advantage of having pig iron and steel on hand to answer the call of the market when the revival came.

These matters of organization, competition, and the control of the instruments of production, in the steel trade of the future are interesting, but not less so is the question of the lines of steel consumption that are likely to see the greatest development in the next ten years. Without doubt the largest increases in uses of steel will be in the uncounted and almost countless lines that are individually of so little importance that they are not commonly catalogued. Railroad building, and automobile outlets are impressive. A skyscraper and a Queensboro bridge are spectacular; but the demand for which the bulk of the new capacity of the country has been built in recent years is rather that which ramifies into hundreds of uses and into thousands of sales to individual buyers.

In 1887, thirty-five years ago, the 2,000,000 tons of rails rolled in American mills were nearly three-quarters of the entire output of finished steel. In 1920, rails were just 8 per cent of the total of more than 32,000,000 tons. The large place long held by rails in the steel trade is responsible for the erroneous but common belief to-day that railroad demand is the steel manufacturer's chief dependence. It is often said in the discussions of well-informed business men, that in one way and another the railroads take 40 to 50 per cent of all the steel turned out. It is doubtful if at any time in the past twenty years the railroad consumption of steel has been more than 25 per cent of the whole. In late years, the percentage has been under 20; in 1921 it probably was little more than 10 per cent.

The average man is astonished to be told that wire products, many of them the most tenuous forms in which steel exists, now represent a larger annual tonnage than steel rails.

The leading wire company now lists no less than 5000 distinct products and manufacturing uses of wire.

Food containers call for a million tons of steel a year in the form of tin plate, and this use of steel is growing every day as the army of delicatessen buyers grows. In pre-prohibition days the crimped bottle cap was responsible for 50,000 tons a year on the books of the mills rolling steel for tin plate.

Steel Demand of the Future

A Central Western steel maker, who expects a 60,000,000-ton output for the United States by 1930, silences doubters by pointing out that there is not a civilized man, woman, or child on earth to-day who does not carry around from a quarter-pound to a half-pound of steel in pockets or clothing. There are the pen knife, the key ring, the belt buckle, the suspender and garter buckles, the pencil tip, the shoe shank, the shoe heel full of nails, and the steel buttons, eyelets, and snaps. There is practically nothing that the man of to-day eats or wears or uses in his work that is not made of iron or steel or produced by iron and steel machinery. From the toy shop to the automobile plant turning out a million cars in a year, the whole range of modern manufacture shows an increasing penetration of steel into every industrial activity and into the every-day life of the people.

Steel production has depended only in part on growth of population for its gains. Abram S. Hewitt, in his famous forecast of 1890, when British iron masters visited the United States in a body, advertised to the world the steady per capita increase in steel consumption year by year that even then had become an American habit. In 1890, in order to meet the demands, our steel works turned out 140 pounds per inhabitant. By 1900 the per capita had gone up to 347 pounds; by 1910 to 585 pounds; and by 1920 to 858 pounds. Steel is constantly replacing wood, and the great expansion in concrete work, which it was once thought would be at the expense of steel, has meant a larger call on the steel mills. No less than 600,000 tons of steel for reinforcing of concrete was produced in 1920.

Perhaps the most important changes to be looked for in the steel industry in the next ten years will be those affecting personnel.

Average Age of Steel Heads 59 Years

In the case of the Steel Corporation, some of these changes may come before the decade is half run. Breaks in the corporation's organization have been few—apart from the loss, one at a time, of five men whose names were prominent in the list of Andrew Carnegie's "young partners"—and the continuity in its management has been one of its great factors of strength. But every year now adds to the probability of new faces appearing in its higher official family. The average age of nine of its heads—chairman, president, and the seven presidents of manufacturing subsidiaries—is 61 years. The youngest of these subsidiary presidents is 53, and the oldest is 64.

Very similar is the showing in respect to the heads of important independent steel companies. Nine of them, with an aggregate of 532 years, average 59 years, and 59 is also the average age of the seven presidents of Steel Corporation subsidiaries.

Thus it may fairly be said that the steel industry gives conspicuous exemption from the edict of Osler. No other shows a stronger official personnel, and no other represents higher standards of executive capacity or greater mastery of the complicated problems of modern industry.

The past twenty years have been the most important in American industrial history, and it is fortunate that in such a period the steel trade has had the guidance of such practical hands. At the works, direction of operations has fallen to aggressive, well-trained men—school-and-works-trained, and where promotions have been made to higher executive places, they have been almost entirely of operating men. The oncoming second line is a strong one, and the industry need have no fear for the years just ahead, as retirement time comes for one and another of the seasoned leaders of to-day.

HOIST FOR CUPOLA CHARGING

Monorail Machine for General and Special Work —One Operator Controls All Movements

The Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., recently designed a cupola charging attachment for its form 24 C. H. monorail hoist, arranged as shown in the accompanying illustration.

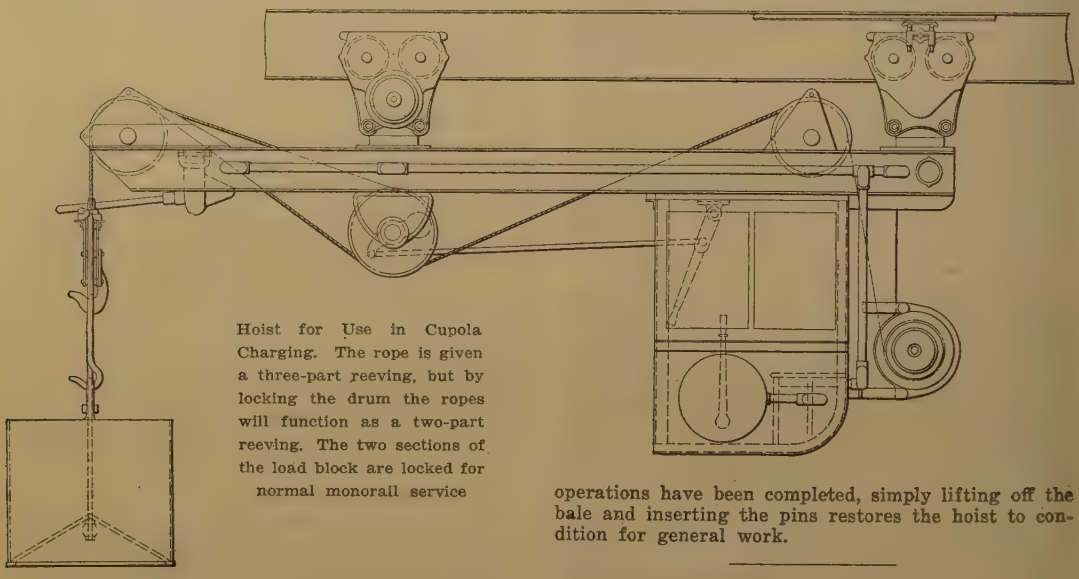
This machine is primarily a general service monorail hoist for all types of work for which hoists of that type are adapted, although extending its use to cupola charging has made several modifications of the standard form 24 unit necessary. In the machine illustrated the hoisting rope and load block are pendant from an extension of the hoist frame, which places them forward of the front trolley a sufficient distance to permit a suspended bucket to enter the cupola. In the standard machine, on the other hand, the hoisting rope and load block hang from the hoist frame a short distance back of the front trolley.

The hoisting rope is given a three-part reeving. The dead end of the rope is attached to an independently movable section of the load block, and one loop of the hoisting rope, which would normally pass around an upper sheave, is deflected over sheaves to an auxiliary winding drum located under the main frame. This drum is provided with a hand brake by means of which the drum and attached ropes may move in a manner normal for the ropes and upper sheave for a three-part reeving. By locking the drum the ropes will function as a two-part reeving; the dead end for the time being is at the periphery of the auxiliary drum and the third part of the rope, which was normally the dead end, with attached parts remaining stationary. The two sections of the load block are provided with pins for locking them together for normal monorail service, and to separate them so that they may function independently when operating as a cupola charging machine.

For cupola charging a bale carrying two extra hooks is hung across the top of the load block, and the pins are withdrawn. The hoist is then ready for cupola charging. The weight of the bale is sufficient to overcome the running friction of the hoisting rope, and the load block with its three hooks moves up or down as a unit just as if its several parts were connected together.

With the loaded charging buckets placed in line directly under the monorail runway, the operation of the charging hoist proceeds as follows: The hoist load block is lowered so that the three load hooks come opposite the three loops, forming the suspension members of the bucket. The hoist is then traveled forward until the hooks enter the loops as far as they will go, the hoisting motion being started and the bucket lifted to a height that permits it to enter the cupola door, the hoist being then traveled forward until the bucket enters the cupola and is central with the cupola walls. The lowering motion is started, the bucket descending into the cupola to within about 4 ft. of the top of the materials previously charged. The hand brake controlling the rotation of the auxiliary drum is set, the drum stands still, as also the upper section of the load block, the bale and the body of charging bucket. The movable bottom of the bucket continues to descend until the bucket is wide open when the lowering motion is stopped.

The contents of the bucket having been discharged, the hand brake is released and the bucket closes by its own gravity. The bucket is then hoisted to a level with the cupola door, the hoist traveled back, and the bucket deposited for refilling. It is detached by movements the reverse of those used in attaching it. Attaching and detaching buckets to the hoist, as well as other features of charging the cupola, are easily conducted by the hoist operator alone. When charging operations have been completed, simply lifting off the bale and inserting the pins restores the hoist to condition for general work.



Hoist for Use in Cupola Charging. The rope is given a three-part reeving, but by locking the drum the ropes will function as a two-part reeving. The two sections of the load block are locked for normal monorail service

New German Method of Hardening Steel

A new process for hardening steel has been patented recently in the United States by Wilhelm Winter, Remscheid, Germany. It is the result of experimental work by the inventor in his steel hardening plants at Remscheid, known as the Westdeutsche Stahl Harte Gesellschaft. Since the process was perfected over a year ago it has been in use in a number of German plants producing machine tools, gears, axles, springs, etc. An unusual degree of hardness is said to result from the application of the process and a considerable saving in cost.

There are two treatments, a heating bath and a cooling off process. The material to be hardened is first placed in the heating bath, where it remains until it obtains a temperature equal to that of the bath. When this stage is reached it is taken out and passed through a cooling-off process, which is accomplished without the use of any materials such as oil, water or compressed air. The patentee states that the feasibility of the chemical reactions appearing in the treatment has been demonstrated to the German patent office by laboratory analysis and experiment, and that the tests and demonstrations took place in the Technical High School at Charlottenburg.

Henry Engels, 55 Buffalo Avenue, Brooklyn, acquired the American patents late in June. He plans to have in operation soon a plant and testing laboratory for demonstrating the process. Hans Becker, Remscheid, Germany, recently arrived in the United States and will be associated with Mr. Engels in this work.

What Is Today's Shortage in Pig Iron?

The Trend of the Years Before the War and the Low Rate of Consumption Since Indicate a Deficiency of Over 25,000,000 Tons

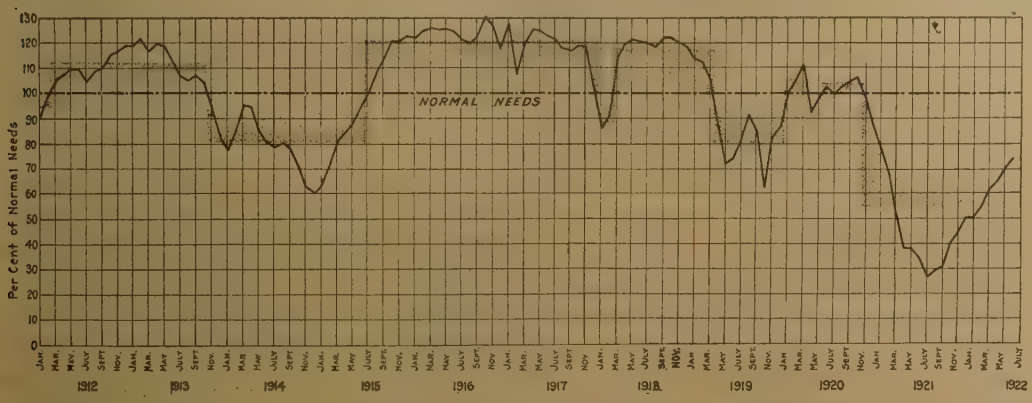
IF we take the mean of the ups and downs of production over a number of years, we approximate the trend of consumption or demand. Such a trend line extended for a period beyond the years of observation gives an indication of the approximate needs of the extended period. For pig iron such a curve and the corresponding figures of the theoretical requirements were given in THE IRON AGE of March 3, 1921.

Considering these needs as normal, then for a given month the actual production either more than satisfies the current normal or is short of doing so, or it may equal the calculated amount. Periods of excess must then be followed by periods of deficiency. Assuming no great change has occurred meanwhile in general conditions, the consumption of the material is following the law indicated by the past. This may mean that new uses are constantly being found for iron and its derivatives, that per capita consumption is therefore on the increase, and that the total is further swelled by increase in population. When against a line corresponding to the normal are plotted the percentages above or below the normal, then the eye gets a picture of the over-supply or under-supply.

A trend line over too long a number of years may cover such epochal changes in the material, such as a revolution in process, and therefore a revolution in possibilities of use or of price, that even short extensions into the future may exaggerate unduly the indications of the past. Thus, in the period of the war, so great was the dislocation of peace-time industrial activities that production statistics for that time might easily give an incorrect indication when combined with those of periods affected little or not at all by war.

In the accompanying curve for pig iron deviations from normal the years of the war were not considered. Eliminating from the calculation the unusual stimulus for output kept the line of apparent or theoretical needs lower than it otherwise would have been. In other words, the excess above the normal in the war period would not be so great as is indicated and deficiencies later would be greater. Moreover, no attempt has been made in determining the normal to assume or estimate any hoped-for increase in exportation. Should such increase occur it might indeed balance some other opposite factor not now apprehended. Naturally the records of a new group of years will bring about modifications of the equation which mathematically may be given to the trend line, and the normal line is thus subject to a change as sufficient additional information becomes available.

The shaded areas above and below the normal line are equivalent to the areas inclosed by the production curve. While they give an idea of a great deficiency in the amount of pig iron made, the theoretical deficiency is even greater, as to-day's normal needs are considerably greater than even those of war time. In the article referred to, it was shown that the production for the fourteen years ended with 1913 was hardly 1 per cent greater than the total needs for that period. Production was 309,453,000 tons and the theoretical requirements totaled 306,450,000 tons. Thus it may be said that 1914 opened with no deficiency. Then came subnormal production for all of 1914 and half of 1915 until war demand turned the scale, and we had 45 months of supernormal production, save for the months of January and February, 1918, when there was a temporary check, because of shortage of fuel and collapse of transportation, due in turn to weather of extreme severity. The 45 months of war activity gave an excess over theoretical needs of two and one-half times the deficiency of the 18 months immediately preceding, or a net excess of 13 million tons.



Excesses and Deficiencies in Pig Iron Production from Month to Month, the Comparison Being with Theoretical Requirements Determined by a Balancing of the Ups and Downs Over the Fifteen Years Before the War. The deficiency since early in 1919 appears to be 31 million tons to date. Allowing one-half of the 13 million tons excess production in the war period for peace time needs would leave a shortage of 25 million tons

But even assuming the country started at the end of the first quarter of 1919 with this excess of 13 million tons available for later consumption, there is still a great apparent deficiency. There were 9 months of under-production (the remainder of 1919), some over-production for the first three months of 1920, a slight falling backward for 2 months, then 5 months more on the positive side and finally the 20 months up to date, most of the time far below theoretical needs. In these 39 months, there were only 8 with output greater than needs.

The areas show that the deficiency due to sub-

normal production was fully 28 times the excess production. The figures indicate over 31 million tons deficiency, so that if the 13 millions excess of the war period were available, as it was not (much going into ships, shells and engines of destruction not now in existence), there would still be a shortage of 18 million tons; or if one-half of excess war production could be charged against peace-time pursuits, the shortage would be 31,000,000 minus 6,500,000, or 24,500,000 tons.

A decided change in the rate of consumption would need to be shown to nullify the claim of the shortage. It is to be noted that in spite of the improvement since July, 1921, when the production was only 27½ per cent of needs, the output of June, this year, was only 75 per cent of the normal and not as much as two-thirds of the total capacity of the country.

Methods for Locally Preventing Case Hardening

Protective Layers Applied with a Brush and Coating with Copper Compared by French Authorities

METHODS for locally preventing case hardening is the title of an interesting article in *Revue de Metallurgie* for April, 1922. The authors are Jean Galibourg and Marcel Ballay.

A method often employed is to cover the desired parts to be protected with a thin coating of copper, deposited electrolytically. This method presents numerous advantages, but it requires rather costly material and the method takes a long time because it needs two principal operations: First, the varnishing of the parts to be case-hardened and, second, the electrolytic coating of the remainder of the piece.

Many efforts have been made to obtain a simple method for the efficient protection against case hardening by coating the parts to be protected in one operation by a layer impermeable to the gases producing the cementation. The authors publish their results obtained on various methods.

I. Direct Application of Protecting Layer Applied with the Brush.

We have started with the principle clearly established by Guillet and Bernard that copper is the best of the usual materials to use as an anticementation coating.

Organic Varnish and Powdered Copper.—A paint formed of copper powder and a varnish, the base of which was resin and turpentine, has been used previously as a protection. This paint protects very imperfectly. A microstructure is shown in the original paper giving the penetration of carbon in material covered with this paint. The coating is also very fragile and is easily detached during handling. The inefficiency of this protection seems to come from the presence of carbon in the paint itself.

Silicate of Soda and Powdered Copper.—Very good results are obtained by replacing the organic varnish with commercial silicate of soda. A microstructure shows the results obtained on very soft steel, using a mixture of one part silicate of soda and one part powdered copper by weight. The case hardening is absolutely nil. This paint, copper-silicate, dries rapidly and resists rubbing and blows very well. As against this material may be advanced its high price, due to the high cost of powdered copper and its adherence to the piece after cementation and quenching. There is, as a matter of fact, a great deal of difficulty in detaching the coat which limits its use to the protection of parts that have to be afterwards machined.

Silicate of Soda, Powdered Copper and Inert Material.—The addition to the copper of a convenient inert material allows the cost of the coating to be reduced and the adherence after quenching. In the following table are given the results of some of the tests on bars case-hardened to 1 mm. depth:

Composition	*Results*	*Observations*
Powdered copper and silicate	Good protection	The coat is very adherent after quenching.
Copper ⅝, powdered emery ⅛ and silicate	Good protection	The coating detaches after quenching.
Copper ½, powdered emery ½ and silicate	Feeble penetration	The coating detaches after quenching.
Copper ½, powdered emery ⅝ and silicate	Strong penetration	The coating detaches after quenching.
Copper ½, kaolin ½ and silicate	Bad protection	
Copper ⅝, ferric oxide ⅛ and silicate	Good protection	The coating is adherent after quenching.
Copper ½, ferric oxide ½ and silicate	Feeble penetration	The coating is adherent after quenching.
Copper ⅛, powdered emery ¼, borax ¼ and silicate	Good protection	Difficult to use. The paint thickens rapidly. Coating very adherent after quenching.

It is seen that among the materials tried, as shown in the preceding table, two only are worthy of further use, namely, powdered emery and oxide of iron. The oxide of iron should be eliminated because the coating is only removed with great difficulty after the operation.

Other Mixtures With or Without Copper.—The results with other mixtures with or without copper are:

Composition	*Results*
Aluminum and silicate	Protection very imperfect.
Copper ⅝, aluminum ⅛ and silicate	Protection imperfect.
Copper ¼, aluminum ¼, powdered emery ½ and silicate	Protection imperfect.
Powdered emery and silicate	Bad protection.
Kaolin and silicate	The coating cracks or drops away from the steel.
Oxide of iron and silicate	The coating cracks or drops away from the steel.

From this last series of experiments the conclusion is drawn that, unfortunately, powdered aluminum cannot replace powdered copper. This is regrettable because of the lower price of aluminum. The results of the three last mixtures show that the presence of powdered copper in the coating is indispensable.

Conditions of Use of Copper-Emery-Silicate Paint.—Following the experiments outlined above the mixture decided upon was as follows:

Powdered copper	2 parts by weight
Powdered emery	1 part
Commercial solution of silicate of soda in sufficient quantity to give a thick paint.	

The coating obtained with this mixture is very adherent before heating and is easily removed from the steel after case hardening. The best method of preparing the paint is to mix the powdered copper and emery before use and just before applying to the steel adding the necessary amount of silicate of soda to give the desired consistency. The silicate is added little by little so as to make first a thick paste and then is brought to the necessary fluidity to flow freely from the brush. If while being used the mixture thickens a little more silicate is added.

Removal of Grease from the Steel.—Experience has shown that the paint will only protect properly if the parts are perfectly free from grease. Removing grease with a bath of hot potash solution is altogether insufficient, the mineral oils being only partially or not at all emulsified. The simplest and the most efficient method of removing grease seems to be to heat the samples in a furnace to about 500 deg. C. (932 deg. Fahr.), avoiding in all cases a red heat. From numerous tests made under these conditions carried out on several thousand pieces good results have always been obtained.

The question of finding the hard parts in the protected areas is made very simple after quenching. The

pieces, sand blasted with care, are immersed for one or two minutes in a copper reagent, similar to the Stead reagent. The parts not case hardened are strongly covered with copper, while the case-hardened parts are not affected. Further, this may be proved by means of a file or by a Brinell hardness test.

Application and Drying of the Coating.—A coating is required of about ½ or ¾ mm. thick, in order to protect against case hardening 1 mm. deep. When the paint is correctly applied drying takes about 15 min., and at the end of this time the pieces may be handled without danger. In every case the pieces may be placed in the boxes 1 hr. after being covered with the paint. Where there is need for speed or if a rapid drying is necessary on account of the shape of the piece (for instance, protection of salient angles) the paint may be applied to pieces previously heated to 70 to 90 deg. C. (158 to 194 deg. Fahr.); drying is then quite rapid and the pieces may be placed in the boxes 15 min. after.

Comparison of Price Compared with Electrolytical Copper Treatment.—If the simple cost of materials is considered the advantage is with the electrolytical method, but if it is remembered that painting with the silicate allows four times the number of pieces to be treated and does not require the expensive installation of baths, etc., the advantage is very clearly in favor of painting. It is very evident that the choice of one or the other method depends entirely on the kind of materials to be protected against case hardening. In the case of large pieces of which only a small part is to be case hardened the advantage is greatly with electrolysis.

II. Coating by Immersion in Copper Solution.

As is well known, iron displaces copper from a copper solution and produces a deposit of copper, the appearance and compactness of which differ according to the solution used. If an ordinary solution of copper chloride or copper sulphate in water is used the iron or steel is covered very rapidly with a powdery and a fragile deposit, which does not give any real protection against case hardening. If chloride of iron is added to ordinary copper chloride solutions in increasing quantity the deposit is produced much more slowly and is more adherent, according as the amount of chloride of iron is greater. In every case the most compact deposits detach in little scales if the action is prolonged long enough to give a thick coating. Ammoniacal chloride of copper solution (the Heyn reagent) gives a similar deposit that scales off when it reaches considerable thickness. The coating obtained with alcoholic solution, such as the Stead reagent, is continuous resistant and similar to an electrolytic coating. These methods were carefully tried out by covering the coating obtained with glue and solution of gum-arabic.

The results obtained were not better than from electrolytic coatings and like them required a preliminary covering with varnish on the parts to be afterwards case hardened. The only case where their use would seem to be indicated would be if one wished to protect the end of a piece by immersing the part to be protected in a dish or vat at a constant level. In this case the solution with chloride of iron and water or alcoholic solution would seem to be the best. G. B. W.

Civil service examinations are to be held by the United States Civil Service Commission, Washington, for an assistant examiner of the patent office, for an instructor in machine guns and armament at Raritan Arsenal, Metuchen, N. J., and for instructor in the ordnance department at Watertown Arsenal, Mass. Applicants should apply for form 1312, stating the title of the examination desired.

Construction of foundations for the new mechanical puddling plant at Warren, Ohio, to be erected by the Youngstown Steel Co., Youngstown, will commence during the next two weeks, and will be carried forward by the company's own organization. Excavation is virtually completed.

MALLEABLE CASTINGS

Great Improvement Made in Past Ten Years Described

The story of the great improvement in the quality of the malleable iron castings during the past few years is told in an interesting 32-page illustrated booklet entitled "Certified Malleable in Transportation and Industry," just issued by the American Malleable Castings Association, Cleveland. This recounts the results of the efforts of the association through its research department to improve malleable castings. It is asserted that less than 10 years ago there was little definiteness to the physical properties of the malleable iron and that there were virtually as many varieties as there were foundries making it. Co-operative efforts were started in 1913 by the 25 members of the association, which has since increased its membership to 50. Through these efforts, it is stated that the manufacture of malleable iron has been changed from a hit or miss proposition to a scientific basis.

When the research work was started, with a view of improving the physical properties of malleable iron, members were required to submit test bars daily. At that time the specifications of the American Society for Testing Materials for malleable iron called for a tensile strength of 38,000 lb. and 5 per cent elongation in 2 in., but this specification exceeded the product of many foundries. Through individual plant inspection the adoption of more successful practices and the regular submission of test bars, it was not long before a majority of the malleable foundries were making castings exceeding the A. S. T. M. specifications and subsequently at the solicitation of this association these specifications were raised to 45,000 lb. tensile strength and 7½ per cent elongation in 2 in., this specification being later adopted by the Society of Automotive Engineers. The association was inspired by its success to further improve its products and as a result a new specification of 50,000 lb. per sq. in. tensile strength and 10 per cent elongation has been adopted recently. It is pointed out that other desirable properties have shown even greater improvement. Experiments have been conducted to develop soundness, machining qualities and finish. The use of chills has given way to a proper proportioning of gates and risers, so that voids due to unequal cooling of the metal may be eliminated rather than driven to other parts. Scaled castings have been eliminated by the proper selection and treatment of packing materials and the proper protection of casting during annealing.

Rôle of the Microscope

The practice of issuing certificates of merit to foundries whose products meet the rigid requirements of the association, from which developed the term "Certified Malleable Castings," is described, as well as some of the manufacturing processes. The microscope is given credit for accomplishing much in bringing malleable castings to their present high standard of quality. It is stated that one of the most popular fallacies regarding malleable castings was the belief that the valuable properties of the casting is confined to its surface and that it has a tough outer skin with a hard brittle interior. It is pointed out that a study of the better malleable casting with the use of the microscope revealed that malleability was not due exclusively to the decarbonizing effect of the packing material, but rather to the breaking up of the hard carbides and the formation of ferrite or carbonless iron, the most ductile form of the metal, and that this was not confined to the outer layers, but extended to the center, thus substantiating the theory on which present day American practice is founded.

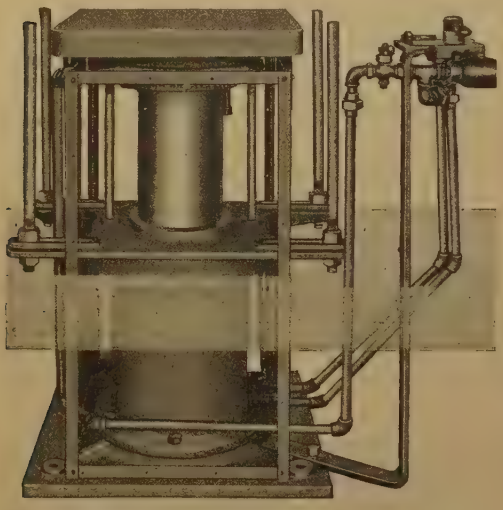
Comparisons are made of the physical and mechanical properties of malleable as compared with grey iron and steel castings, drop forgings and compressed steel and attention is called to the easy machining qualities of malleable iron. Numerous uses of malleable castings are listed and it is stated that from 200 to 250 lb. of malleable castings are now used in many of the best types of automobiles for various vital parts.

New Jolt Stripper Molding Machine

A new style jolt stripper of the type shown in the accompanying illustration has been added to the line of the Arcade Mfg. Co., Freeport, Ill.

The new machine has a 6-in. jolt cylinder and a 12-in. air strip. In this design the stripper frame, which carries the pins for engaging the stripping plate, or the flask when a stripping plate is not used, is mounted on a ring piston. The latter is guided around the jolt cylinder column and inside the cylinder shell at the bottom of the machine. For a 12-in. lift the ring piston is provided with an 18-in. bearing on the guide column, which is intended to assure perfectly vertical motion that will lift a flask with the sand from a pattern having the minimum of drag.

The 12-in. strip machine is placed with about half its height below the floor level, those with the 8-in.



Jolt Stripper Molding Machine. The stripper frame is mounted on a ring piston

strip being placed on top of the floor. The lifting pins, which engage the stripping plate or flask, are adjustable for flasks of different sizes. This equipment is made also with hand strip and with two lift cylinders for long flasks.

Papers for Steel Plant Electrical Engineers Convention

A tentative list of the papers to be presented at the sixteenth annual convention of the Association of Iron and Steel Electrical Engineers at Cleveland, Sept. 11 to 15 inclusive, is as follows:

"Improvement in Efficiency of Electric Power Supply" by Dr. Charles P. Steinmetz, chief consulting engineer General Electric Co., Schenectady, N. Y.

"A Review of Steel Mill Electrification" by B. G. Lamme, chief consulting engineer Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and Wilfred Sykes, assistant to operating vice-president Steel & Tube Co. of America, Chicago.

"Judging Combustion from Gas Analysis" by A. G. Witting, assistant chief engineer Illinois Steel Co., Gary, Ind.

"Electrification of the International Nickel Company's Works for Monel Metal" by F. C. Watson, electrical superintendent International Nickel Co., Huntington, W. Va.

"The Gas Engine as a Prime Mover for Power Generation" by D. M. Petty, electrical superintendent Lehigh plant, Bethlehem Steel Co., South Bethlehem, Pa.

"Steam Turbines" by L. W. Heller, assistant superintendent power stations Duquesne Light Co., Pittsburgh.

"Some Considerations in the Electrification of the Steel Plant Railroad Yard" by R. B. Gerhardt, electrical superintendent Bethlehem Steel Co., Sparrows Point, Md.

"Power in the Iron and Steel Industry" by D. B. Rushmore, consulting engineer General Electric Co., Schenectady, N. Y.

"Boiler Practices of 1922," a topical discussion by J. B. Crane, combustion engineer George T. Ladd Co.; E. R. Fish, vice-president Heine Boiler Co.; R. M. Rush, Springfield Boiler Co.; R. E. Butler, Babcock & Wilcox Co.; F. Hodson, Electric Furnace Construction Co.; Professor Edgar Kidwell, general manager Kidwell Boiler & Engineering Co.

"Control Standardization" by F. W. Cramer, engineer of tests Cambria Steel Co., Johnstown, Pa.

"Motor Standardization" by D. M. Petty.

"Investigation of Insulators for Steel Mill Service" by A. R. Leavitt, engineer of tests Carnegie Steel Co., Duquesne, Pa.

"Electric Furnaces" by E. T. Moore, electrical engineer Halcomb Steel Co., Syracuse, N. Y.

"Lighting in Steel Plants" by R. H. Bauer, electrical engineer Carnegie Steel Co., Clairton, Pa.

"The Question of Safety in Steel Mills" by F. A. Wiley, electrical superintendent Wisconsin Steel Co., Chicago.

"Education" by L. F. Galbraith, electrical superintendent West Penn Steel Co., Brackenridge, Pa.

"Electrical Developments in 1922" by R. B. Gerhardt.

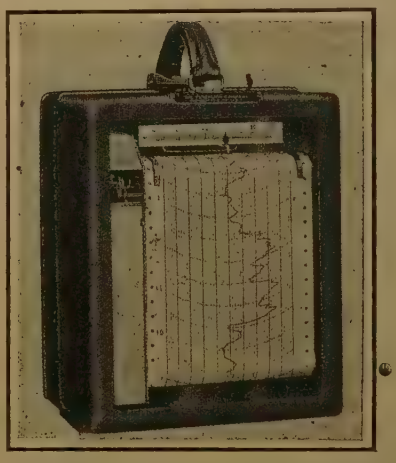
"Crane Standardization" by R. S. Shoemaker, superintendent of maintenance American Rolling Mills Co., Middletown, Ohio, W. S. Hall and E. Friedlaender.

Combination A. C. and D. C. Voltmeter

A graphic voltmeter known as the Utility and said to be equally accurate on all commercial frequencies of alternating current and direct current as well, has been brought out by the Esterline-Angus Co., Indianapolis.

The meter, shown in the accompanying illustration, is made of the portable type, the case being of aluminum, finished in hand-rubbed, baked enamel. The clock provided is an 8-day marine type, inclosed in a separate case, and five hourly chart speeds, ¾, 1½, 3, 6 and 12 in. per hour are obtainable. The clock can also be fitted to give additional hourly chart speeds, and the same speed for inches per minute as well. The chart is 6 in. wide and 90 ft. long.

The measuring element incorporates unique features, a molded bakelite frame being used to give high insulation and accurate assembly. The moving system, instead of being mounted on a staff carried by pivots



Voltmeter for Both Alternating and Direct Current Service

and jewels, is supported on a taut steel suspension wire. This arrangement is intended to eliminate friction and make the instrument really portable, because the suspension is not affected by shocks, jars and vibration. The ink well and the damper are molded integrally with the frame, and constructed to eliminate spilling of the ink with ordinary handling.

The instruments are available in the following ranges: 0-150; 0-300; 0-600 and 0-750, and can be furnished with combinations of two, three or all four of the ranges given.

The Kilby Mfg. Co., which recently resumed the operation of its foundry in Cleveland on an open shop basis, has brought suit asking for a restraining order against members of the union to prevent them from picketing its plant.

Electrical and Magnetic Weld Testing*

Their Application to Butt-Welded Steel Plates—Comparison With Physical Tests—Commercial Possibilities of Magnetic Testing

BY T. SPOONER AND I. F. KINNARD

IN spite of the very rapid progress made in recent years in the application of arc and gas welding, this progress would have been more rapid if at the same time there had been developed a reliable and simple method of determining the quality of welded joints. Provided plenty of reliable and competent operators are available, it is well known that many important structures such as large tanks, steel ships, boilers and perhaps the steel frameworks of bridges and buildings could be safely joined together by welding alone. However, since the results are always in doubt where the human element enters in and since visual inspection alone will not reveal the presence of slag inclusions, incomplete fusion of metal, etc., the applications of welding methods have been greatly retarded for important structures where reliability is essential.

There are various possible methods of inspection available such as X-ray analysis, acoustical methods,

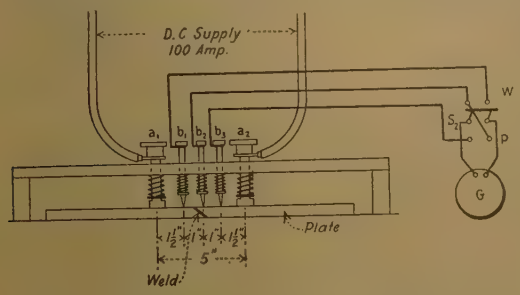


Fig. 1.—Diagram of Apparatus for Electrical Tests of Butt-Welded Joints of Steel

electrical tests, magnetic tests, etc. This paper will describe some preliminary laboratory tests to determine the possibility of applying electrical and magnetic methods for testing the quality of butt welds joining steel plates. These preliminary tests were merely to determine whether or not such methods showed promise of ultimate success and not to develop commercial testing apparatus.

Samples

Four pairs of steel plates having the following dimensions were butt-welded by an experienced operator:

Plate	Thickness, In.	Length of Weld, In.
A	1/4	16
B	1/4	24
C	1/2	24
D	1/2	24

The joints were made according to a predetermined schedule and were designated by the welder as good, fair and poor, over various sections as will be noted later.

Methods of Test

The method of application was similar for the electrical and magnetic methods of test and consisted in measuring the electrical or magnetic potential drop across the weld with a definite e.m.f. or magnetic potential applied on opposite sides of the weld. This drop was compared with the drop over an equal length of unwelded plate. The e.m.f. or magnetic potential was applied at points fairly close to the weld in order to localize the effect. If the e.m.f., for instance, had been applied at the edges of the plate parallel to the weld, the current would have distributed itself inversely as the resistivity and the potential drop across the various portions of the weld would have been nearly the same regardless of the quality.

Electrical Tests.—The apparatus constructed to make use of the electric current for weld testing is shown in Fig. 1. The current, in this case 100 amperes direct current, was passed into the plate through two heavy brass posts a_1 and a_2. A galvanometer was connected through the switch S_2 to either b_1-b_2 which was across the weld, or to b_2-b_3 which was across an equal distance on the plate. Consequently, readings could be readily obtained for any point in the weld which indicated the difference, if any, between the weld and plate at that point. In general the weld had a higher resistance than the plate and consequently the potential drop was greater for the former. The difference between the above readings expressed as a percentage of the plate readings represents the percentage decrease in the quality of the weld based on the plate. The quality of the weld is expressed as 100 minus the percentage decrease as just defined.

The scale was first removed from the plate over the portion to be tested. The plate was then marked off into 1-in. strips and readings were taken at the center of each strip. In all cases these readings were repeated several times and it was found that reasonable checks could be obtained.

Magnetic Tests.—A magnetic tester was designed incorporating the same general principles utilized in the electrical method. Fig. 2 shows the general arrangement. A method of measuring magnetic potential drop was originally described by Chattock in England and was later used by Rogowski in Germany. A modification of the general principle, due to Fahy and incorporated in his Simplex permeameter, was used

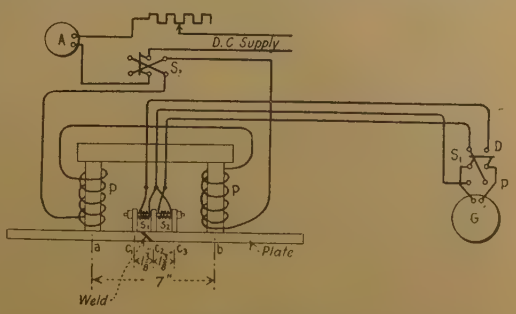


Fig. 2.—Diagram of Apparatus for Magnetic Tests of Butt-Welded Joints of Steel

in our tests. Fig. 2 shows the general arrangement of the apparatus and connections. In this case the soft iron posts c_1, c_2 and c_3 were used as potential contacts and the drop in magnetic potential across the weld and plate respectively was obtained ballistically by means of the air coils s_1 and s_2 which were connected to a ballistic galvanometer. The set-up was arranged so that when switch S_1 was in position D the coils were connected differentially, and when in position P the coil across the plate only was connected to the galvanometer. Only sufficient exciting current was used to induce a flux in the plate at about the value of maximum permeability, as it was found for instance that 0.5 ampere worked better than 2 amperes.

After experimenting it was found that for the most consistent results it was necessary to raise the poten-

*From a paper delivered at the annual convention of the American Society for Testing Materials at Atlantic City, N. J., June 26 to 29. The authors are research engineers, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

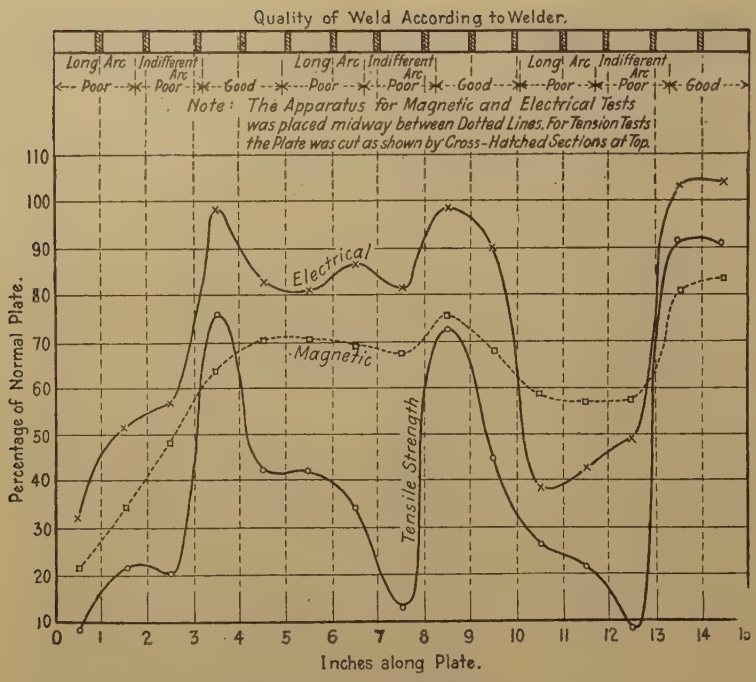

Quality of Weld According to Welder.
Long Arc
Indifferent Arc
Poor
Good
Note: The Apparatus for Magnetic and Electrical Tests was placed midway between Dotted Lines. For Tension Tests the Plate was cut as shown by Cross-Hatched Sections at Top.
Electrical
Magnetic
Tensile Strength
Percentage of Normal Plate.
Inches along Plate.

Fig. 3.—Plotted Results of Electrical, Magnetic and Tension Tests, Plate A

tial contacts from the plate a slight distance with some non-magnetic material. This was done to equalize the effects of scale and non-uniform contacts. Due to the fact that, in some cases, the plates were badly bent and twisted, better results were also obtained by rounding the main contacts at *a* and *b*. It is necessary for proper functioning that the potential posts c_1, c_2 and c_3 be symmetrically spaced in respect to each other and to the magnet cores *a* and *b*.

In the magnetic test, readings were taken along the plate at 1-in. intervals as in the electrical tests. The quality of the weld is expressed as in the electrical tests.

Tension Tests.—After completing the electrical and magnetic tests, the plates were cut into 1-in. strips at right angles to the weld and the tensile strength of the strips determined. The cross-section was taken equal to that of the normal plate outside the weld. In most cases rupture occurred within the weld, but in a few instances the strip broke outside, showing that the weld was stronger than the plate. In all cases an average value was obtained for the strength of material in the plate so that the strength of the weld could be expressed as a percentage of that of the plate.

Test Results

The electrical and magnetic test results for the various plates, together with the quality as reported by the welder, are shown in Figs. 3 to 6. The electrical and magnetic testing apparatus was located midway between each pair of vertical dotted lines as indicated by the test points. For the tensile tests the plates were supposed to have been cut along the dotted lines. The machining was not accurately done, however, as indicated by the cross-hatched portions at the top of the figures which show the actual cutting positions. The results shown for the electrical and magnetic tests represent data obtained after a good many trials and check runs which were in some cases made on both sides of the plate. A weld equal in quality to the plate is represented as 100 per cent. For points below the 100 per cent line, the weld is poorer than the plate and above, better.

Discussion of Results

Before considering the results on each plate in detail the following points may be noted. In comparing the electrical and magnetic tests with tensile strength we must make allowance for the fact that the latter tests were made on isolated strips and represent absolute values, while in the former tests adjacent strips have an influence on the value read. Although this does not prevent the electrical or magnetic testing from showing up isolated bad spots, it may modify them or slightly displace their apparent position since the measurements could not be completely localized. If a good and bad spot are adjacent, the electrical and magnetic tests will give a more or less mean value, whereas the tension test, which is the absolute test value for one inch, is not of course influenced by the adjacent material, since this material has been removed. Moreover, the tension tests tend to be too low as compared with the quality of the completed weld for two reasons:

1. In many cases the two plates welded were no longer in the same plane due to shrinkage caused by unequal cooling and therefore tension tests produced bending strains as well as normal strains; and

2. If a small slag inclusion or other weak spot was present near the edge of a strip it would tend to spread on pulling, thus reducing the strength of the strips below that to be expected of the completed weld.

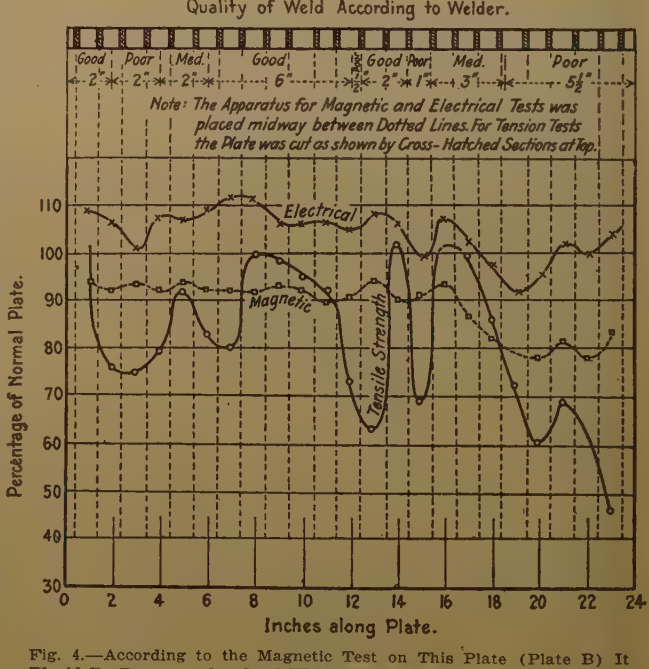

Quality of Weld According to Welder.
Good
Poor
Med.
Note: The Apparatus for Magnetic and Electrical Tests was placed midway between Dotted Lines. For Tension Tests the Plate was cut as shown by Cross-Hatched Sections at Top.
Electrical
Magnetic
Tensile Strength
Percentage of Normal Plate.
Inches along Plate.

Fig. 4.—According to the Magnetic Test on This Plate (Plate B) It Would Be Pronounced a Good Weld with the Exception of the End, 18 to 24 In. There are evidently some isolated bad spots at some other points, but these are not sufficiently bad to have much effect on the magnetic data. The electrical test in general shows much the same results as the magnetic. In general we would say that this was the best plate of the four, but that the detail of variations was not brought out very well by either of the two tests

It is probable, then, that the tension tests represent a worse condition than actually existed. Moreover, it is quite possible that the electrical and magnetic results more nearly represent the true quality of the weld as a whole, although they probably indicate a weld quality somewhat superior to the actual quality.

Plate A.—This plate was tested a large number of times by both methods. As shown by the curves (Fig. 3) the electrical test follows the tensile strength more closely than the magnetic test does. The latter, though, indicates that the weld is very bad in almost every part. The bad region between the 5 and 8-in. points is somewhat slighted by both tests, although it is not shown as "good" by either one. The good spot between the 3 and 4-in. points is shown by the electrical test but not by the magnetic. It is probable that an isolated good spot will not be picked out by the magnetic test, but the results seem to show that isolated bad spots are readily located, which is presumably more important. It will be well to call attention to the fact that in testing this plate the magnetic tester had not been developed to the working efficiency that was reached later. Therefore, there is a possibility that the poor 5 to 8-in. section would have been better detected had it been tested under the later conditions of test. This plate had the poorest welding of the four, which is shown by all the tests.

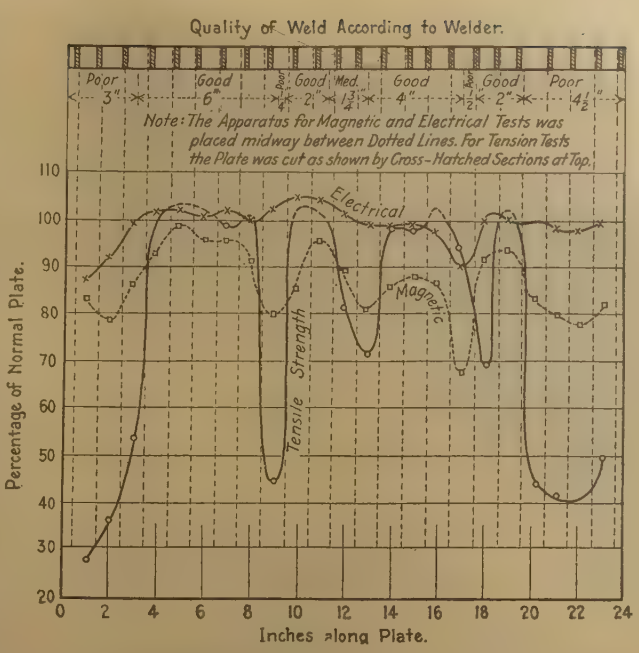

Quality of Weld According to Welder.
Poor 3"
Good 6"
Med. 2"
Good 2¼"
Med. 1¾"
Good 4"
Good 2"
Poor 4½"
Note: The Apparatus for Magnetic and Electrical Tests was placed midway between Dotted Lines. For Tension Tests the Plate was cut as shown by Cross-Hatched Sections at Top.
Electrical
Magnetic
Tensile Strength
Percentage of Normal Plate.
Inches along Plate.

Fig. 5.—The Magnetic Test on Plate C Seems to Follow the Tensile Strength Remarkably Well, Although the Magnitude of the Percentages Are Somewhat Different, as Would Be Expected. The strip at 17 in. shows a bad spot magnetically, while in the tension test this bad spot seemed to be located at 18 in. However, according to the data on the original welding there was a bad spot located at 17 in. and it is probable that it extended into the 18-in. region. On account of the adjacent good weld at 19 in. the effect of the bad spot was more prominent at 17 than at 18 in. The electrical test on this plate was not so successful and shows a uniformly good plate with the exception of the strip at 17 in. and the section from 1 to 3 in.

Conclusions

1. It would seem that the foregoing tests will pick out faults in welds irrespective of what type they may be. For instance, it was brought out by an examination of the test strips that a small cross-section at the weld shows up magnetically. On the other hand if there is a surplus of metal at the weld and part of it poor, this condition is detected.

2. From the experimental work here reported it seems that the magnetic methods give the more consistent results.

3. For butt-welding it is quite feasible to definitely state from the magnetic test whether a weld is good, fair or poor when the results are properly interpreted.

4. While the electrical or magnetic tests do not detect small isolated bad spots with certainty, a fairly poor weld extending over considerable distance will be indicated without the slightest possibility of doubt.

5. It is apparent that the tension tests indicate much poorer quality of welds than the magnetic or electrical. However, from considerations mentioned above we believe that the tension tests indicate a poorer quality than actually exists, while the electrical and magnetic tests show more nearly the average quality.

6. All of the welds with the exception of plate A, Fig. 3, would be considered good average welds. For this plate, the tension, magnetic and electrical tests all agree that this is a poor weld.

7. It should be possible to readily devise a simple and portable apparatus for applying these methods, especially the magnetic, for commercial weld testing. The magnetic method should be more readily applicable since actual metallic contact between the testing apparatus and plate is not essential.

8. These results open up a line of approach to weld testing in general. It remains to be seen whether the foregoing methods can be successfully applied to lap-welded joints and other untried forms. The application to butt welding alone should be quite important to any industry that utilizes this type of weld extensively.

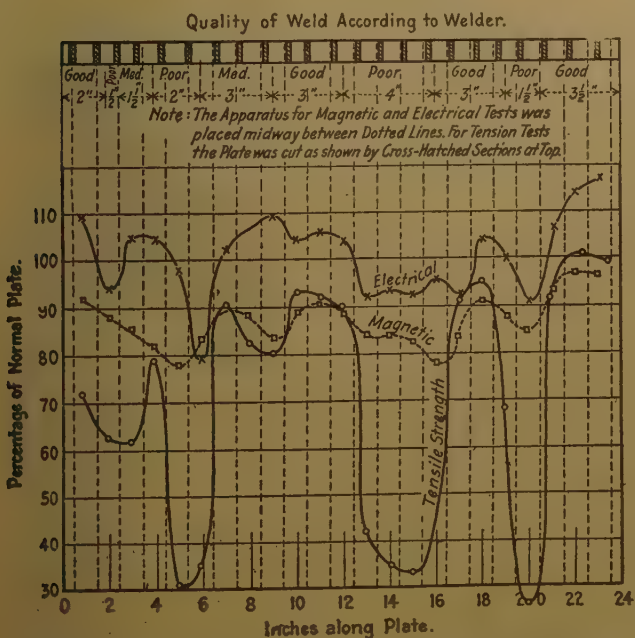


Fig. 6.—Again in This Plate (Plate D) the Magnetic Test Follows the Shape of the Tensile Strength Curve Quite Closely. The electrical test also shows quite good results, although the latter is displaced above the 100 per cent line too much. The bad spots in the plate are quite definitely picked out by both tests

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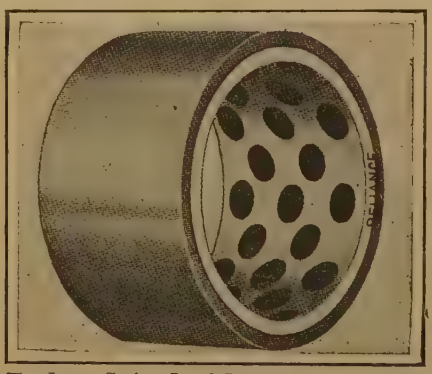
A. L. Flint, general purchasing officer, the Panama Canal, Washington, will receive bids until July 25, for a quantity of metals and miscellaneous equipment.

Self-Lubricating Bushings

Self-lubricating bushings and bearings for use where oiled bearings are objectionable, inaccessible, or likely to be forgotten, and recommended for use because of the comparatively lower cost and their durability, are being offered by the Union Machine Co., Fitchburg, Mass.

The bushing is shown in the accompanying illustration. It is designated as the Reliance and is made up of two parts, an inner casing of bronze and an outer casing of steel tubing machined to standard sizes for a driving or pressing fit. The method of manufacture is said to be a departure from the usual practice and involve fewer manufacturing operations, the bushings being machined, filled and burnished without being split. If required the outer casing may be of bronze or of steel, tinned to prevent rusting.

Holes that contain the lubricant are ¼ in. for all sizes of bushing, which is intended to assure a large lubricating surface irrespective of the dimensions of wearing parts. The shaft or pin holes in the bushings for sheave and block work are larger than listed sizes to allow for running tolerance. The bushings are made with the requisite allowance for a driving fit into the



The Inner Casing Is of Bronze and the Outer of Steel Tubing. The bushings are machined, filled and burnished without being split

holes bored to the exact size usually given as the outside diameter of the bushings. They are available in any length and with any special inside or outside diameters required, also flange bushings of all standard sizes.

The inner casing wall is 3/32 in. Instead of straight, tapered holes are bored, these being slightly larger on the outside than the inside, which is intended to furnish a grip for the lubricant mixture and eliminate possibility of its dropping from place. The nature of the inner casing and the patented process used is said to permit of great compression in placing the lubricant plugs, the plugs being made directly inside the hole and under great pressure. In the event of the lubricant wearing below the point of usefulness a new inner casing can be inserted. The thickness of the outer casing can be made to meet requirements, and bushings can be furnished without outer casings.

A test shaft 1 in. in diameter with bearings 5 in. long, is said to have been run continuously for 150 hours at a speed of 4700 r.p.m., the bushings being after the test in practically the same condition as when started.

British Empire Steel Corporation Additions

In connection with the additions to be made to the plant of the British Empire Steel Corporation, Sydney, N. S., to cost $19,000,000, it is stated that the company's engineers are now preparing plans for new open hearths and a blooming mill which will cost about $10,000,000. One blast furnace is to be rebuilt and another extensively repaired, while a number of other additions and improvements will also be made to the plant. It is reported that the money to pay for these improvements is to come from a large loan to be made to the British Empire Steel Corporation by two large American financial houses, the negotiations for the loan being nearly completed.

According to information furnished by the head office of the British Empire Steel Corporation, at Montreal Que., one open-hearth furnace at the Sydney, N. S., plant was blown in on July 10. This company's business has been improving for the past three months, and everything points to continued improvement. It is also stated that the company's pay roll amounts to $10,000 per day, this being the first time since November, 1920, that the payroll has reached this amount.

Lectures on Geology of Commerce and Industry

A series of evening lectures on the geology of commerce and industry has been announced by New York University. They will be given at the Washington Square division of the school of commerce by Ernest R. Lilley, consulting geologist and mineral economist, and lecturer on economic geology. The fall term will cover commercial geology of the fuels, chemicals, and building materials. The spring term will treat of the problems of the metal industries. The subjects include the mining and preparation of iron and steel; world problems in iron ore conservation and utilization; the major alloy bases, manganese, chromium; economics of the minor alloy ores, tungsten, molybdenum, vanadium; process materials of the metal industries, including refractories and abrasives; non-ferrous metals. The lectures will be given at the Washington Square Building, New York University, on Wednesdays from 8 to 9.45 p. m. beginning Sept. 27, 1922. For information the secretary of school of commerce should be addressed at Washington Square, New York.

Electric Space Heater for Various Uses

An electric device called a space heater and having a wide field of application, has been placed on the market by the Westinghouse Electric & Mfg. Co., East Pittsburgh. It is adaptable to heating metal, water tanks, baking and drying ovens, drying of foundry molds, warming crane cabs, and in other uses where the temperature required does not exceed 800 deg. Fahr. The device is available in many sizes and in several wattages and voltages.

Ease of application, adaptability to any heating pur-

Electric Space Heater for Use Where the Temperature Required Does Not Exceed 800 Deg. Fahr. Electrical connections are insulated from the supports

pose, rugged construction, convenient lengths and durbility of the heating element are said to make the heater particularly useful for industrial applications.

The heater shown in the illustration is made up of a sheet-steel outer casing which forms the sheath and also has the supporting holes. The back is flat and the terminals project from one side only, the terminal supports being permanently attached to the casing. Electrical connections are insulated from the supports, which adapts the heater for attachment directly to plates, tanks and other metals without the danger of short circuiting or grounding the terminals.

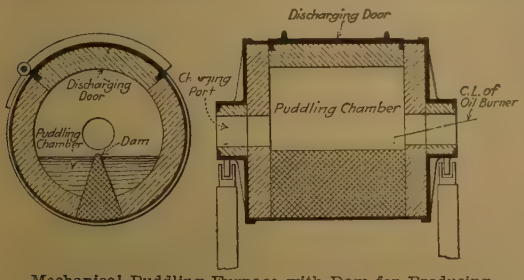
For general air heating purposes, such as warming of isolated rooms, booths, etc., the heaters may be fastened on angle iron frames and protected by screening. For heating metal tanks, pipes, etc., the device is fastened against the surface and insulated.

New Process for Mechanical Puddling

Commercial Installation at the Titan Works Consisting of Cupola and Ten Furnaces—Repeated Pourings Over a Dam the Unique Principle of the New Method

HAVING demonstrated, through an experimental outfit, that mechanically puddled wrought iron is a commercial possibility, the Titan Iron & Steel Co., Inc., Newark, N. J., is about to install a complete unit consisting of a large cupola, ten mechanical puddling furnaces and a mechanical squeezer for handling the large balls. One of the furnaces is already in position and the squeezer is also in commission. In connection with the new equipment will be a roll train for breaking down the puddled bar into billets and a finishing train for the production, from the billets, of merchant bars and skelp and various types of rods. The whole will be installed in the company's plant in Newark.

Two or three hundred heats of iron have already been made in the experimental furnace, with results reported as exceptionally good. The four photomicrographs shown are taken from some of the iron produced by this process. These photomicrographs were made by Prof. Albert Sauveur, of Harvard University, all being magnified 100 diameters and then reduced one-half in reproduction.



Mechanical Puddling Furnace with Dam for Producing Intimate Mixture and Homogeneous Iron. The molten pig iron is introduced through the hollow trunnion at left and the fuel oil through that at right. Products of combustion pass out through the charging port at left. When the ball is ready, the door at top is opened and the ball drops out

The unique principle of the process, which is the invention of Henry D. Hibbard, is in making a charge of molten iron and oxide of iron pour repeatedly over a dam. An intimate mixture of the two ensues, with a rapid change of the iron to the wrought state. The presence of this dam causes the material to spill over the top in a thin stream as the furnace is oscillated back and forth in operation. This makes for thorough mechanical mixing and goes far to explain the homogeneity reported in the product.

The melting stage is carried on in a cupola, as considerably less expensive than melting in the puddling furnace. Molten iron goes into the furnace through one hollow trunnion (the oil fuel is introduced through the other trunnion) and the purifying, boiling and balling stages take place within the furnace. In all three of these the operation, mechanically, follows the hand method, both in the chemical and physical aspects. The carbon is removed, just as in the hand method, during the boiling process, while in the balling process the plastic grains unite and form the sponge. A mixture of gray forge pig iron and scale is used. The chemical reactions, which eliminate practically all the nonferrous ingredients of the crude iron and change it into wrought iron, are these:

The silicon is wholly oxidized and enters the slag as silicic acid (SiO_2).

The manganese is wholly oxidized and enters the slag as oxide (MnO).

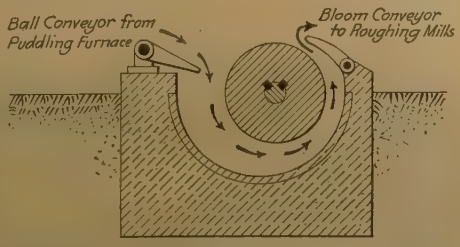
The phosphorus is oxidized to the extent of 80 to 90 per cent, and enters the slag as phosphoric acid (P_2O_5).

The sulphur to the extent of 70 to 90 per cent leaves the iron and enters the slag probably as sulphide of manganese or sulphide of iron.

The carbon is almost wholly oxidized and leaves the metal as carbonic oxide gas (CO) with less than 0.10 per cent of carbon remaining in the rolled bar.

Essentially, the furnace consists of a cylinder of steel plate about 6 ft. in diameter and 5 ft. 6 in. long, with projecting trunnions 18 in. in diameter. The cylinder is lined with magnesite brick to an inside diameter of about 4 ft. The dam, which consists also of magnesite brick, extends up nearly to the center line. On the surface of the brick a skim of iron is sintered to perhaps ½ in. As this protects the brick both from mechanical damage and from the action of the hot metal, the refractory situation is reported as not causing trouble. The operation is carried on at a temperature of about 2650 deg. Fahr., the flame being 2850 deg. As soon as the iron "comes to nature" and begins to form into a ball, the oscillating motion of the furnace is stopped and it is rotated clear over. Eventually the door, which normally is at the top of the furnace, is opened, and out of this door the balls drop upon a conveyor.

From the conveyor the ball is carried to the squeezer (which was designed in the plant and built by contract) where it goes down through a passage of continually decreasing dimension and whence it is expelled in rough cylindrical form at the far side, freed from surplus slag, and prepared for the breaking down rolls. The squeezer is made of steel castings, the rotating corrugated drum having a diameter of approximately 4 ft. So long as the corrugations hold their shape, it is felt that no need will exist for special projecting points to carry the ball through the machine.



Rotary Squeezer for Converting the Puddled Ball into a Bloom for the Roughing Rolls. The arrows show course of ball. The axis of the corrugated drum is horizontal

Arrangements have been made, however, so that these points may be fitted as needed.

Each puddling furnace has a capacity of 1200 lb. or more per heat. The largest heat which has been taken out weighed 1340 lb. It is claimed that this particular ball is the heaviest which has ever passed through a squeezer. The one squeezer will do for the ten furnaces, because the ball is in the squeezer only about 45 sec. The squeezer is operated by an electric motor of 250 hp., but this is reported to be about double the actual requirements. The motor is geared into an intermediate shaft carrying a flywheel; from this shaft spur gearing further reduces the speed for the squeezer roll. Thus there is a double reduction from the speed of the motor to that of the squeezer.

Some of the physical and chemical results obtained from this iron are shown in the table. The iron is used largely for pipe and sockets, for engine bolts, stay bolts and high grade merchant bar. It is reported that

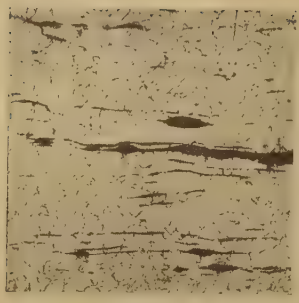


Fig. 1

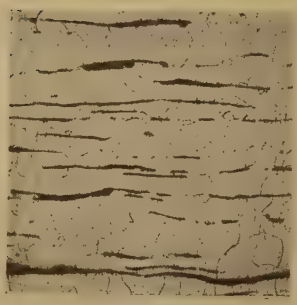


Fig. 2

Fig. 3

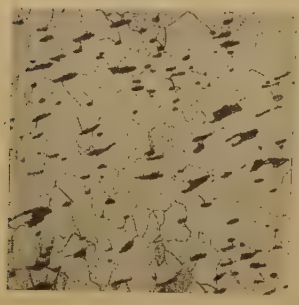


Fig. 4

Photomicrographs of Mechanically Puddled Wrought Iron. Figs. 1 and 2 are longitudinal sections; Figs. 3 and 4 are cross sections. All magnified 100 diameters, and reduced one-half

the chemical analysis presents great uniformity from one heat to another.

	Pipe and Socket Iron	Stay Bolts and Merchant Bar
Carbon, per cent.....	0.022	0.030
Manganese, per cent.....	0.031	0.022
Silicon, per cent.....	0.220	0.200
Phosphorus, per cent....	0.128	0.042
Sulphur, per cent.....	0.025	0.013
Tensile strength, from...	45,000 lb.	48,000 lb.
to.....	50,000 lb.	52,000 lb.
Yield point, from.....	25,000 lb.	26,000 lb.
to.....	30,000 lb.	32,000 lb.
Elongation, per cent (in 8 in.)	15 to 20	25 to 30

The building in which the operations are now carried on includes three bays about 50 x 400 ft., equipped with electric cranes, and one area about 200 ft. square without cranes. One bay contains four open-hearth furnaces, three being stationary 30-ton units, while the other is a tilting furnace of about 25 tons capacity. These furnaces, not now in use, are reserved for possible future operation. The new cupola, of continuous type, will have a 72-in. diameter shell, but will be lined at first to 60 in. diameter. It will be located alongside the open-hearth charging platform and will be charged from that platform, as are the two small cupolas now in use.

It is expected that the new cupola and ten furnaces will be in position by the middle of September, giving a capacity of about 5000 tons per month. The plant is to be extended next year to a capacity of about 7500 tons per month, which is regarded as the maximum for the present buildings and land area. It is planned to install later a still larger plant somewhere west of the Allegheny mountains, taking advantage of proximity to blast furnace iron in that district.

The Hibbard process, which was originally contrived for refining or washing crude iron, is patented throughout the world. Several additional patents have been applied for and are pending and negotiations are in progress for the establishment of the process in nearly all iron-making countries. The Hibbard Process Corporation, 71 Broadway, New York, has been organized, of which Henry D. Hibbard is president, Charles F. Rand, vice-president and C. Ames Brooks, secretary and treasurer.

Robert E. Jennings, 2nd., formerly vice-president

Mechanical Puddler in Operation in Middle Distance, with Flame Issuing from Charging Port at Right. Farther to right is the charging spout for cupola iron. In foreground is the rotary squeezer which compresses the puddled ball into a rough cylinder for passage through the breaking down rolls

and general manager of the Hewitt Steel Corporation, is president of the Titan Iron & Steel Co., Inc. W. W. Williams, vice-president, was formerly general manager of the A. M. Byers Co. and vice-president and general manager of the Reading Iron Co. Louis M. Atha is treasurer. E. F. Blessing, works manager, was formerly chief metallurgist of the Reading Iron Co.

SHIPBUILDING SHOWS DECLINE

Production of Ships Throughout the World Now Below Pre-War Level

World shipbuilding to-day is actually below the pre-war level, says a statement by Lloyd's Register of Shipping. The decrease in production has been steady since the fall of 1919, and the volume of new orders continues to be far below the completion of orders in hand.

While the returns for the quarter ended July 1 show that the aggregate of contracts in hand is nearly 800,000 gross tons more than the total at July 1, 1914, so many suspensions of work have been directed by those who placed the orders that the actual volume of construction actively under way is slightly below the pre-war figure. On April 1 the American aggregate was lower than before the war, but on July 1 it was slightly above the pre-war figure. This country, however, was practically the only one in the world to show a gain during the past quarter.

The gross aggregate of tonnage on July 1, as compared with the previous quarter, was as follows (in gross tons):

	July 1	April 1
United States	150,623	136,266
United Kingdom	1,919,504	2,235,998
Other countries	1,165,303	1,307,358
World total	3,235,430	3,679,622

British Work Drops Off

Stoppages ordered on this work fell more heavily on British shipyards than on those of all the other maritime nations combined, says Lloyd's Register, the result being that, while the actual British total is nearly 300,000 tons below the pre-war figure, the aggregate of the other shipbuilding countries is about 250,000 tons higher than in 1914. The following shows the result of the last quarter's suspensions, in gross tons:

	Britain	Others
Work contracted	1,919,504	1,315,926
Less suspensions	481,000	290,000
Actual work	1,438,504	1,025,926

The actual construction under way at present, as compared with that just before the war, shows how British shipyards have been affected:

	July 1, 1914	July 1, 1922
United Kingdom	1,722,000	1,438,504
United States	148,000	150,623
Other countries	626,000	875,303
World total	2,496,000	2,464,430

The world construction now actually under way shows a decline of nearly 5,600,000 gross tons from the peak, which was attained in September, 1919, when 8,048,000 tons were being built. This country's present total of 150,000 tons, compared with the high level of 4,186,000 tons reached in the first quarter of 1919, shows a decrease of more than 95 per cent. It is interesting to note that the relative proportions of the world's shipbuilding have changed considerably since the pre-war period. Great Britain, which then had 69 per cent of the total, now has only 58 per cent; the United States has still its 6 per cent as in 1914, and the other countries have increased their share from 25 per cent to 36 per cent.

Returns from all countries of the construction being done under the supervision of Lloyd's Register and intended to be classed with that society, show a total of 2,010,912 gross tons, of which 1,470,977 tons represent orders placed in Great Britain.

The total of work now under way in German shipyards is estimated by Lloyd's Register to be 500,000 gross tons, or over 200,000 tons more than for any other country in the world except Great Britain. Danzig is reported to be building 45,000 tons of merchant ships.

Of the smaller shipbuilding countries, Italy, France and Holland still retain their lead, in the order named. All, however, show declines from their figures for the quarter ended April 1. Of the smaller ship-producing nations, it is to be noted that Japan shows the least decline, her decrease being only 1800 tons from the April figure.

Proposed Iron and Steel Freight Rates Suspended

WASHINGTON, July 18.—The Interstate Commerce Commission last Saturday entered an order suspending from July 15 until Nov. 12, unless otherwise ordered, the operation of the tariff supplement establishing a proportional rate of 20c. per 100 lb. on iron and steel articles in carloads from New Orleans, Baton Rouge, and Anchorage, La., to the Galveston, Houston, Beaumont and Orange groups in Texas. In the meantime a hearing on the proposed reduction in the rate will be held. This case has created considerable interest in the iron and steel trade, as well as among the affected railroads, as pointed out in THE IRON AGE of last week, page 96. Chicago and St. Louis steel makers oppose the proposed proportional rate of 20c., while steel producers in the Pittsburgh and surrounding districts had asked the commission to allow the rate to become effective on July 15, as proposed by Agent Leland, who filed the tariff, on behalf of southwestern rail lines.

The following table illustrates the proposed changes:

Rates are in cents per 100 lb.

From New Orleans to	On Bars, Angles and Fence Material		On Pipe and Fittings	
	Present	Proposed	Present	Proposed
Galveston, Tex...	57.5	*20	33	*20
Houston, Tex....		†38		†33

*Applies only on traffic originating beyond other than import traffic. †Applies on local traffic.

Large Magnesite Deposit in Southern Nevada

A massive deposit of magnesite of unusual character that has recently been brought to the attention of the U. S. Geological Survey promises to yield a large and readily available supply. The deposit lies in Clark county, Nev., a few miles above St. Thomas. The material has been known for some time as kaolin, and successful experiments for utilizing it as a porcelain clay are reported to have been made, though they have not yet resulted in the exploitation of the deposit.

The so-called kaolin is stated by the geological survey to be in fact a magnesite. The material is porcelain-white, fine grained, and massive, is remarkably free from foreign material, and has the structureless appearance and conchoidal fracture that are generally characteristic of magnesite. It is not so hard as the more typical magnesite, and it crumbles more rapidly on exposure to the weather. Unlike most other deposits of magnesite in California and elsewhere in this country, this is not a vein deposit, such as occurs with serpentine, but resembles closely the deposits discovered in 1911 at Bissell siding, near Mojave, Cal. The deposit at Bissell, however, does not appear to be so large or regular as the deposit on Muddy River.

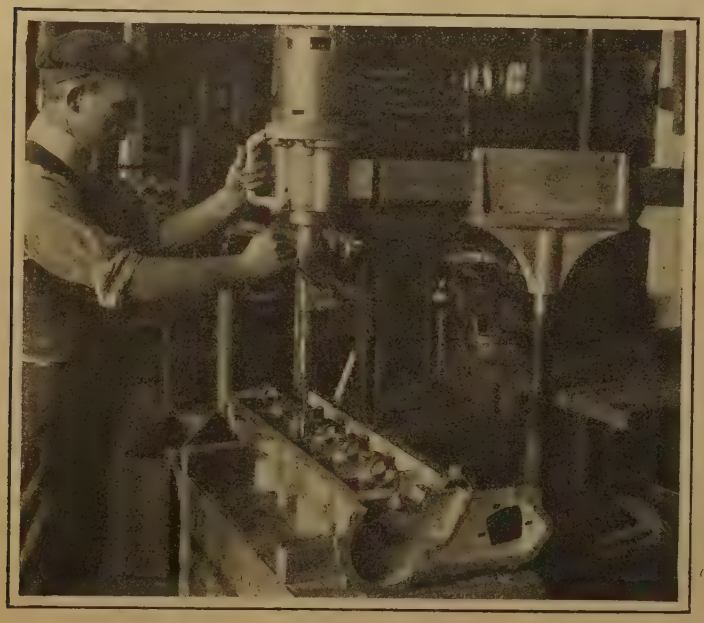
Sales of leather belting in the week ending July 1, as reported by the Leather Belting Exchange, representing about 60 per cent of the total product, were 105,168 lb., valued at $167,532. For the preceding week they were 89,312 lb., valued at $146,204, and for the corresponding week in 1921 they were 72,408 lb., valued at $120,560.

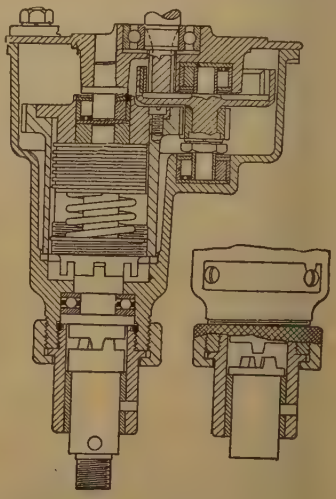
TOOL FOR TURNING DOWN NUTS

Electric Machines Intended to Shorten Operations —Special Features Outlined

An electric tool designed for turning down nuts, cap screws, wood screws, studs and similar fastenings and arranged to operate in either direction, has been placed on the market by the Elecdrive Mfg. Co., Inc., Syracuse. It is intended to shorten the operations of starting by hand, driving and setting nuts or screws and can be used on left-hand threads or for turning-off nuts, screws and the other fastenings.

At present the machine is made in three sizes, two portable and one stationary type. The portable tool as shown in the illustration resembles in general outline the ordinary electric drill. The stationary type is shown in the separate illustration, and represents a departure from the usual design of nut or screw driving machine.





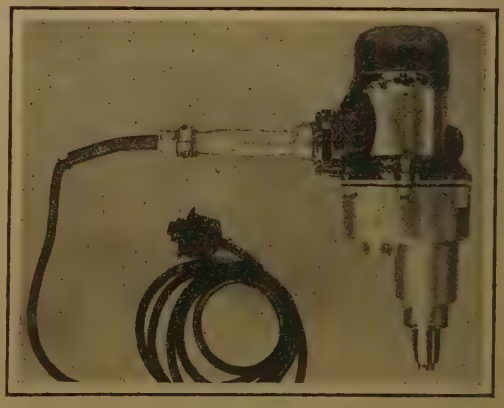
Electric Tool for Turning Down Nuts and Screws. The stationary type is shown in operation at the left, and the portable machine below. The arrangement of the mechanism is shown in the view above

The driving mechanism of the tool is the patented feature and incorporates a multiple-disk slip clutch, adjustable for any tension within the capacity of the motor and operating through a spline shaft to a positive clutch. The arrangement is such that the positive clutch automatically "kicks out" when the disk clutch fully releases. While the positive clutch is kicked out or disengaged, the driving spindle is relieved from torque and is free. This feature permits the removing of the wrench, chuck or screwdriver from the driven member and their engagement with a new member while the motor is running at full speed. The slip clutch requires that all nuts or screws be driven to the same tension and also prevents any shock reaching the motor. Because the clutch cannot be tightened to a degree that will stall the motor, the motor cannot be overloaded or burned out. Setting up of the nuts or screws slowly is a feature of the clutch arrangement and it is emphasized by the makers that without the clutch arrangement provided, threads would be stripped, the bolt strained or the tool damaged.

The portable tool operates from an electric light socket on either direct or alternating current at 110 volts, where the frequency does not exceed 60. The stationary type is usually connected to a power line, but where a large margin of safety has been used on the lighting circuit, the tool may be connected to a socket. The stationary type is also a universal motor and can be used on any circuit up to 60 cycle. The motors employed are of special design for the work done and are said to be of exceptionally high speed for universal motors, operating through a set of reduction gears with a ratio of 10 to 1.

Both the portable and stationary types are equipped with wrenches of special design, recessed and tapered to permit nuts to be picked from the bench while the tool is running at full speed. The nut or screw is held in the wrench so that its axis is true with the driving spindle of the machine and can be started on the thread without danger of cross threading.

The driving spindle of the machine rotates at 1000 r.p.m. while the nut or screw is being driven down, excepting the fraction of a turn necessary for the actual setting. The spindle then decreases in speed gradually until during the actual setting-up operation it is rotating at only approximately 350 r.p.m. The driving spindle of the smallest tool develops when driving nuts or cap screws from 10 to 12 foot-pound torque, the larger portable tool developing from 12 to 14 foot-pound torque and the stationary tool setting nuts or cap screws that require 65 foot-pound torque.



The reversing control mechanism is unique and has been designed for this type of motor only. The motor can be thrown from direct motion into reverse only after the current has been broken. The stationary type can be equipped with a hopper to handle double chamfered nuts, cap screws, wood screws, and other types. When the hopper is used the speed of the machine is greatly increased and in experimental work, 32, ⅜-in. nuts are said to have been started, driven and set in one minute.

Progress in the Open-Hearth Process*

Some Results from the Blow Torch Furnace—Its Principles and Advantages — Steel Encased Regenerators

BY WILLIS McKEE

UNTIL the last couple of years probably no process in the steel-making industry progressed less since its introduction than the making of steel in the open-hearth furnace. From the building of the first successful furnace in this country, a little more than 50 years ago, there had been no basic change in open-hearth construction. It is true that during this time the units had become larger and more substantially built; the facilities for handling the materials to and from the furnaces had become much more satisfactory; improved valves had been invented; water-cooled ports, doors, door frames and buckstays had been employed and slag-line coolers had been installed; but the time of the making of the heat had remained approximately the same, the fuel economies had been improved but little and the operation of the furnace was no more under the control of the operator than a half century ago. The problem of satisfactory refractories is still unsolved, although this phase is now receiving most intensive study and consideration. The operation of the units is intermittent, shutdowns being necessitated every few weeks for repairs to the brick work.

Heat Balanced

About 10 years ago a careful test was run at the Homestead works of the Carnegie Steel Co. to determine the heat balance of the open-hearth furnaces. The furnace used in the test made an average heat of 54.6 tons; natural gas was used as fuel. This test was run for seven or eight months. The results proved that the losses due to the temperature of the escaping gases, radiation, conduction and other causes amounted to 95.77 per cent of the heat units supplied by the combustion of the incoming fuel. This brings us to the startling conclusion that if we could eliminate all such losses that there would be only about 20 to 30 lb. of coal required per ton of steel produced. It is not to be expected that any such efficiency can be obtained, but it is time that careful thought be given to the saving of our fuel supplies and to the lowering of the cost of steelmaking by their more economical use.

In the last 10 years, the use of water-cooled devices has had a tendency to stabilize the operation of the furnaces, but excessive use of water of course decreases the thermal efficiency of the furnace, so that the use of such equipment must not be carried to excess. The use of waste heat boilers has materially decreased the heat losses but at a considerable cost of installation. The fact that the stack losses are great enough to justify the installation of waste heat boilers helps us to realize the inefficiency of the process.

Efficiency and Poor Combustion

The greatest cause of the low efficiency is imperfect or delayed combustion. It has been customary to introduce the gas into the hearth in a semicircular port at about ⅛ to 1-in. pressure and to introduce the air around it at a pressure which is created by the column of heated air from the bottom of the checkers to the top of the uptake. Although it was early appreciated that it was necessary, in order to obtain the temperature required in the open-hearth furnace, to preheat both the gas and air to as high a temperature as possible, no attempt appears to have been made to see that the gas and air were intimately mixed with the result that although some particles of air and gas mixed promptly at the end of the port and combustion started quickly, other particles of air never came in contact with the gas until reaching the other end of the hearth and frequently not until they had reached the slag pockets or regenerator chambers in the outgoing end of the furnace.

This delayed combustion not only decreases the thermal efficiency of the furnace and lengthens the time required for a heat, but it causes needless destruction of the uptakes, slag pockets and regenerators. In order to insure combustion it has been customary to supply additional air, which, of course, decreases the thermal efficiency. In the test previously mentioned, it was found that 150 per cent excess air was actually being used. If such excess is maintained while conducting a test, it is to be assumed that under normal conditions, even worse practice prevails.

Only about three years ago it was first proposed to mix the fuel and air before they entered the hearth of the furnace so as to obtain complete combustion promptly. This is an application of the Bunsen burner or blow torch principle which was invented some 65 years ago with the exception that the Bunsen burner insures against burning in the mixing chamber by having the velocity of the gases such that the flames cannot travel back into the mixing chamber. In an open-hearth furnace the temperature of the gases coming from the regenerators is so high that the flame is initiated as soon as the gases come in contact with each other. It is, therefore, necessary in order to use this principle to cause the gases to travel at such a velocity that there will not be enough combustion in the port to raise the temperature to such a point as to cause rapid destruction of the port.

[The author discusses by means of drawings the principles of the Egler furnace. This furnace was described in THE IRON AGE, June 2, 1921.]

Requirements of Blow-Torch Furnace

After a careful study of the requirements of a successful blow torch or Bunsen burner installation, it has been found that the following conditions must be met:

When using producer gas it is necessary to so introduce the air and gas that excessive gas house pressure will not be required. In other words, if over 1½-in. air pressure is used (and a higher pressure has been found desirable) it is necessary to aspirate the gas so that the proper amount of gas can be introduced without necessitating a gas house pressure in excess of 2 in.

It is necessary to insure a perfect mixture of the gas and air before they issue from the port.

It is necessary to properly direct the flame so that it will impinge sharply upon the bath so as to not only obtain full benefit of the blow torch flame but to prevent it coming in contact with the brick work.

Adequate outlet ports must be provided to carry off the products of combustion.

These conditions are fully met in the construction shown. The combined port is long enough not only to thoroughly mix the gas and air but to properly direct the flame upon the bath. The velocity of the gases is such as to avoid excessive combustion in the port. The ports are exterior of the furnace, that is, the brick work forming the port is not subject to the high temperature of the furnace on both sides. This greatly lengthens the life of the ports. The valve arrangement is simple and not liable to get out of order due to expansion and contraction of the brickwork.

In the operation of a furnace this description at the plant of the Brier Hill Steel Co., Youngstown, using natural gas, 9111 tons of high grade basic open-hearth steel were made in 31 days, with a charge consisting of 65 per cent heavy melting scrap, 6 per cent cold pig

*From a paper presented at the annual convention of the American Foundrymen's Association at Rochester, N. Y., June 5 to 9. The author is connected with Arthur G. McKee & Co., Cleveland, engineers.

iron and 29 per cent hot metal. The best tonnage ever made in this plant on a furnace using ordinary method of construction was 6344 tons, and this record was made when using a mix of 45 per cent scrap and 55 per cent hot metal. The average monthly output per furnace of this plant operating on approximately 45 per cent scrap is 5000 tons per month.

On account of the short, sharp, blow torch flame the gases attain their highest temperature and combustion is completed before they reach the middle of the hearth. From this point their temperature drops

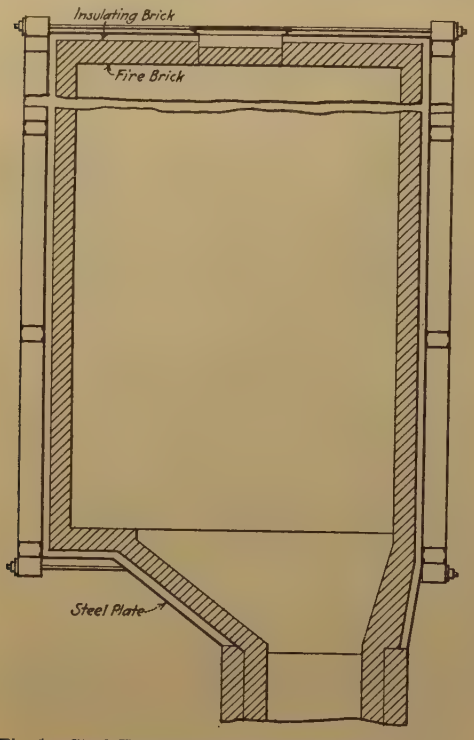


Fig. 1.—Steel Encased Insulated Regenerator Chamber

rapidly due to the radiation and transmission of heat to the bath, so that, notwithstanding the fact that the flame in this furnace is much hotter than in other furnaces, the temperature of the escaping gases in the downtakes and in the regenerator chambers is very considerably decreased. In other words, the combustion is completed so early that the maximum amount of heat is retained in the bath, greatly increasing the thermal efficiency of the unit and decreasing the repairs to the downtakes and regenerator chambers.

In practice at the Brier Hill Steel Co.'s plant, the stack temperatures have been found to average 300 deg. Fahr. lower than in their other furnaces. There is not enough data collected as yet to show just what fuel economies can be obtained, but it appears that the saving will be in the neighborhood of 20 to 25 per cent.

One of the greatest advantages of the system is due to the fact that the fuel and air are both thoroughly under the control of the operator so that the temperature of the bath can be regulated to a nicety. On account of the thermal efficiency of the furnace there is less contamination of the bath from the impurities in the fuel.

Although attention is called to the fact that greater economies and greater production can be procured due to these improvements in design, too much stress cannot be laid on the fact that the using of this process enables the operator to make a uniformly better grade of steel. Due to the fact that the charge is melted down so rapidly, a higher percentage of scrap can be used without the addition of carbon, thus making possible the use of a much cheaper mix.

There are may refinements of the blow torch furnace which will be worked out, but the results so far obtained are so remarkable and the correctness of the principle involved has been so universally acknowledged as to insure its rapid introduction.

Other Improvements

This process of combustion has opened up quite a number of possibilities for the further improving of open-hearth construction which deserves very serious consideration. In Fig. 1 is shown an open-hearth furnace in which the regenerators are encased with insulating bricks and steel platework. Inasmuch as the use of the steel platework enables the use of much thinner walls, it is evident that this construction is little more expensive than that which is now used, while the saving due to decreased heat losses is appreciable. Furthermore, the regenerator chambers can be maintained in much better shape and the temperature of the basement is materially decreased, making it much more livable.

A more radical departure is the eliminating of the gas regenerator chambers when using producer gas as shown in Fig. 2. It is proposed to locate the gas producers comparatively near to the open-hearth and conduct the gas in suitable steel mains, properly insulated, to the ends of the furnace and introduce the gas into the air uptakes without any regeneration. This practice becomes possible only by the use of the blow torch principle, where the air and gas thoroughly mix before they issue from the port so that the resultant temperature of the mixture is the only temperature that needs to be considered. Inasmuch as approximately 800 deg. Fahr. stack temperature is now obtained in a blow torch furnace, it is evident that the temperature of the gases escaping through the air checkers is much lower than those escaping through the gas regenerators, as the incoming gas cannot possbly lower the temperature of the gas checkers below 1050 to 1100. Therefore, it is evident that by making all the gases escape through the air regenerators the temperature of the incoming air will be considerably higher than when

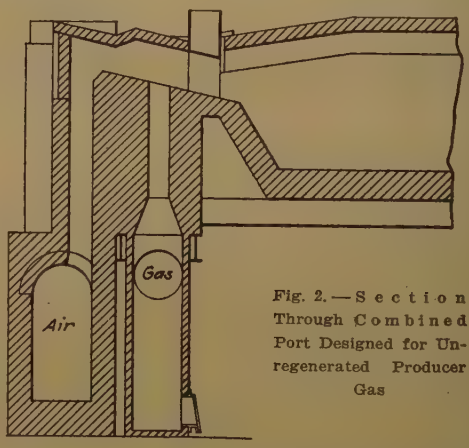


Fig. 2.—Section Through Combined Port Designed for Unregenerated Producer Gas

the gases are divided and the resultant temperature of the mixture of gas and air will be substantially the same as at present.

This construction appeals strongly to those to whom it has been suggested because it eliminates the gas loss that now occurs whenever the furnace is reversed when not only all the gas from the end of the port back through the generators to the gas valve is lost but with most designs or valves the gas in the mains back to the producers is exhausted by being connected to the stack during reversals. It eliminates the hydrocarbon loss which now occurs in the regenerators and the difficulties due to the clogging of the gas checkers. This construction greatly decreases the volume of the slag pockets and the heat losses due to radiation from the excessive space between the checkers and the ports. Structurally this construction is exceedingly desirable as it greatly decreases the cost of the furnace and shortens the distance required from center to center of furnace by 5 to 10 ft. It also eliminates the center

wall in the slag pockets and the need of overhung brickwork in the uptake.

Conclusions and Advantages

There is no question but that the transition through which the open-hearth is now passing will so increase the capacity of existing units that there will be practically no construction of new open-hearth plants required to meet the demand for steel for a number of years, but one of the biggest problems incident to the introduction of the rapidly operated furnace will be to get the raw material to the furnace and to handle the material on the casting side. New plants must be carefully laid out so as to eliminate as far as possible delays due to shop conditions and doubtless existing ones will need to be considerably altered and improved to take care of the additional materials to be handled.

While previous inventions in the open-hearth have had for their object increasing the comfort of the operators and the decreasing of the shut-downs and repairs to the furnace, the effects of this invention are so far reaching that it is difficult to appreciate the magnitude of the development. The principal advantages as have been outlined are:

Better steel
Increased fuel economy.
Greatly increased output
Longer life of the furnace
Possibility of using a higher percentage of scrap
Decreased plant cost for a given capacity

By using unregenerated producer gas as proposed, it should be possible to obtain the following additional advantages:

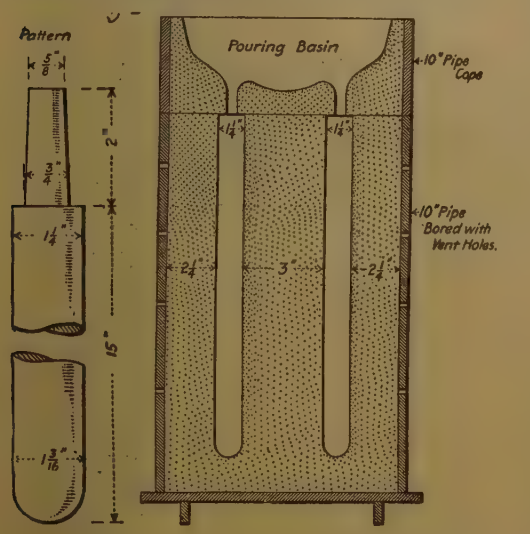
Additional fuel economies
Greatly decreased cost of construction
Simpler construction

No great invention is ever made that does not require considerable study and the careful co-operation of all interested before the full benefits of such invention can be obtained, so it will be necessary to have the hearty co-operation of engineers and operators before the maximum results are derived with the blow torch furnace. However the correctness of the principle is so universally acknowledged and the results already obtained are so remarkable as to necessitate its rapid introduction.

HIGH TEST IRON CASTINGS

New Specifications for Castings Containing Steel—The Arbitration Test Bar

New tentative specifications for high-test gray iron castings, familiarly known as semi-steel, were adopted by the American Society for Testing Materials, at its annual convention at Atlantic City, N. J., June 26th to 29th. They represent the latest ideas as to the properties of this much-discussed metal, and also include details of the arbitration test bar. They are as follows:



1. These specifications cover all classes of gray-iron castings which are required to have a high strength, including those generally known as semi-steel castings.

2. The tension test will be made only when specified by the purchaser and at his expense.

MANUFACTURE

3. The castings may be made by the cupola, or any other approved process.

PHYSICAL PROPERTIES AND TESTS

4. (*a*) The transverse test specimens (arbitration test bars) specified in Section 6 (*a*), when placed horizontally upon supports 12 in. apart and tested under a centrally applied load, shall withstand a minimum load of 3800 lb. and deflect under this load at least 0.12 in. at the center.

(*b*) The rate of application of the load shall be such that a central deflection of 0.10 in. is produced in from 20 to 40 sec.

5. When tension tests are specified, the tension test specimen shall show a minimum tensile strength of 28,000 lb. per sq. in.

6. (*a*) *Arbitration Test Bar.*—The form and dimensions of the mold for the arbitration test bar shall be in accordance with Fig. 1. The bottom of the bar shall be ☆ in. smaller in diameter than the top, to allow for draft and for the strain of pouring. The pattern shall not be rapped before withdrawing. The flask shall be rammed up with green molding sand, a little damper than usual, well mixed and put through a No. 8 sieve, with a mixture of 1 to 12 bituminous facing. The mold shall be rammed evenly and fairly hard, thoroughly dried, and not cast until it is cold. The test bar shall not be removed from the mold until cold enough to be handled. It shall not be rumbled or otherwise treated, being simply brushed off before testing.

(*b*) *Tension Test Specimen.*—When tension tests are specified, the tension test specimen shall be turned from any

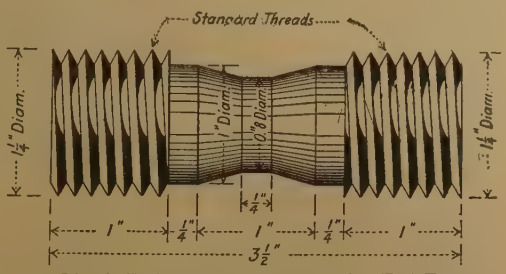


Fig. 1 (Left).—Mold for Arbitration Test Bar
Fig. 2 (Above).—Tension Test Specimen for High Test Cast Iron

of the broken pieces of the transverse test specimens, and shall conform to the dimensions shown in Fig. 2.

7. (*a*) Two sets of two arbitration test bars each shall be cast from each melt, one set from the first and the other set from the last iron going into the castings. Where the melt exceeds 20 tons, an additional set of two bars shall be cast for each additional 20 tons or fraction thereof. In case of a change of mixture during the melt, one set of two bars shall also be cast for every mixture other than the regular one. Each set of two bars shall be cast in a single mold.

When a large casting is made for which test bars are required, the test bar shall be cast from the same ladle of iron used to pour the casting. If two ladles are used for pouring the casting, the iron for the test bars shall be poured from a ladle of iron caught between the pouring of these two ladles. In either case the test bars shall be poured at as near as possible the same temperature at which the casting is poured.

(*b*) All arbitration test bars cast shall be tested as specified in Section 4 (*a*).

8. One arbitration test bar of each set cast shall conform to the requirements specified in Section 4 (*a*); otherwise the castings represented by such bars shall be rejected.

WORKMANSHIP AND FINISH

9. The castings shall be true to pattern and free from

gas holes, cracks, flaws and excessive shrinkage. In other respects they shall conform to whatever points may be specially agreed upon between the manufacturer and the purchaser.

INSPECTION

10. The inspector representing the purchaser shall have free entry, at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of the castings ordered. The manufacturer shall afford the inspector without charge all reasonable facilities to satisfy him that the castings are being furnished in accordance with these specifications. All tests and inspection shall be made at the place of manufacture prior to shipment, unless otherwise specified, and shall be so conducted as not to interfere unnecessarily with the operation of the works.

GERMAN CAPITAL IN RUSSIA

Reported Combination with Soviet to Exploit Metallurgical Resources on Capitalistic Basis

By Special Correspondence

BERLIN, GERMANY, June 28.—Stories have been current for some time that Krupp, Stinnes, and the Allgemeine Electricitats Gesellschaft (A. E. G.) have completed an agreement with the Russian Soviet Government whereby is secured a large control in the restoration of Russia's metal and machinery industries. These three groups for nearly a year have had representatives in Petrograd and Moscow. The German trade press has hardly touched the matter, but Russian and some neutral newspapers have dealt with it at length. The Russian *Rabotchi Golos* of June 11, states vaguely that "an agreement has been signed with the three greatest German iron concerns." The Christiania *Handelstidende* of May 31, professes to give exact details. The Stinnes agent in Russia, says this authority, is a departmental chief of the Siemens-Schuckert Co., which is in the Stinnes Electro-metal combination; Krupp has numerous agencies; and the late Dr. Rathenau sent negotiators on behalf of the A. E. G. At the end of May, says the article, these three companies signed an agreement with the Soviets. A limited liability company is to be established, in which the three German companies will each hold a one-fourth interest, the Russian state taking a fourth interest. The plan is to "utilize Russia's latent natural resources for restoration aims on a sound German capitalistic basis."

Though this story is neither confirmed nor denied, it accords both with the new soviet law, and with similar deals of less importance. The Moscow official *Ekonomitcheskaya Zhizn* lately published the text of a law authorizing the foundation of "mixed" corporations with foreign participation; and to date there have been founded nine such corporations: Metallotorg, Napthaexport, Linotorg, Dwinoles, Seweroles, Koshsyrie, Derumetal, Russangloles and Russgolandles. The mixed corporation Metallotorog sells and buys scrap metal of all kinds in Russia and abroad. The Derumetal has a monopoly for export of Russian scrap iron to Germany. Its partners are the Soviet Government, and Robert Lewi, chief of the Lichtenberg Metal Co., Berlin; and the capital is 2,000,000 m. The other mixed companies deal in naphtha, flax, animal raw materials and wood. The most important concession to foreign capital is an agreement said to have been reached with the Moscow Supreme Industrial Council leasing all nationalized mechanical workshops at Odessa to the Czecho-Slovak Skoda concern. Prague newspapers state that this deal has been completed but Russian confirmation is lacking.

Before any of these combinations becomes effective, the Soviet Government must first define the relations of foriginers with the lately-formed companies. So far these combinations are entirely Russian. The movement toward large combinations began in the late summer of 1921; progressed, at least on paper, rapidly, and today embraces the greater part of the heavy iron and steel, the locomotive, and the general mechanical trades. The *Krasnaya Gazeta* of June 7, lists 23 of these combinations. All are composed exclusively of formerly nationalized concerns, which have been removed from the direct control of the supreme council of industry, and fused into semi-independent corporations. These companies are permitted to sell all, or a fixed part, of their output in the free market at whatever price can be obtained; and are allowed to import raw materials and fuel without permission of the foreign trade commissariat, which in general still claims a monopoly in foreign trade.

Of the metal combinations the most important is Jugostahl (Southern Steel). This embraces the Petrovsk, Makeevsk and Hughesovsk iron and coal companies in South-East Russia. Jugostahl must deliver 75 per cent of its output to the State at State prices; but can sell the remaining 25 per cent at will. At present 35,000 men are employed. A second metal combine is the zinc-lead trust, comprising the Ruidlerovsk smelting works, and the Ekibastuask and Zuirianovsk mines in the Urals, with right to take in other concerns. In the locomotive combination are the Sormova, Kolomensk, Briansk, Muitishensk and Raditsk rolling stock and mechanical workshops, and five other metal works. A second company, formed in November, includes the Nobel, Phoenix, Tillmans, Koppel and two Lessner companies. A third embraces the Ural platinum industry. The total number of employees in metal and mechanical corporations so far is stated as 92,000; but the normal pre-war staff in the same concerns was nearly 300,000.

According to Comissary Okunieff, all these combinations are so far losing money. The losses of the important Jugostahl for September-May inclusive amounted to three-fifths of the value of the output. The official *Ekonomitcheskaya Zhizn* suggests as a remedy that the State should pay full market price for goods delivered under agreement by these companies; otherwise "it cannot pretend that the so-called financial independence is a privilege." The main obstacle to financial success, however, is inadequate production. All reports of the new companies' operations in their first months of existence agree that the relative independence from the bureaucratic supreme council, the employment of private experts, and the freedom to concentrate skilled labor, raw materials and fuel in the more efficient workshops (the inefficient being closed entirely) led to a considerable increase in output; but output is still small. In the summer of 1921, before being combined, the Jugostahl companies were producing about 2,500,000 puds (1 pud = 2.2 lb.) of coal a month; this amount increased to 4,800,000 puds in October, the first month they were combined, to 6.000,000 puds in November, and to 9,000,000 puds in January. The pig-iron production rose from 60,000 puds in September to 270,000 puds in November, and 350,000 puds in February. The output of open-hearth steel, castings, and sheets also increased. The production program of this company for 1922 is 10,000,000 puds per month of heavy and semi-finished iron and steel.

Last reports show that in all Soviet-Russia the coal output has again begun to decline, whereas the iron and steel output is still increasing. Coal output, in April, was 25,202,000 puds. The iron-ore output in March was 1,216,000 puds against 850,000 puds in February. The output of foundry iron in January and February was 1,805,000 puds, open-hearth steel 3,500,000 puds, and rolling mill products 2,226,000 puds, as against 7,083,000 puds, 10,025,000 puds and 12,303,000 puds respectively for the whole of 1921. The figures for this year show a considerable increase.

Shipping Board Sales

WASHINGTON, July 18.—The auction sale of the Emergency Fleet Corporation of its surplus marine stock at St. John's warehouse, Portland, Ore., has been completed and as a result practically all of the material has been disposed of at that point. The total receipts were approximately $51,000.

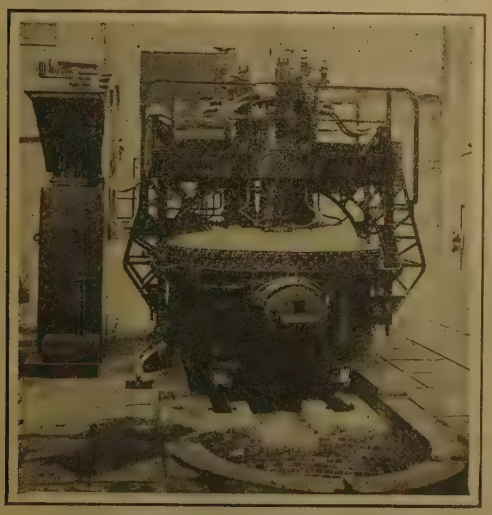
The next sale of the Shipping Board's property on the Pacific Coast will take place at Tacoma, Wash., July 25.

NEW FIAT ELECTRIC FURNACE

Characteristics and Claims of the New Italian Melting Unit

BY DR. ALFRED STROMBOLI*

WHEN Stassano in 1898 brought to the metallurgical world his new electric furnace for the manufacture of steel, the Italian steel mills quickly realized the great advantages of this new process, but only during the World War period did they adopt it on a large scale. The scarcity of coal and the poor quality of



The Fiat Electric Steel Melting Furnace

pig iron, both of which had to come from foreign countries, was no doubt the deciding factor. Some of the largest steel mills were confronted with the serious problem of how to fill their orders. Notable among them was the Fabrica Italiana d'Automobile di Torino (Fiat), which had to produce 1000 tons of steel ingots per month. Such a production could never be obtained by the ordinary processes, due to the great difficulty in getting cool and raw material on time and of good quality.

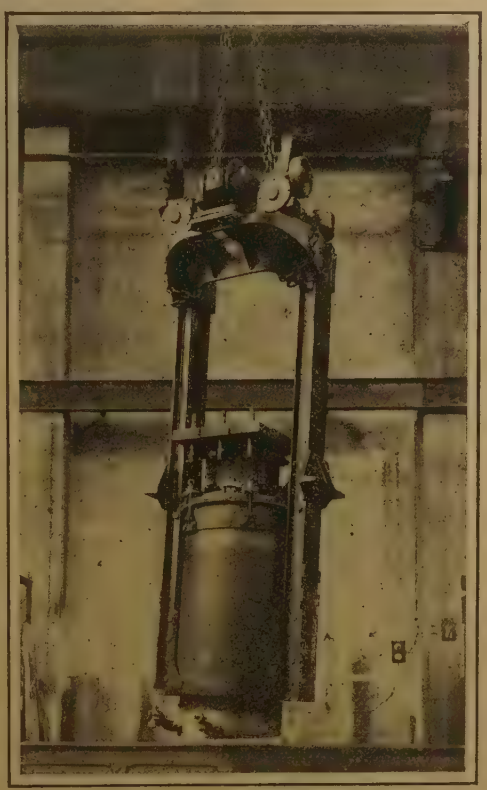
The necessity of finding a type of electric furnace of large capacity and able to make steel out of iron and steel scrap was an urgent problem. After much study and a series of tests the decision to build a new type of Fiat electric furnace was reached. The Fiat works immediately started the construction of a furnace which has achieved success during its continuous operation for five years. Of this type of furnace there are six of 5 and 6 tons capacity and one of 1½-ton capacity in service at the Fiat works and four of 20 tons capacity, two of 6 tons and two of 3 tons capacity at the Ferriere Piemontese, Turin, also part of the Fiat works.

This type of electric furnace was so successful that the Fiat company decided to organize the Fiat Electric Furnace Works for the exclusive construction of electric furnaces. A brief description of the main characteristics of these furnaces follows:

The Fiat furnaces are of the three-phase system having the neutral grounded through the furnace's frame. One illustration shows an external view of a 5-ton furnace. A rigid steel cylinder having a concave base and reinforced by means of riveted steel angles forms the frame. Circular cast steel rockers are provided at the base for the two movements of the furnace. At the top the removable cover is of silica brick and encircled by a wrought iron ring. This cover tightly closes the furnace by means of four lateral hinged bolts. On opposite sides of the frame two openings are provided for the charge, purification and discharging of the metal. This furnace is moved by means of two hydraulic engines having oscillatory cylinders, with their pistons attached to the two rockers on the furnace.

One of the most important features of the Fiat furnaces is the Fiat economizer or electrode supporter. The Fiat electrode supporter will not allow air to get into the furnace through the opening made in the roof for the passage of the carbon electrodes. This is accomplished by means of a specially designed supporter. The air which penetrates into the furnace not only has the disadvantage of considerably shortening the life of the electrodes, but, worse yet, enormously decreases the efficiency of the furnaces.

The Fiat economizer was briefly described in THE IRON AGE, Feb. 23, 1922, page 538. This economizer is so designed that it can be quickly cleaned, inspected or removed from the furnace as shown in one illustration. Before the use of this device the electrodes used to burn to a conical shape and even 30 or 40 cm. on the part outside of the furnace. There was also great damage done by the escaping gas. When the electrodes burn out in a cylindrical shape it is obvious that they can carry more electrical current and will last longer. An electrode which had an initial length of the point of 1.5 m. (4.9 ft.) and weighed 120 kg. (265 lb.), after serving 21 full charges on a 5-ton Fiat furnace, each charge having been cold, was reduced in length to 25 cm. (9.8 in.) with the weight to 20 kg. (44 lb.). This represents a consumption of only 2.85 kg. (6.3 lb.) of electrode per ton of steel.



The Fiat Economizer as It Appears When Lifted Out of the Furnace

The potential used in the Fiat furnaces is 130 to 75 volts stepped down from a 21,000-volt supply line. The first voltage, 130, is used for the first stage, that is, to melt the metal, and the lower one to maintain the metal in a molten condition during the refining process.

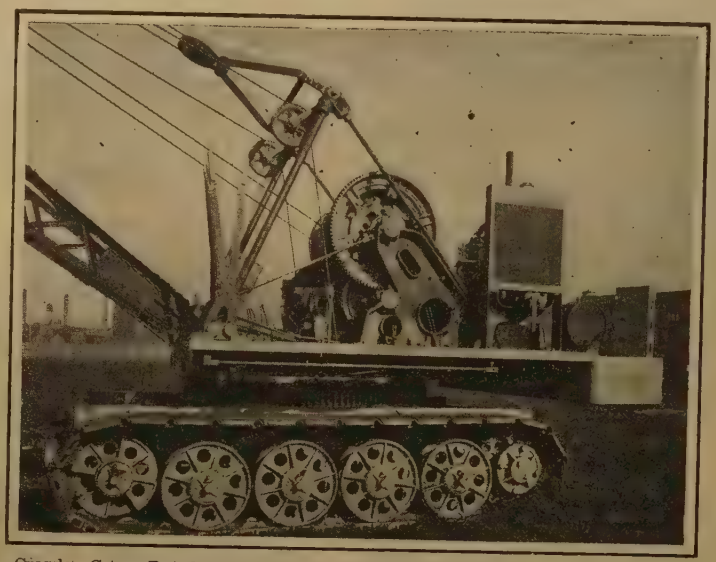
Costello continuous pair furnaces are to be installed in the plants of the Wheeling Steel Corporation, the Newton Steel Co. at Newton Falls, Ohio, and the Superior Sheet Steel Co., Canton, Ohio, by Tate-Jones & Co., Inc., Pittsburgh.

*Turin, Italy.

NEW CRAWLER CRANE

Lower Frame a One-Piece Casting—Improved Control Features—Mechanism Described

The crawler crane shown in the illustration and which embodies a number of new features has been placed on the market by the Link-Belt Co., Chicago. Without bucket the machine weighs 22 tons, making a ground pressure of 10 lb. per sq. in. and it is rated to lift 10 tons at 12 ft. radius and three tons at 30 ft. radius. The hoisting speed is 125 ft. per min. with a maximum rope pull of 10,000 lb. on a single line. The machine is suitable for both clam-shell and drag-line bucket work, having two independent band-clutch operated hoisting drums. The crane will rotate four times a minute, travel ¾ mile per hour and climb a 20 per cent grade.



Crawler Crane Rated to Lift 10 Tons at 12 Ft. Radius and 3 Tons at 30 Ft. Radius. The boom is 35 ft. long and of angle and lattice bar construction, parabolic in shape

The shoes are 18 in wide, of 12 in. pitch, and made of one-piece high-carbon chrome steel castings with machined holes for 1¾-in. diameter high-carbon pins. There are eight bronze - bushed crawler rollers, 25 in. in diameter. The over-all width of the crawler tread is 9 ft. 7 in., and the distance from center to center of the sprockets, lengthwise, is 10 ft., giving a bearing area of 30 sq. ft. The lower frame is a one-piece annealed open-hearth steel casting designed to carry the severe diagonal stresses of a machine of this type.

A hollow cast-steel dead axle housing has been provided on which the load carrying sprockets are mounted and inside of which the floating drive axles are located, cut bevel gearing running in oil being used. The control clutch steering the caterpillar, is also placed inside the housing and is in constant connection with a foot lever on the operator's platform, and can be used in any position of the rotating base. The foot lever also instantly locks the caterpillar, so that the crane can be operated on an incline without resorting to blocking. The bevel gearing underneath the frame, connecting the vertical travel shaft with the longitudinal rear axle countershaft, is also inclosed in a cast-steel casing, the gears running in a bath of oil.

The rotation gear, roller path and center casting form a single steel casting 7 ft. in diameter, the large size of which is intended to keep the center of gravity of the rotating frame within the roller race, thereby materially reducing the stresses in the center pin and rotating mechanism. The upper rotating frame, a single-piece annealed open-hearth steel casting, 14 ft. long, 5 ft. wide, and 11 in. deep, rotates on four 12-in. diameter, 4-in. face finished and bronze-bushed conical steel rollers, and is held to the lower frame by a finished forged steel center pin.

The machine is driven by a Climax Engineering Co. four-cylinder, heavy-duty tractor engine with a gasoline tank of 30-gal. capacity, or enough for about 15 hr. continuous operation. A 40 hp. electric motor can be provided instead of the gasoline motor, if required. All gears with the exception of the rotation gear and pinion, have machined teeth. There are only three bevel gears on the rotating frame and only 16 gears of all descriptions in the entire crane.

The reversing friction clutches for swinging, traveling and boom hoisting are of the expanding type and may be applied with a minimum of effort. The boom hoisting mechanism is automatically self-locking. The brake drums are mounted on extended hubs of their respective rope drums and connected with them by means of ratchet and pawl mechanism. The operator can set his brakes either before or while hoisting his load, so that the moment he pulls his hoist clutch out of engagement his load is automatically held in position. This permits a less skilled operator to run the crane, as it requires a certain amount of dexterity to manipulate clutch and brakes simultaneously.

The construction of the crane is such that all of the machinery may be inclosed. Inside the housing there is an unobstructed platform, 30 in. wide the full length on each side of the rotating base so that the machinery is easily accessible. The machinery may be dismantled without disturbing the house. All necessary attachments for hook block, grab bucket, dragline bucket, pile driver and magnet up to 45 in. in diameter, are included in the equipment.

New Use for Steel

What may be referred to as a new use for steel has been observed in the way San Francisco holds back its crowds in providing for parades. Most of the marching celebrations occur on Market Street, from the Ferry Building to the City Hall. The police department has adopted a plan of stretching a strong steel cable along the street near the curb.

The cable is supported by heavy wooden posts at regular intervals. The posts are let into holes in the roadway pavement, about a foot out from the curb. To protect the edge of the hole and to hold the post firmly, a flanged iron collar is set into the top of the hole. An iron cover, similar to the cover of a small waterworks valve box, is kept on each hole when the posts are not in place. At street intersections, the cable is laid in the adjacent gutter until a few minutes before the approach of the parade, when it is drawn across the intersecting roadway by the policeman in charge of each intersection. Police department wagons follow up the parade and the posts are loaded into these and the rope is wound up on drums, the entire equipment being stored in the basement of the Hall of Justice.

Compression Tests of Forging Steel

A series of compression tests at temperatures between 20 and 700 deg. C on carbon forging steels has been completed at the Bureau of Standards, Washington. In this series the proportional limit decreased slightly with rise in temperature of 300 deg. C and thereafter more rapidly to a very low value at 700 deg. C. The yield point which was determined by means of the drop of the beam of the testing machine first increased and then decreased.

Fuel Gases in Iron and Steel Plants

Characteristics of Blast Furnace, Coke Oven and Producer Gas, and of Their Use in Continuous Heating Furnaces

BY H. S. WATTS*

BLAST furnace gas, producer gas and coke oven gas are the only fuel gases which can claim general usage in steel plants. Natural gas has come into disuse because of the limited supply available, and blue water gas has not passed the experimental stage in the industry.

Blast furnace gas has been available, with the production of pig iron, since the advent of the closed-top blast furnace. Similarly, coke oven gas has been collected and used in large quantities where by-product coke ovens are installed. Producer gas, once the most generally used fuel in steel plants, is now employed on certain operations when there is not enough coke oven gas.

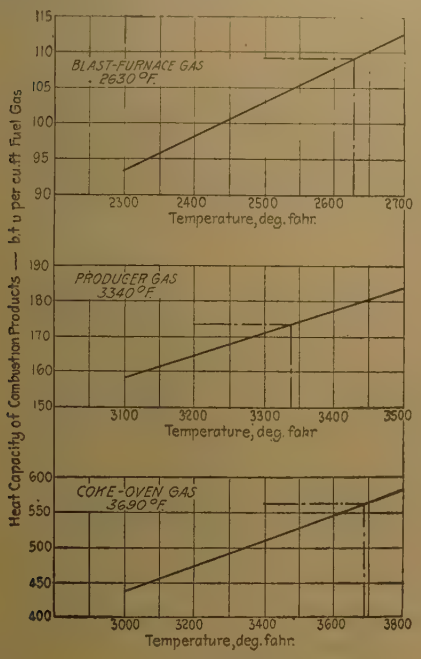


Fig. 1. Theoretical Combustion Temperatures of Blast-Furnace Gas, Producer Gas and Coke-Oven Gas

A fuel gas is principally characterized by its chemical analysis. The proportions in which the various constituents are found bears strongly upon its action in the furnace, its adaptability to certain operations, and, in general, its value as a fuel. Volumetric analyses of typical gases are shown below. Since all of these gases are derived primarily from coal, it is not unusual that they have practically the same constituent compounds. Carbon monoxide, hydrogen and the hydrocarbons are the heat-producing components.

ANALYSES OF TYPICAL GASES

	Percentage Composition		
	Blast Furnace Gas	Coke Oven Gas	Producer Gas
Carbon Dioxide	12.8	1.8	6.2
Carbon Monoxide	26.0	3.5	22.3
Ethylene	...	3.0	0.3
Methane	0.2	34.6	3.5
Hydrogen	3.0	53.9	12.3
Nitrogen	58.0	3.2	55.4

*Steam Engineer, Otis Steel Co., Cleveland. Abstract of paper presented before the Association of Iron and Steel Electrical Engineers.

These analyses show producer gas and blast furnace gas to be strikingly similar in the large proportion of non-heatbearing components, in contrast to coke oven gas, which is composed almost entirely of compounds having fuel value. Further, it may be seen that furnace gas has a higher percentage of carbon dioxide than producer gas, while the latter contains more free hydrogen and hydrocarbons than furnace gas. Again, coke oven gas has a very small percentage of carbon monoxide, while the other two gases depend largely upon this compound for their fuel values. These variations in composition are due to methods of manufacture.

Production of Blast Furnace Gas

Air under pressure, entering the lower part of the furnace through a set of tuyeres, and coming into contact with incandescent carbon, results in forming carbon dioxide. In the presence of additional carbon, this is converted into carbon monoxide. Passing upward through the charge of ore, coke and limestone, a part of the monoxide is again changed to the dioxide in the reduction of ores. In the gas at the top, both oxides are present. Additional carbon dioxide is produced in the upper part of the furnace, due to the roasting of limestone.

The water vapor, contained in the air blown, is acted upon by hot carbon, with the formation of carbon monoxide and free hydrogen. The former is subjected to the same changes as the monoxide formed by the introduction of air. The hydrogen passes upward through the column, and a portion of it may combine with the carbon to form methane. The small quantity of volatile matter in the coke is driven off in the upper strata, and is represented in the analysis by additional quantities of free hydrogen and methane.

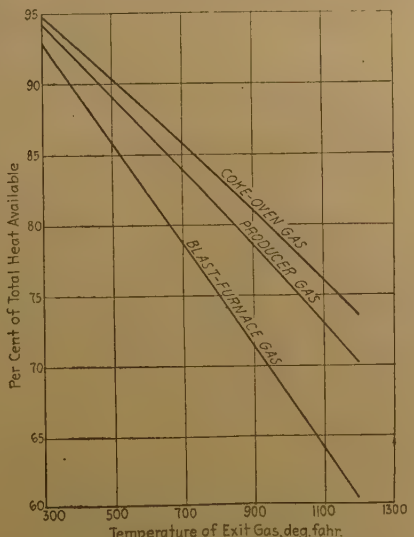


Fig. 2. Percentage of Heat Available with Perfect Combustion of Fuel Gases

Incombustible constituents include the carbon dioxide formed in the manner indicated, and the inert nitrogen derived from the air blown and, in small quantities, from the fuel. These components aggregate at least 70 per cent of the total volume. Another in-

combustible and very objectionable component of blast furnace gas, which does not appear in the chemical analysis, is water vapor. This is due to the vaporization of the moisture in the materials charged, and the water thrown on the charge in the skip bucket to lower the temperature at the top of the furnace. The evaporation occurs at or near the top of the column. The quantity of water vapor present may be roughly estimated, normally, at 30 grains per cu. ft. of gas, with a corresponding dew-point of 115 deg. Fahr.

Flue dust present in this gas is in quantities which vary widely with the furnace operation; but the

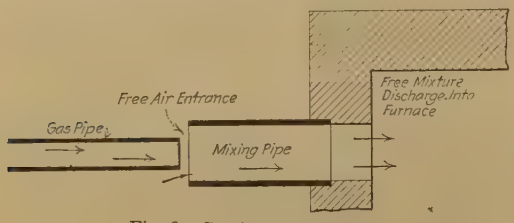


Fig. 3. Gas Burner Diagram

greater part is extracted before the gas reaches the point of consumption. The normal temperature of the gas leaving the furnace is about 400 deg. Fahr. In gas cleaners, where water is used to carry out the dust, the sensible heat of the gas is lost, depreciating its heating value somewhat less than 10 per cent. Due to the reduction of the gas temperature in passing through the wet washer, the vapor content is reduced.

The quantity of gas produced in the furnace varies slightly with the operation. For many reasons, it is difficult to measure the volume, but this may be closely estimated by reference to the analysis of the gas, and the analyses and weights of the materials charged and produced. In the particular case from which the typical analysis was taken, the volume generated was 68.7 cu. ft. at 32 deg. Fahr., per pound of coke charged. Since the calorific power of the gas is about 100 B.t.u. per cu. ft., the heat of the gas represents more than one-half of the heat in the coke charged. This fact may lend more interest to the problems confronted in the proper utilization of blast furnace gas.

Production of Coke Oven Gas

Coke oven gas is a by-product obtained in the modern process of coke manufacture. As the coal spaces are sealed so that no air may enter, and practically no combustion take place, the volatile constituents are slowly driven from the coal, leaving coke. The gas is collected in a common, overhead main, through which it is conducted to the by-product plant. The process primarily intended for the extraction of by-products, fortunately, is effective in thoroughly cleaning the gas.

Hydrogen and methane form, in the typical analysis, 88 per cent of the total volume. Unsaturated hydrocarbons, or "illuminants" are present in small quantities. The balance of the volume is composed of nitrogen and the two oxides of carbon. These formations are due both to the oxygen and nitrogen in the coal, and to the slight infiltration of air. Ordinarily, the foreign matter is so completely removed as to pass notice, except for occasional clogging of valves and fittings. The gas is usually saturated with water vapor at the point of consumption, but since the temperature is that of the surrounding air, the quantity of vapor contained is small.

Due to the large percentage of heat producing constituents, and the correspondingly low non-combustible proportion, the heating value of this gas is high. The standard cubic foot, at 32 deg. Fahr., has a net heating value of approximately 550 B.t.u. The gas weight is about 0.4, referred to air. The volume of gas generated depends upon the quantity of volatile matter in the coal and, to some extent, upon the operation. Normally 9000 to 11,000 cu. ft. are produced per ton of dry coal used. It then appears that the total volume of gas contains about one-fifth of the total heat of the coal charged. In the great majority of coke plants, about 40 per cent of the gas is used for heating the ovens; the other 60 per cent being available for mill use.

Producer Gas

In many respects, the formation of producer gas is similar to that of blast furnace gas. Air is forced into the producer at or near the base, usually by means of steam-jet blowers. When in operation, there are three general zones, of which the upper consists of the green fuel charged at the top. Immediately beneath this is the hot zone of incandescent coke which, in the cycle of operation, after being relieved of its volatile components in the upper zone, has been passed to the lower position. Beneath this, a bed of ashes forms the lower zone.

The fundamental chemical reactions in the producer are simple. Air and steam, entering at the base, soon encounter incandescent carbon in the hot zone. Oxygen from the air unites with carbon, forming carbon dioxide, and heat is liberated. Part of this heat is reabsorbed when the dioxide, in the presence of additional carbon at a high temperature, is converted into monoxide. The steam or water vapor reacts with the hot carbon, forming carbon monoxide and free hydrogen. This reaction also absorbs a portion of the heat liberated in the hot zone. The hydrogen passes up through the fuel bed and a part

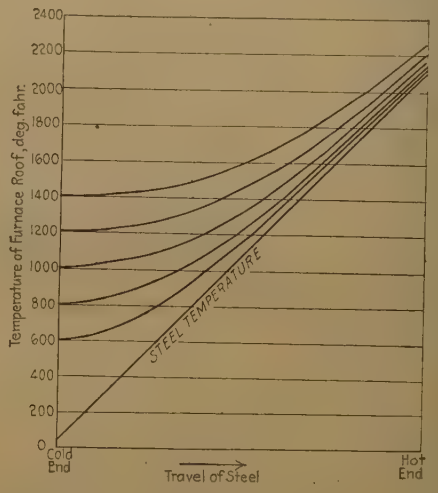


Fig. 4. Roof Temperatures Required to Give Equal Heat Transfer at All Points in Continuous Billet Heating Furnace

of it may combine with carbon to form methane. The other portion enters the final gas in the free state.

Volatile matter contained in the coal charged is driven off almost immediately after the introduction of the fuel at the top. This appears in the analysis as free hydrogen and hydrocarbons, saturated and unsaturated, the latter in proportions dependent largely upon the temperature of distillation. Low temperatures favor the formation of tarry vapors, which condense under reduced temperatures in the flue and deposit soot, while high temperatures favor the formation of fixed gases, such as methane. In any case, however, the proportion of condensible vapors is small.

Incombustibles, nitrogen and carbon dioxide, comprise about 60 per cent of the total volume. The nitrogen present, neglecting the small quantity driven from the coal is derived from the air blown. The carbon dioxide may vary considerably with the operation, and gives an excellent indication of the efficiency of the process. A high percentage may indicate a thin fire or a relatively cold producer. The latter may be caused by slow running or by an excessive use of steam. High hydrogen content also points to the use of too much steam.

Both heat-liberating and heat-absorbing reactions

occur in the producer. The quantity of heat liberated exceeds the heat absorbed; the difference raises the temperature of the gases generated. The temperature is maintained within desired limits by proper control of the steam supply, in relation to the air blown. The normal temperature is about 1,100 deg. Fahr. The total heat of the gas is more than 150 B.t.u. per standard cu. ft., and approximately 70 cu. ft. are produced per pound of coal used. The weight of the gas is about 0.9, referred to air.

Combustion of the Three Gases

As indicated above, these gases are mixtures of carbon monoxide, free hydrogen, hydrocarbons and incombustibles. The first three named components have stored-up energy in the form of latent heat, liberated when they are acted upon chemically by oxygen. When they are brought into intimate contact with air at high temperature and in proper proportion, combustion takes place.

The chemical reactions are not complex. Carbon monoxide combines with oxygen from the air to form carbon dioxide; hydrogen combines with oxygen to form water vapor; the hydrocarbons combine with oxygen to form both carbon dioxide and water vapor. Each of these reactions is accompanied by the liberation of heat. When sufficient air is supplied, complete oxidation and maximum heat liberation take place. No other compounds are formed, in considerable quantities, in the process of combustion. The products of perfect combustion contain these two gases and, in addition, the nitrogen content of the air used for combustion, and the carbon dioxide and nitrogen from the original fuel. The greater portion of the liberated heat immediately raises the temperature of the products of combustion. Part of the heat may be re-absorbed or dissipated to the furnace walls. The temperature to which the remaining heat is able to raise the products of combustion is called the combustion temperature.

For various reasons, it is almost impossible to derive the real temperature of combustion from the gas analysis. The so-called theoretical temperature of combustion is sometimes used in comparing gases and, for relative values, gives satisfactory results. This is the temperature which would be obtained if all the heat liberated were used to heat the products of combustion. We have roughly calculated this value for the various gases, as shown in Fig. 1. The curves show the sensible heat capacity of products of perfect combustion at given temperatures. The ordinate, representing the sum of the latent and sensible heats of the fuel gas, and the sensible heat of the air, all above 0 deg. Fahr., has a corresponding abscissa which gives the theoretical temperature of combustion.

High combustion temperature is favored by high proportion of combustibles in the fuel gas, because of the greater heat available for a given quantity of combustion products. We may naturally expect a high combustion temperature with coke oven gas, practically free from incombustibles, compared with furnace gas, which has less than 30 per cent of its volume in heat-bearing constituents. Proper regulation of the air supply also promotes high temperature of combustion. For every gas, there is a theoretical quantity of air required for complete oxidation, which may be calculated from the chemical analysis. In actual operation, complete combustion under these conditions is never obtained.

Gases are sometimes valued commercially according to net calorific power. If it were possible to reduce the temperature of the stack gases to that of the atmosphere, this valuation would be more consistent. Unfortunately, this operation is not practicable, and combustion is always accompanied by a stack loss. The calorific power of a gas is a direct measure of the heat liberated in the furnace under the best conditions, but the composition of the gas largely controls the quantity of heat passing out with the waste gases, other conditions remaining the same. Each gas has an inherent stack loss. The difference between the net calorific power and the stack loss gives the heat available, and this figure should be used in any attempts at commercial valuation.

Specific conditions affect the relative value of gases on various operations. Fig. 2, giving the percentage of net calorific power available for the three gases, with various stack temperatures, shows that the effect of incombustibles on stack loss is accentuated by increased stack temperatures. In view of the foregoing, it is natural to expect the wide divergence of points representing high stack temperature conditions, and the close approach to a common value, at points representing low stack temperatures.

Contact Between Gas and Air

There are at least three general methods employed to bring the gas and air into direct contact. The two fluids may enter the furnace or combustion chamber

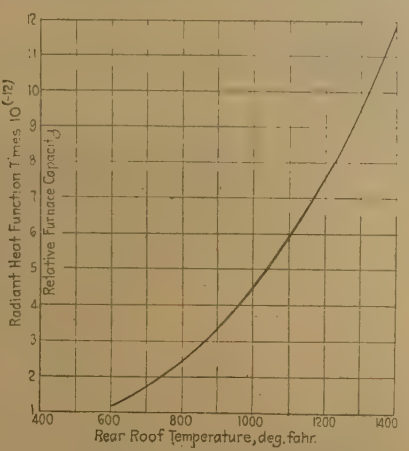


Fig. 5. Furnace Capacity Corresponding with Various Rear Roof Temperatures

through separate ports at relatively low velocities. In this case, at the beginning of the travel across the furnace, the air and gas pass in separate lanes, mixing taking place only at the plane of contact between the lanes. The combustion along this surface causes a disruption of the stream line flow, and the speed of combustion may be accelerated continuously until the gases reach the outlet port. By means of bridgewalls and irregularly-shaped roofs, the stream line travel may be further broken, further increasing the speed of combustion.

The air, which is heavier than most gases, may be introduced above the gas; after entrance, its general downward travel causes it to engage the gas and cause further mixing. This general method of operation produces the "lazy flame." It has had long and successful usage and is easy to manipulate. It has the advantage of producing the "mild" or "soft" flame, and of producing a flame of great length, resulting in direct radiation from the flame to the steel over all sections of the furnace. In some cases, particularly in slab furnaces, the flame also finds its way under the steel, resulting in direct radiation to the under side.

The greatest objection to this method of operation is that it causes delayed combustion which results in high stack temperature and loss. The rather indifferent mixing frequently permits incomplete combustion, even with an excess of air supplied to the furnace.

Another method of introducing air and gas provides for the impinging of the two streams upon each other at high velocities. This disturbance causes a random motion of the elementary volumes of which the air and gas are composed, and increases the probability of direct contact. To carry out this principle more fully, the air and gas are sometimes divided into a number of impinging streams, causing complete mixing in a shorter travel.

This last method employs the eddy-flow principle to cause the mixing action. For every gas or mix-

ture of gases, flowing through a given conduit, there is a critical velocity which marks the change from streamline flow to eddy or turbulent flow. At lesser velocities the mass of fluid proceeds in straight lines, while at greater velocities a whirling motion is set up. It is natural to expect that, if the fluid mixture traveling above the critical velocity were composed of quantities of air and fuel gas, a thorough mixing action would be obtained. The completeness to which any mixing is carried depends upon the line of contact between the components. The whirling flow gives a long line of contact in a short travel.

In general, the effort required to produce proper mixing depends upon the richness of the gas. Poor gases have a high percentage of incombustibles, and the presence of these inert constituents decreases the probability of direct contact between the important constituents.

Perhaps the best method of mixing the air and gas is to combine the second and third plans, obtaining a mixing action due both to the impinging of streams at high velocities and to the action of the turbulent stream. The air may be supplied to the port or burner under external pressure, or it may be forced in by the impact of the gas, by the stack draft or by both. The specific conditions determine which means is most suitable. When conditions permit, it is advisable to use the aspirating burner, which draws in air for combustion, due to the impact of the gas mass. Its use is limited but, within its own field, excellent operation is obtained with a minimum of attendance.

Use of the Aspirating Burner

Aspirating burners, properly designed and applied, will give the desired condition of constant air-gas ratio. Certain factors should influence the design, and definite methods be employed in obtaining the given air-gas ratio. It is not contended that adherence to these principles will yield a burner which will function perfectly, but, with this method as a starting point it should be possible, with the aid of experimentation, to proceed to the construction of a real, constant-ratio aspirating burner.

Fig. 3 shows the aspirating burner in its simplest form. A jet of gas issues from the gas pipe into the mixing pipe, which is open at both ends. Due to the impact of the gas stream, air is drawn into the mixer in contact with the gas. The mixture passes through the mixing pipe at a velocity exceeding the critical speed, and a turbulent motion is set up, thoroughly mixing the gas and air components. Passing to the furnace, this homogenous mixture is ready for rapid combustion.

Assuming no loss in energy due to friction, eddy currents, etc., the ratio of air to gas is a function of the ratio of gas pipe and mixer pipe areas, and is independent of gas velocity. Further, with a given burner, the mixture ratio is substantially constant for all gas velocities within reasonable limits.

Obviously, such a burner would automatically adjust the air supply to the varying gas supply as long as the gas composition and temperature remain the same. This feature admirably fits the conditions under which blast furnace gas is supplied. Usually, as no attempt is made to keep it constant, the pressure of blast furnace gas is subject to considerable and frequent variation, due to the variation in the rate of gasification through the cycle of furnace operation.

Successful application of the aspirating burner is limited by the momentum available in the gas stream, for a given weight of mixture. Gases with a high percentage of incombustibles are heavier and require less air than the richer gases. The use of a burner of this type is limited to poor gases, and particularly to blast furnace gas. This appears to differentiate against its use on coke oven gas for, with the large mixing tube which would be required, it would be impossible to transfer the energy of the small gas stream uniformly to all parts of the mixture stream.

Heating Steel in Continuous Furnaces

The continuous billet-heating furnace presents some interesting problems relating to heat transfer. The furnace bottom is almost completely covered by long billets placed transversely. In the charging operation, as each cold bar is pushed in at the rear of the furnace the entire charge is advanced, the forward bar having been previously withdrawn for the mill. The continuous furnace may be described as one in which the steel, as it progresses slowly from the cold end of the furnace to the hot end, is subjected to a gradual and uniform rise in temperature.

In many furnaces of this type, due to careless operation, the temperature of the steel rises but slightly in passing over the first half of the course, and the greater portion of the heating is accomplished in the third quarter of travel. The last quarter is used as a soaking area, in which the heat on the upper portions of the steel is allowed to pass to the inner and lower portions. In other cases we find the rise in temperature more uniform over the entire length of steel travel. It is interesting to study the conditions necessary to produce this gradual and uniform temperature rise, particularly since, as will be freely admitted, this is the best method of operation.

Since the temperature rise of the steel must be substantially uniform, the rate of heat transfer to the steel must be equal over all sections of the furnace. If we neglect the transfer of heat to the steel by convection it may be assumed that all of it is transferred by radiation from the flame or roof. Since the rate of heat transfer to the steel must be the same in all sections of the furnace, the difference of the fourth powers of the absolute temperatures of the flame or roof and the steel must be constant, in all sections. Now the roof temperature is necessarily less than the flame temperature, and in combining the two radiant values, the effective temperature must be used. For convenience, this temperature will hereafter be referred to as the roof temperature.

Referring to a specific case, let the steel enter the furnace at 60 deg. Fahr., and be subjected to a uniform temperature rise until it is discharged at a temperature of 2100 deg. Fahr. Since the rear end temperatures are lowest and most easily reckoned with, we use them for a basis in calculation. Assuming a rear end roof temperature, and recalling the temperature range of the steel, we may readily solve for the radiant heat transfer characteristic, the difference of the fourth powers of the absolute temperatures of the roof and steel. This is comparable to a force which drives the heat from the roof to the steel.

Having this function properly evaluated it is possible, by reference to the desired steel temperatures at the various points in the steel travel, to determine the corresponding roof temperatures required at these points. This yields a series of roof temperatures which, under the assumptions, will give the condition of uniform steel temperature rise as required. This procedure was followed in plotting the curves shown in Fig. 4, one curve being drawn for each assumed rear roof temperature. Along each curve the driving force is constant. Each curve represents a constant rate of heat transfer, and therefore a definite furnace capacity.

Further, in Fig. 5, a curve has been plotted to show the relation between the rear roof temperature and the capacity of the furnace operating under these conditions. It appears in this case rather unusual to find that the furnace capacity with a rear roof temperature of 1400 deg. Fahr. is ten times as great as the capacity obtained with a rear roof temperature of 600 deg. Fahr. It may appear perhaps more unusual to find that a similar capacity ratio is obtained with front roof temperatures of 2263 deg. Fahr. and 2120 deg. Fahr., respectively.

Attention is called on Fig. 4, to the wide divergence of points representing conditions at the rear end of the furnace, compared with the proximity of the points representing the front end conditions. This indicates that the furnace capacity may be considerably increased by a slight rise in temperature of the roof at the hot end. Again it may be seen that, to effect considerable heat transfer at the rear end of the furnace, a wide divergence of roof and steel temperatures is necessary. This may add weight to the

statement that the combustion temperature is extremely important. It may also give a clearer explanation of the low furnace efficiency caused by the high rear gas temperature necessary to provide the high rear roof temperature required.

Roof Length and Capacity

The proper length of roof is often in question. Clearly, the addition of furnace length cannot well be used to reduce appreciably the stack gas temperature. From Fig. 5 it may be seen that the heat transfer is seriously compromised by reduction in temperature at the rear end. This indicates that an enormous increase in furnace length would be required to reduce appreciably the stack gas temperature. The fact that a vast expanse of low temperature roof at the rear end is not particularly effective is undoubtedly well known to furnace manufacturers.

If it were possible to obtain reasonably low stack gas temperatures by making a moderate increase in the furnace length, this method would have been resorted to long ago. Instead of this, we find the general use of recuperators. These are built to absorb heat from the waste gases and transfer it to the air supplied for combustion. Perhaps no part of the furnace presents so many operating difficulties as the recuperators; and in some cases these have been discarded because the saving in heat did not justify the expense incurred in their proper maintenance. Of course, when it is necessary to preheat the air in order to maintain the required combustion temperature, this reasoning does not apply; but the use of recuperators on billet heating furnaces admits the failure of the longer furnaces in reducing the stack gas temperature.

Other conditions remaining the same, the length of the furnace determines its capacity. It might be thought that the furnace capacity is limited only by the extent to which the radiant heat function or driving force can be increased. The latter is limited in two ways. At the hot end, the roof temperature must not exceed the fusion temperature of the best refractories. The other limit is measured by the rate at which the steel will allow heat to be conducted through its mass.

If the transfer of heat to the steel exceeds the conductance of heat through the steel, there will be a non-uniformity of temperature in the steel cross-section. If this condition is allowed to prevail for a sufficient length of time, the inevitable result will be the fusion of the steel section. Such operation not only ruins the structure of the bar, but seriously impedes the continuous operation of the furnace.

We may therefore say that the capacity of a given furnace is limited by the capacity of the steel to conduct the heat from its upper surface to its inner and lower portions. After this point is reached, the capacity may be increased only by the addition of furnace length. It seems wise to make the length sufficient to give the desired capacity when the rate of heat transfer from the roof to the steel is near the maximum rate of heat conductance through the steel.

Globe Seamless Tubes Co. to Pass to New Ownership

Negotiations are under way and are expected to be completed soon for the sale of the Globe Seamless Steel Tubes Co., Chicago, manufacturer of steel boiler tubes and mechanical tubing, works of which is at Milwaukee. William Renshaw, Chicago, president, and Lawrence Fitch, Milwaukee, vice-president and secretary, principal owners of the company, will retire. The new interests will be headed by Robert P. Lamont, president, the American Steel Foundries, Chicago; Paul J. Kalman, St. Paul, Minn., president, Paul J. Kalman Co. and also of Bliss & Laughlin, Inc., and the Hudson Motor Co. of Illinois; and by Frank J. O'Brien, present vice-president and general manager of the company, who will continue in active charge of the business.

Proposed Alabama Iron and Coal Merger

A merger of Alabama iron and coal properties is reported to be under negotiation. The Alabama Co., owning the two Clifton blast furnaces at Ironaton, Ala., and the two Etowah furnaces at Gadsden, Ala., is the only company whose name has been mentioned, but four or five companies, in all, are being considered. Negotiations are being conducted by Lloyd H. Atkinson, whose office is with Crocker Brothers, 21 East Fortieth Street, New York. Mr. Atkinson was for some years with the Bethlehem Steel Co., and later was a member of the firm of Atkinson & Utech, railroad supplies.

The Alabama Co. owns about 1750 acres of land at Gate City, Ala., containing deposits of red iron ore, limestone and dolomite. Hard ore mines have been opened on this property at Hammond, Ala. About 2500 acres of mineral lands and 15,000 acres of timber and other lands were acquired with the Clifton furnaces, and 730 acres of ore and other lands with the Etowah furnaces. The company has about 3700 acres of land near Gadsden containing deposits of red iron ore and a large acreage of land containing brown iron ore. Mines have been developed on these properties with a daily capacity of 600 tons. At Hematite, Ga., the company owns 1700 acres of brown iron ore lands with ore washers. Coal mines and coke ovens are operated at Lewisburg, Searles and Brookwood, Ala. There are 915 beehive coke ovens at one place and 350 at another. The total annual capacity of the coke ovens is 300,000 tons. About 300 acres of limestone lands are also owned by the Alabama Co.

The statement has been made that if the pending merger plans are carried out there will be a saving of 40 to 50 cents a ton in the cost of making pig iron, economies being effected chiefly through reduction in the length of ore hauls. Stockholders of the Alabama Co. have already been asked to give their assent to the proposal.

Union Sued Under Recent Decision

Suit to recover $5,000 damages as a result of injuries received at the hands of striking union molders in Cleveland, was brought last week against the Cleveland local of the International Molders' Union of America, under the ruling of the United States Supreme Court in the Coronada case. The president, business manager and secretary of the union were named as co-defendants in the suit which was started by a molder who claimed to be the victim of an attack by union strikers.

Decision as to Reconsignment

WASHINGTON, July 18.—Passing upon the complaint of the Romann & Bush Pig Iron & Coke Co., St. Louis, Examiner Warren A. Wagner, in a tentative report to the Interstate Commerce Commission, finds not to be unreasonable or otherwise unlawful the reconsignment rule of carriers permitting only one change in destination. It was charged that failure of the Western Maryland and other carriers to permit more than one reconsignment, and apply the through rate from points of origin east of the Mississippi River on shipments of coal and coke by way of the reconsigning points to final destinations in the far west and southwest violated the fourth section of the interstate commerce act.

The Commercial Galvanizing & Mfg. Co., Warren, Ohio, has begun the erection of a new plant in the industrial allotment in the northeastern section of Warren, adjoining holdings of the Warren Tool & Forge Co. It will manufacture large and one-time containers as one of its chief products, used by petroleum companies, tar producers and other manufacturers in transportation of their materials. A galvanizing department will be maintained in conjunction.

Horizontal Press for General Work

Wide range of ram speeds and unusual readiness of the ram to respond to movements of the control handle are said to permit the new self-contained horizontal press of the Oilgear Co., Milwaukee, shown in the illustration, to be used effectively on many different kinds of work.

The particular press shown is used in the saw mill department of the Allis-Chalmers Mfg. Co. on general work, such as pressing wheels on the axles for saw mill carriages, pressing heads into pipe rollers and a variety of odd jobs. The capacity is 25 tons at pressing speeds varying from ¼ to 6 in. per min. The maximum speed of ram travel out to the work is 37 in. per min.

Self-Contained Horizontal Press for General Work. Wide range of ram speeds is a feature

and the return speed is 56 in. Ram speeds are changed instantly by means of the control handle located on the top of the standard variable-stroke QC pump, as shown. The stroke is said to begin without shock, and the push to be steady and without pulsations.

The pump is driven by a 2 hp. constant-speed, electric motor; no accumulator or auxiliary pump being required. Overload relief valves are provided to permit the ram to be driven at full speed against a stop without danger of injury. The cylinder is 9 in. in diameter and at full capacity a pressure of 800 lb. per sq. in. is exerted on the ram piston head. The large diameter of the ram, 5¼ in., and the long guide, is said to eliminate any tendency of the ram to deflect, even on its maximum stroke of 30 in. The axis of the ram is 32 in. above the floor and the space between the stop supports, 24 in. The V-shaped stops provided can be located along the supports at regular intervals and are held in place by heavy steel pins.

Among the advantages claimed for this type of press, are that power is not wasted in maintaining pressure for an accumulator or for pumping fluid through by-pass valves; the power efficiency is high over a wide range of ram speeds; no adjustments are necessary to keep the machine in normal operating condition and it is not damaged by overload.

Wages of Sheet Mill Workers Advanced

YOUNGSTOWN, July 18.—Tonnage rates of sheet mill workers employed by Middle West makers subscribing to the sliding scale agreement of the Amalgamated Association of Iron, Steel & Tin Workers will be advanced 3 per cent of the base rate, for the July-August period, as a result of the bimonthly examination of sales sheets conducted July 12 at Youngstown.

The average price of Nos. 26, 27 and 28 gage black sheets shipped during the 60 days ending June 30 was disclosed to be $2.90 per 100 lb., an increase from $2.80, the average two months before.

Under the new rate, sheet mill employees will be paid 22½ per cent above base, as compared with 19½ per cent in May and June.

The average price indicates that the higher quotations recently prevailing applied only to a small percentage of the total shipments. The current independent sheet market, however, is from $5 to $8 per ton higher than the average disclosed by the examination, as quotations range from $3.15 to $3.30 on base gage sheets.

Indications therefore point to another advance for affected workers at the next settlement.

The examination also disclosed an average price of $4.65 for tin plate, per base box of 100 lb. coke primes, unchanged from the settlement two months ago. Tonnage rates of tin mill workers are therefore unaffected and continue at 23 per cent above the base, the same as for May and June.

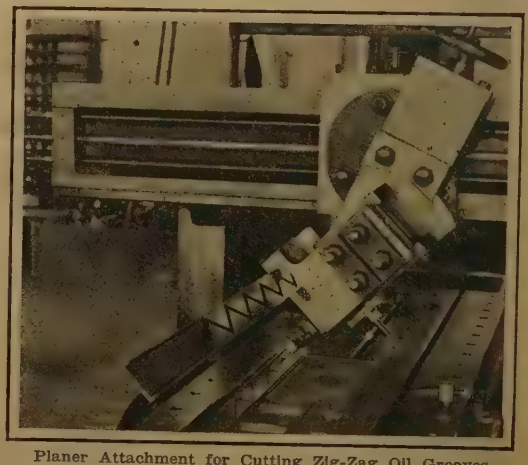
Current tin plate quotations are nominal at $4.75 per base box, or $2 per ton higher than the settlement average.

Ziz-Zag Oil-Groove Planing Attachment

ALLEN P. CHILD

A device used as an attachment on planers, for cutting zig-zag oil grooves in slides, and of interest because of the manner in which it cuts the grooves, is shown in the accompanying illustration. The groove is V-shaped, with a total angle of 120 deg. and because this form gives the oil an opportunity to wedge itself between the wearing surfaces, it is claimed that it is superior to a half-round section groove.

The cutting device is mounted on the clapper of the planer and is locked so that it cannot be lifted. The grooving tool is carried by a small clapper-box mounted on a cross slide, and its position on this slide is adjustable. One end of a bar cam, fitted in the body of the device, is attached to an upright strapped to the planer table so that it moves with the work. Freedom of



Planer Attachment for Cutting Zig-Zag Oil Grooves

movement of the planer head carrying the device is possible to a great extent through connection being made by both horizontal and vertical slides. As the planer table travels, the follower in the cam groove reciprocates and the motion is transmitted to the grooving tool.

Civil service examinations are announced for mining engineers at $3,600 and upward, and associate and assistant mining engineers at $2,160 to $3,600; for junior mining engineers at $1,620 to $2,160, and for assistant sanitary engineers at $2,320 to $3,225 per year. The two latter classes will be examined Aug. 9; the other applications will be received by the Civil Service Commission, Washington, until further notice. Applicants should ask the commission for form 2118 (mining engineer or associate or assistant) or 1312 (junior mining engineer or assistant sanitary engineer), stating the title of the examination desired.

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ESTABLISHED 1855

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A Decision for War

Reading the declaration of some of the coal operators and the official reply of the miners' union to the proposal of President Harding stamps anew on the mind of the reader the intense militancy that so long has marked the handling of labor issues in the coal industry. Some of the published complaints against the Administration that have had the evident sanction of operators find fault because the Government did not put itself behind the operators' proposal to the miners for a new grouping of districts. That is not far from the miners' insistence in their reply to the President that the only thing for the operators to do to avert a catastrophe is to meet the miners' representatives in interstate conference.

If there is to be arbitration of the coal strike, the issues must be handed over to the arbitrators for decision, and in questions so bitterly contested as are those which have caused the present deadlock, the outcome of necessity will be such as will suit neither side. In spite of all that has been said of the necessity of such thoroughgoing work by the proposed commission as shall "establish the proper basis for the future conduct of the industry," it is idle to look for any magic formula to right conditions under which coal mining has been going from bad to worse year after year. The way back will be long and hard, both for operators and miners, even though the war that has already cost many lives were to end to-morrow. Meanwhile, such a commission as the operators failed to support as offered and as the miners' committee rejected outright should be appointed and proceed with its work.

In the phase of the struggle on which the country is now entering the immediate interest of the public is in getting coal from the mines. A majority of the operators have expressed a willingness to have work resumed even though for a time at wages that represent the highest point of post-war inflation. The strikers, while with lip service "alive to the necessity of immediate resumption of coal mining operations," stand opposed to any efforts in that direction except on their own terms. Thus they are arrayed against the public interest and against the Government's plan for the opening of the mines and must now reckon with opposing forces more powerful than any they have had to meet in all the privation of more than 15 weeks of idleness. The public earnestly wants peace in the coal industry and peace with justice; but it appreciates that the conflict will be more serious before the way can be opened for peace.

Stand by the President

The patriotism of home is as imperatively necessary as the patriotism which sends soldiers to fight a foreign foe. It is easier to be patriotic when fired by hate of the Hun and love of country than it is to fight one's own countrymen. But Sheriff Duval and his little band who marched up the West Virginia hill were serving the cause of liberty and democracy just as truly as were the American boys who fought in Flanders or the Argonne; for if a man is not free to work in this country without getting permission from a labor union, there is no liberty and democracy is a farce.

Eugene V. Debs, the same Debs who was justly sent to prison for doing his utmost to prevent this country from winning the great war, has now added ingratitude to his other offenses by trying to make it more difficult for President Harding, who pardoned him, to enforce the laws of the United States. Debs sneers at the Government again as he did before a jury found him guilty and, whether legally or not, he is morally as guilty to-day as he was in the time of the other war, for to-day a few men are making war against the sacred rights of all men and Debs is helping them.

When Debs and his kind defy the Government, no patriot ought to hesitate as to where he stands. During that other war in 1917 and 1918, President Wilson and the Labor Board, headed by William H. Taft, made many concessions to labor. It seemed necessary to them to do so because determination to win the war dominated all other considerations. We do not know whether history will say they were right, and it would be useless to argue that question now. Conditions have changed. No one can now claim that in order to establish the right of men to work it is necessary

to submit to the demands of a labor dictator. Temporizing can not go on forever. The time to take a definite, positive stand for principle has come. The wise labor leaders have no sympathy with anarchy and socialism, and a tremendous majority of those who work for wages are patriotic. The President of to-day is in a much stronger position than was the President of 1917-18; but President Harding needs and should receive the heartiest, most effective support possible. Some critics are saying that he did not act soon enough—that he should have acted before the railroad strike and before the coal strike. Possibly that is true; but no good purpose will be served by discusssing that criticism. The present duty is to stand by the President in any drastic step he may take.

President Harding has had little more than a year in his great office. He is naturally conservative and slow to act until he knows he is right. In that respect he resembles our greatest President. He is courageous and God-fearing, and will do what the good of the country requires and his conscience commands. To doubt that the people will support him would be to question the stability of our Government.

Unjust Iron Ore Rates

Early in April of this year THE IRON AGE called attention to the deplorable conditions under which producers of iron ore in Eastern States were laboring, owing to the suspension by the Interstate Commerce Commission of the proposed reduction of 28 per cent in freight rates and handling charges on Eastern ores which had been filed to become effective April 1. At the same time the proposed reduction of 20 per cent on ex-lake rates was suspended, the suspension in both cases extending until July 30. The low rates on foreign ore from seaboard to inland furnaces continued, and operators of Eastern iron mines declared that it would be impossible for them to compete with foreign ores. One Eastern steel company had then contracted for a cargo of foreign ore, and the same company has since contracted for 150,000 tons and negotiations for other tonnages are pending.

Month after month dragged along without the Eastern ore operators obtaining any relief except the general rate reduction of 10 per cent on all iron and steel products, but it was hoped that before July 30 a substantial reduction would be made in the Eastern rates. On Monday of this week, however, the Interstate Commerce Commission suspended until Aug. 29 the tariffs which represented a reduction of 20 per cent on ex-lake ore rates and 28 per cent on Eastern ore rates. It was stated that the suspension was ordered because the commission had not completed its hearing in these cases.

A few concrete examples will show the handicap of the Eastern producers. The pre-war rate on ore from Ringwood, N. J., to Pottstown was $1.12. This was increased 100 per cent to $2.24, which continued until the recent reduction to $2.02. Foreign ore, coming to this country pays less than half of this freight, the usual rate from seaboard to Eastern furnaces ranging from 90 cents to $1.

The rate from Buffalo to Hellertown, Pa., over 300 miles, is $1.94, but the rate from Ringwood to Hellertown is $2.02. This is one instance of the way the producers of ore in the Eastern States are suffering, not only from foreign competition, but from discrimination in favor of Lake Superior ores which, in many cases, have lower rates on long hauls than the Eastern mines have on short hauls.

Under these conditions it is no wonder that some Eastern mines are idle and have been for months, and that at others production is greatly reduced. The latest action of the commission will insure further losses and further suspension of activities. It is difficult to understand the position that body has taken.

Magnetic Testing in Welding

The rapid advances made in welding operations have emphasized the necessity for a reliable method of checking the quality of such welds. The joining of ships' hulls, of tanks and of other large steel fabrications by welding instead of riveting is gaining in favor. Investigations have been made recently which have an important bearing on the future of large welding undertakings. At the annual convention of the American Society for Testing Materials last month a paper was presented, abstracted elsewhere in this issue, which makes public some highly interesting results. According to the authors, who compare magnetic and electrical testing of steel welds, the former, as applied to butt-welded steel plates, affords strikingly uniform and reliable results in detecting the quality.

In recent years magnetic testing of steel has acquired large commercial importance, particularly for rails. Only last March its successful application to the testing of chain was made public. Its special advantage lies in the fact that actual metallic contact with the metal to be tested is not necessary, nor even the removal of scale or dirt.

The recent experiments here referred to emphasize the commercial importance of such a method of testing, for if poor welds can be quickly detected then the use of welding may safely be extended. The possibilities are large. There is also the consideration that magnetic testing is really the only means by which the completeness of the heat treatment of a product can be determined without destruction of the object examined. As the applications of heat treatment increase, magnetic testing is certain to gain in importance.

German iron and steel exports have been holding up more nearly to the rate of the second half of 1921 than might be inferred from some reports. The latest data from *Stahl und Eisen* show 200,676 metric tons for April. This makes the average for the first four months of the year 201,800 tons per month, against about 220,000 as the average for the second half of 1921. In the first four months of this year exports from the United

States were only 175,600 tons per month. Great Britain and Germany, therefore, outrank this country. A feature of the German foreign trade is the large importation of scrap. In April the total was 35,120 tons, the largest for any month so far as recent data go, bringing the total to 98,600 tons to May 1, nearly equal to the entire receipt for all of 1921. The necessity of lowering costs by the use of cheap raw materials accounts for this rapidly increasing movement.

A Better Philosophy of Work

The large labor turnover in most industries, the disposition to go on strike, and the disinclination of many wage earners to do a full day's work, all have a common origin—a philosophy of work that work in itself is objectionable and naturally is to be avoided as far as possible. Recognition of this fact, in the abstract, is probably general enough, but hope that the philosophy of work can be altered and improved is not as great as it should be.

We began our misconception of work as early as we could by misinterpreting a line in what is only the third chapter of the Old Testament: "In the sweat of thy face shalt thou eat bread," and the united testimony of medical men that sweating is healthful has not altered our philosophy of work. Through the centuries the philosophy thrived and "the dismal science," the old political economy, put a broad stamp of approval on it.

It is unnecessary to argue that when workmen demand higher wages and when they shift employment a strong motive is the desire to avoid work, as this fact is commonly admitted. The abstract principle that work ought to be made more pleasant is, moreover, generally recognized. The difficulty lies in the practice, not in failure to observe the principle. The practice tends to the treatment of symptoms rather than to attack upon the disease or cause.

The study must go to the very seat of the emotions that cause work to be considered irksome. The seat is deep in the mind of the workmen, below his consciousness, indeed. As he does not himself understand the mental processes by which work appears irksome to him, it is quite idle to appeal to his judgment. From this viewpoint it is not straining a point to call "collective bargaining" by the simple word foolish. There are various arguments in favor of collective bargaining, and this reference does not combat those arguments. Anything of that sort, done with the avowed purpose of making the surroundings or circumstances of employment more attractive, serves by that very token to emphasize the conception in the mind of the worker that the work itself is disagreeable.

The rather common notion that it is only work of certain descriptions that can be really agreeable to the worker will not bear the test of study. To illustrate, if an instant answer be demanded to the question whether there is joy in the production of an oil painting, the average man will confidently answer in the affirmative, yet questioned further the great majority of men would admit that they would not care to be painters. One has merely jumped to the conclusion by observing that many men have painted without making a decent living from the work. If some men have put their whole souls into painting and other men would find such work most irksome, is it reasonable to assume that other lines of work cannot become tolerable, even pleasurable, through the creation of a different mental attitude?

If we are not on the threshold of important discoveries and applications, by way of creating a new viewpoint and philosophy of work, instead of attacking symptoms in endeavoring only to improve the surroundings of work, we are most unfortunate. The demand for a "living wage" in terms of commodities that are not available in the aggregate cannot easily be downed. It can be met only by increasing production so that the commodities the "living wage" would purchase at present prices can be had. Otherwise increasing wages merely increases the competition of buyers for the commodities available.

Cement and Steel

Cement and steel as measures of business activity are much alike in some respects and entirely different in other respects, hence a glance at movements in both materials discloses facts as to business conditions which a study of but one of the materials would not show, just as in algebra a single equation with two unknown quantities cannot be solved, while with two equations complete solution is possible.

Cement is practically altogether a construction material, while steel is only in part a building material. The commodities are wholly different in this, that steel can be and is stocked by distributers and consumers while cement is not. Stocks of cement are necessary, to take care of the wide seasonal variations in consumption, but this stocking is done by the producers, who endeavor to maintain a moderately uniform rate of production, while the rise and fall in stocks takes care quite largely of variations in shipments. The Geological Survey presents monthly statistics of production, stocks and factory shipments, which show that shipments in the summer months may be two, three, or even four times as great as shipments in the winter months.

The use of cement—which nowadays means practically Portland cement—is relatively new. Up through the year 1902 production doubled almost every year or two, that of 1902 being 17,230,644 barrels. Then successive doublings occurred in 1905 and 1910, the increase thereafter being substantial, but reasonably moderate. The best pre-war production was 92,097,131 barrels, in 1913.

Comparing 1913 and 1920 conditions one finds a departure between cement and steel, cement production increasing 8½ per cent while steel production increased 35 per cent. Comparing 1920 and 1921 we find a greater departure, in the other direction. Cement went off only 5 per cent while steel went off 53 per cent.

These remarkable departures can hardly be ascribed to accident or to changes in conditions affecting the two materials differently. Un-

doubtedly, of course, the activity in road building in 1921 helped cement much more than steel, but that would not account for everything. The statistics furnish strong ground for the suspicion, which is justified also by various other considerations, that there was a large carry-over of steel from 1920 to 1921, whereby the steel consumption of 1921 was much greater than the production.

The figures tend to support the suspicion. The combined output of 1920 and 1921 in steel was precisely double the output of 1913, while in cement the two-year production was 6 per cent more than double the 1913 output. It is much easier to believe there was a large carry-over in steel and manufactures of steel from 1920 to 1921 than to believe that in 1920 everybody was busy using steel and cement, but in 1921 they confined their attention to cement.

In the present year the shipments of cement have been 13,218,000 barrels in the first quarter and 34,811,000 barrels in the second quarter. Allowing seasonal variation in shipments this year to follow last year, the indicated shipments for the whole of 1922 would be 107,000,000 barrels, or 7 per cent over the record of 1920 and 16 per cent over the amount in 1913. Whatever may be the cause, the relation between production in 1913 and production or shipments this year is approximately the same for cement and steel. The similarity suggests that steel used for construction work and steel used for other purposes are in no greatly different relations from those of the past.

CONSIDERING FOREIGN IRON

Quotations Under American Market But No Analysis Guarantee Is Obstacle—Japan Again Buys Rails

NEW YORK, July 18.—Activity in purchases of rails, both T and grooved type, by Japan continues strong, and black sheet inquiries and purchases are on the increase. One black sheet inquiry now current among Japanese houses is for about 600 tons of light gage. The recent inquiry by the city of Tokio for five miles of 92-lb. grooved rails is reported to have gone to the New York branch of a large Japanese import and export house. The tender of the South Manchuria Railway Co. calling for about 6800 tons of 100-lb. rails was placed with Suzuki & Co., 220 Broadway, New York. An American exporter dealing with Japan recently booked an order for 1000 tons of 12-lb. rails, of which 800 tons have already been placed with a mill.

The Imperial Steel Works, Yawata, Japan, has completed construction of its tin plate mill, says a report of the American commercial attache in Tokio. While the estimated capacity of the mill is 20,000 tons annually, the first year's production is not expected to exceed 6000 tons.

The Bancroft-Jones Corporation, Buffalo, N. Y., reports receipt of a contract from the Truxillo Railroad Co., New York, for a number of steel buildings, involving about 700 tons of structural steel, for use in Honduras.

The rising cost of pig iron in the American market is the cause of considerable interest now being shown by consumers in foreign iron. There are prospects of Belgian, French and Scotch iron being brought in. One importer in New York reports that he is offering a pig iron of Belgian origin, analyzing silicon 5 to 6 per cent, and phosphorus 1.80 to 2 per cent, at $22.25, c.i.f. New York, or other Atlantic port. The greatest obstacle to purchases of foreign irons seems to be the inability or unwillingness of foreign sellers to give a guaranteed analysis.

In a recent report on conditions of trading with Brazil forwarded to the National Foreign Trade Council, New York, the American Chamber of Commerce at Sao Paulo, Brazil, says: "It seems to be generally agreed that the worst of the crisis which has existed for the last two years has passed, but it is also felt that a great deal of care and effort must be exercised before conditions can resume their normal state. However, the situation is far from hopeless, and instances can be cited where customers are ready and anxious to buy American goods, admitting that the price in dollars was all that could be desired, but positively refusing to consider placing an order until exchange has improved. In these cases the importers are not buying European goods, but insisting that they will wait for American."

In referring to the exchange situation, the report says: "It might be borne in mind that under existing conditions not only is the cost of goods doubled in the local currency, but the importer has also to contend with an increase in duties of approximately 100 per cent, due to the advance in the gold rate. For those with any intention or inclination to invest money in Brazil in the form of local manufacturing, it would seem that the present would be a good time to make a thorough study of the field, especially in view of the high value of the dollar when converted into milreis, the high protective tariff, and the lower investment required in shipping raw materials to Brazil for fabrication as compared with shipping finished products."

Leo H. Marks, who was president of the defunct Marks Steel Supply Co., Cleveland, and who pleaded guilty to concealing assets totaling $3,500 during a hearing in bankruptcy proceedings, was sentenced last week by Federal Court to eighteen months' imprisonment in the Atlanta penitentiary.

The Iron Age and Its Readers

An interesting story may be told of the colorful advertisement which appeared on the front cover of the issue of July 13. It is a reproduction of a large painting now to be seen as one enters the offices of the American Rolling Mill Co., at Middletown, Ohio. A desire to have something monumental at the Armco Works to be symbolic of the company's niche in industry resulted in the decision to have a painting of permanence. In securing a representatively virile example of a worker for the picture, some twelve different employees were photographed in the attitude of the heroic figure, and a composite was made of the dozen subjects. When the picture was unveiled under impressive ceremonies, the audience of employees, in response to a request, named correctly eight of the men whose portraits had been used, thus making it possible to say that the worker as well as the works are preserved in the finished picture.

The advertisement itself is noteworthy as the first one on an IRON AGE cover requiring the so-called four-color process. Actually there were five colors, counting the black ink, for the red regularly forming the field of THE IRON AGE heading was not suited to securing a reproduction of the colors of the artist's painting, and another red was needed. Readers may perhaps take the excellence of subject matter and the general rendition of the advertisement as a compliment paid by the advertiser to their discerning appreciation.

Strike Causes Banking of Blast Furnaces

Four Stacks Now Idle in the Valleys and Others Have Difficulty in Operating—Situation in Many Centers More Serious

YOUNGSTOWN, July 18.—The question of fuel supply has become the dominant consideration in the iron and steel industry, overshadowing all other current influences. Attention of executives, operating officials and consumers is focused upon this issue and day-to-day developments. Important independents are laying plans for curtailed production, preferring to gradually let down than to consume reserves and then wholly suspend. Allocation of steel supplies to consumers on a pro rata basis looms as an early development.

Four blast furnaces have already been banked in the Mahoning Valley because of the disorganized transportation situation checking coal shipments. Tod furnace of the Brier Hill Steel Co. was banked July 17; the 600-ton stack at Warren, operated by the Trumbull-Cliffs Furnace Co., and supplying hot metal to the Trumbull Steel Co., went down July 16, while two stacks in the Haselton group of the Republic Iron & Steel Co. were banked July 15.

The situation is likewise forcing other curtailments, which promise to become more serious, unless fuel supplies improve.

Slowing Down Expected

The Youngstown Sheet & Tube Co. started the week with schedules at 80 to 85 per cent. Officials anticipate a slowing down before the week end, however, and characterize the fuel situation as desperate.

Paradoxically, the very seriousness of the situation presents the hope that an early adjustment will be effected. Shopmen's strike proved the last straw in the difficulties under which Southern roads, tapping mining regions in West Virginia and Kentucky, were laboring. Before the shopmen walked out, these carriers, connecting with trunk line roads serving the Valleys and other large consuming districts, were operating in excess of capacity to meet the enlarged demands for coal. This created additional strains on motive equipment and rolling stock and the crippled roads were unable to meet the crisis precipitated by the shopmen's walkout.

The first important independent in this territory to announce suspensions as a result of these developments was the Republic Iron & Steel Co., which on July 15 banked two of the three active blast furnaces in its Haselton group at Youngstown and its Bessemer department. Its Bessemer converters had been blowing only since July 5, when they resumed following a protracted shutdown.

Coal Shipments Short

Other Valley plants announced curtailments. These interruptions come at a time when the industry was hitting its stride and production of steel was approaching a rate close to normal. They are caused immediately through inability to obtain adequate coal shipments through the rail congestion. Stoppage of fuel supplies occurred almost overnight, and its immediate reflection in lowered schedules indicates dependence of the industry upon transportation.

Reserves at Valley Plants

Reserves at Valley plants will be conserved as long as possible to prolong at least partial operations. Reduced ingot output, forced by the situation, will curtail sheet bar supplies and thus cut into rolling schedules of both integrated and non-integrated sheet interests.

The Trumbull Steel Co., Warren, has a stock of cold iron sufficient to carry it along for about 60 days, irrespective of the operation of the blast furnace of the Trumbull-Cliffs Furnace Co., which has been supplying hot metal since Jan. 16 to the open hearth furnaces of the Trumbull company. The company expects to be able to secure enough coal and other fuel to continue operation of its steel plant and finishing departments.

Coal prices have stiffened at Southern mines as indicated by the statement of a large industrial buyer that he was offered coking coal at $5.50, at the mine, this price representing a horizontal advance of $2 per ton over previous quotations.

Proceeding With Caution

Naturally, in view of disorganized conditions, due to the coal and railroad strikes, sales departments are proceeding with caution in accepting future commitments. All business is of course contingent upon early adjustment of transportation difficulties.

Non-integrated sheet producers in the Valley protected on coal, will be compelled to slow down because of reduced volume of sheet bar shipments and will likely be forced into early suspension, unless the situation with makers of semi-finished stock improves.

Interference with outbound shipments of steel has been of minor proportions, especially on the New York Central, Erie and Pennsylvania lines. Ore movement from docks to Valley furnaces has slowed down, but not at all to the extent that coal shipments have been affected.

Comment of industrial executives is that, even if an early settlement is effected ending the shopmen's strike, it will be some time before the steel plants again reach their recent high operating rate, should broad suspensions occur. It is pointed out that it will take some time to restore the Southern railroads especially to a normal operating basis. A shortage of open top cars is predicted and return of coal rationing and lake coal priority under Government control is held probable by some interests.

Railroads Respond to Appeals in Making Rates

WASHINGTON, July 18.—Concern shown by iron and steel and other industries over the drain being made on their supplies of coal has caused railroads serving them to respond to appeals for fixing of commodity rates where it is necessary to make circuitous hauls because of strike conditions. In order to do this, railroads have been and are getting permission from the Interstate Commerce Commission to establish rates on coal on one day's notice. A number of lines serving important coal regions have found their usual gateways either closed or congested, resulting in the shutting off of the natural and most direct routes for coal shipments to steel and other industries, particularly those in Pennsylvania.

This has made it necessary to ship coal by indirect routes which would call for classification rating, usually sixth class rates, unless authority to establish com-

modity rates were granted. The railroads desiring to serve industries on their lines have been quick to act upon the suggestion of shippers, where the carriers themselves have not taken the initiative to establish the lower rates because of the exorbitant costs that would accrue to shippers on the payment of class rates on coal shipments. As it is, many steel companies are drawing coal from distant sources of production, which are resulting in high delivered charges and further narrowing of margins of profit. The overhead costs of steel companies, it has been pointed out, have greatly increased because of restricted production, brought about by the necessity to conserve supplies of coal. Shipments being received are not adequate to meet requirements and this is making it necessary to draw on stocks, the quantity of which is not known here.

Reduced Coal Output

The congestion of traffic conditions is referred to by the Geological Survey as a new cause for limiting the production of coal. It is not believed that the production of bituminous coal during the fifteenth week (July 10-15) can exceed 4,300,000 tons. Final reports on the week of Independence Day, the fourteenth week of the strike, show that 3,936,000 net tons of soft coal and 23,000 tons of anthracite were produced. Loadings on Monday, July 10, amounting to only 14,952 cars, were lower than those on Monday in other recent weeks and on Thursday they fell to 11,584, the lowest on any Thursday since mid-April. Districts affected particularly by traffic congestion, were Logan and eastern Kentucky, but in western Kentucky and southwestern Virginia, also, loadings soon began to decrease and by Wednesday even the Pocahontas Tug River and Kenova-Thacker were producing far below normal. In the non-union fields of Pennsylvania and in Alabama and the far West no decrease had been reported up to Wednesday.

Production of By-Product Coke

To replace the deficit in beehive coke caused by the strike in the Connellsville region and other beehive coke districts, the by-product ovens are now producing at a rate above even the average for 1920. The total output of by-product coke in June was in round numbers 2,580,000 net tons, against a monthly average of 2,565,000 tons in 1920, the record year. The average output per working day was 86,000 net tons, an increase of 5 per cent over the May average. The month's production represented 70 per cent of the aggregate capacity of the ovens. Of the 71 plants in existence, 58 were active and 13 idle.

These statistics are based on reports from 70 plants and include an estimate for the one plant not heard from.

Because of the low production of beehive coke—458,000 tons against a monthly average of 1,748,000 tons in 1920—the total output of all coke was only 3,038,000 tons. This was 70.5 per cent of the monthly average of all coke in 1920.

To make the coke produced, it is estimated, required 4,429,000 tons of coal, of which 3,707,000 tons was used in by-product ovens and 722,000 tons in beehive ovens. The present monthly rate of consumption of coking coal is thus about 1,300,000 tons above the 1921 average, but is still 2,660,000 tons below the average in the year of maximum demand, 1918.

Drop in Coal Production

Uniontown, Pa., July 15.—The railroad strike will result in a drop in production during the week just closing at coal and coke plants in the Connellsville bituminous region, although figures are not available. The strike of shopmen has affected railroads in the region, particularly the Baltimore & Ohio, which has suffered considerably in movement of both passenger and freight trains. The Pennsylvania was not seriously crippled when West Brownsville and Youngwood crews went out, but late this week Rainey yard shopmen quit. The delays on the Baltimore & Ohio have crippled shipments of coal and coke somewhat.

No improvement has been noted in the coal strike situation as pertains to the disorder phase. Three men were killed early this week at New Geneva, being shot by LeRoy Lincoln, a guard. The shooting followed trouble at the Atlantic Coal & Coke Co. The victims were striking miners, and large crowds attended their funerals, State police being on hand following a tip that a demonstration was planned. There was no disorder, however. The guard is being held in the county jail pending investigation.

The first big picnic of the striking miners of the region was held at Shady Grove park last Saturday afternoon. There were a number of addresses. The men were told that, if the union men in other fields returned to work following any agreement reached at Washington, they would contribute half their pay to the men in the Connellsville region. Previously the strikers in the local region have been told that the union men would accept no agreement which did not provide for the men in the Connellsville region.

There is growing dissatisfaction in the region although just what form such feeling will take remains problematical. There are increasing tent colonies in the region as strikers and sympathizers who refuse to return to their work are being evicted from company houses.

The number of evictions is being increased daily. Companies in the region are preparing to continue operations. A number of ovens have been put in blast in the Fairchance region. In this territory, the H. C. Frick Coke Co. is continuing its advertisement of $500 reward for information leading to arrest and conviction of those responsible for dynamite outrages.

As the strike progresses with the striking miners refusing to go back to work and their places being taken by outside men, the situation is becoming increasingly serious. It is true that there is a heavy shifting about of men in the region, workers going to other plants and returning to work while refusing to go back to work at plants where they have resided for years.

Vigorous Protest Against Illinois Atrocities

Illinois coal operators representing all sections of the state, at a large meeting held at the Great Northern Hotel, Chicago, today, expressed unanimously their "continuing horror and bitterness of feeling over the monstrous atrocities committed near Herrin, Ill., on June 20 and 21, when some 72 employees of the Southern Illinois Coal Co., after their surrender under a flag of truce, were removed from the mining property and a substantial number of them brutally murdered by a lawless mob on the public highways, the remainder being tracked like wild animals through woods and fields in an effort to destroy them all.

That local and State officials, with a full knowledge of the extreme threat of this situation, and in ample time to have prevented such ruthless butchery, took no action to prevent it, is and will remain a stain not only upon the local community but upon the State as a whole until through adequate energy and effort not only the perpetrators but the instigators of this awful crime are apprehended and punished to the fullest extent of the law.

If for any reason, either of politics or because of the domination by any class or group, there shall be failure on the part of the proper authorities to handle this situation promptly and vigorously, it must be apparent to everyone that group lawlessness will be encouraged and become a menace always before the people in every section of the State.

We commend the utterances of President Harding in his address on July Fourth, that "liberty is gone in America when any man is denied by anybody the right to work and live by that work. It does not matter who denies. A free American has the right to labor without any other's leave."

The production of Portland cement for the first half of 1922 is estimated by the United States Geological Survey on the basis of returns from producers at 31,664,000 bbl. against 27,228,000 in 1921. Shipments for the six months of 1922 are 34,811,000 bbl. and for 1921, 27,984,000 bbl.

GETTING READY TO BUY

Knowledge of Requirements an Important Element—Flexibility Essential

BY JOHN J. RALPH

WHAT is the kind of proposition the sales department respects, goes right after, checks through carefully to see if the bid can be bettered, either in price or in value? The kind it likes to land and is chagrined when lost? In the first place, it is clear cut; in the second, it is complete.

When looking at the specification the seller knows the buyer knows what he wants. He knows what the market affords, for there is margin enough to care for standard variation of material. He knows the quantities he should buy, considering both the plant needs and price conditions. Delivery terms, quality and inspection conditions insure a fair deal. There is a lack of the "cast iron" quality that invites the best efforts to give the best products at the best price.

It is obvious that getting up such a bid is not the duty merely of a purchasing agent or department. It goes back through the entire organization. The files and records of the purchasing department first yield descriptions of the available products and trade information concerning them and names of possible suppliers.

These are considered by the design and manufacturing departments and the relative adaptability is worked out. The sales department also has a hand in it, with a view to the salability of the finished product. The cost department goes over its records, to show the variation in manufacturing cost due to variation in quality.

There are then worked out specifications of the ideal material or machine. There is also worked out an estimate showing at what price it would pay to make the purchase and the effect which lowering the price would have on the quantity that could be bought to advantage at one time.

There will be considered the effect on manufacturing cost of variations of chemical and physical nature from the ideal. Competing materials will be considered and relative prices which would make an equivalent buy roughly computed.

With this information as a basis, the purchasing agent is then ready to go into the market for supplies or machinery. He is able to draw his specifications to permit submission of bids, both of the ideal material as determined by the factory and substitute materials, and obtain intelligent bids from those approached. He has clearly stated the allowable variation in quality, in finish, in size.

Bidders Help Solve the Problem

By stating the use, he obtains the assistance of bidders who may have materials or methods available for satisfaction of the need, which the plant information files did not supply, and it may lead to finding a material or machine more satisfactory than the stated shop ideal. The clear statement of the possible quantities the plant may buy may enable one or more competitors, by working out better methods of production, to give a better price without changing the quality.

Bids having been received, it is sometimes possible to decide immediately just what is the best purchase to make.

If the bids give alternatives, they require careful attention by design, manufacturing, cost and sales departments. The investigation will be similar to the preliminary one, but this time will proceed on definite actual figures rather than on estimates. The maximum price that could be paid for the product to make it a money-making purchase having been decided, the relative profits to be made through the use of alternatives can readily be worked out. The bids and the trend of prices will determine the quantity it will pay to buy.

Conferences and Investigations

Every department in the plant is interested in the main purchases. The opinion of each department has a modifying effect on that of every other department. The purchasing agent requires all of this information. When the problem is put up to him in final shape, it should be in just exactly as clear and complete a form as his request for bids or the bids themselves.

It is usual to go over matters in conference taking up the various aspects, but it is not usual to reduce the discussion to writing or to get written reports covering the salient questions as they appear to the various departments. Such reports are essential to the best work by the purchasing agent, for from them he can prepare intelligently his request for bids.

It is possible to carry this, as all other careful work, to a ridiculous limit, but where the fundamental product, manufacturing and design conditions of the plant depend on the purchase, it is impossible to exercise too much care. Reducing the informal discussion to a formal report also has the advantage of impressing on the various departments the fundamental importance of buying, and their part in it.

If this is reduced to a routine there is a tendency, after the initial installation, for it to become machine-like. If so, it is far better to return to the system of individual "hunches," for reliance placed on a precise looking report, which is in reality inaccurate, makes it easy for big mistakes in judgment to occur.

Degree of Investigation Warranted

Be the purchase small or large, it has its proportionate effect on the profit sheet, and the elements of the large purchase are the same as the elements of the small one. Training in consideration of the elementary economics of the small purchase, usually prepared and handled by the less important members of the organization, is precisely the development of methods of investigation which they will use later in considering more important purchases.

Small purchases fall in classes and their aggregate runs up to a considerable sum in each class. Each class of purchases needs consideration and decisions should be made as to the relative economy to be reached, and the conditions, for each type of purchase.

The effect on the profit sheet of some of these small purchases is often entirely out of proportion to their money value. Just the substitution of one make and type of tool for another may increase the efficiency of some workman more than enough to pay for the tool in one day.

Here we have, then, the measure of the amount of attention to be paid to any purchase—the resultant economy attainable through more careful consideration. Where the amounts run large, as in the case of raw materials; where the time influence of the purchase is considerable, as in the case of tools and equipment, much attention should be given.

Limiting Conditions Often Harmful

It is usual for the purchasing department to be bound by a rule that no purchase shall be made of over a certain sum without the approval of the board of directors.

Right here is the source of much foregone profits. Ask your own salesmen about this, and the times when a shop has been balked of purchasing because of the prejudices of some member of the board, or because of an arbitrary ruling that no more money was to be spent in some direction for a set length of time.

Try to sell a labor-saving tool to some railroad shop or to an institution with a number of plants and a governing central board. Yes, and many a time clever selling to the same source, against the entire sentiment and advice of the shop, has fastened on the manufacturing department costs, with no possibility of profit, that have later proved very embarrassing.

The army philosophy is that the bestowal of rank is the automatic bestowal of ability to fill the position. We can see the absurdity of this in the army, but in industrial ranks is it certain that there is not much of the same feeling?

The urgent necessity for improving buying and for reaching the highest state of that art is beginning to be understood. The basic realization is that, while principles never change, circumstances do, and that under

different circumstances the application of the same principles must always produce different results.

Each problem must be carefully studied and a solution reached in keeping with the facts. The intrusion of personality or personalities almost always means an imperfect solution. The man who requires purchases made to suit his prejudices is too small to be able to grasp the essentials of real purchasing and if his influence is sufficient it sooner or later spells grave loss to the plant.

People Expected to Support the President

White House Calls Upon Executives of 28 States to Do Their Duty—Governor Sproul of Pennsylvania Is First to Respond

WASHINGTON, July 18.—Public approval is expected to be given readily to the drastic step of President Harding to bring about immediate resumption of coal production. The communication addressed to 28 Governors of coal producing States this evening at 6 o'clock in substance provides that they shall make every effort, with the assurance of support from the Federal Government if needed, to see that coal mining operations are started at once. While the communication does not specifically say so, it is plain in making it known that troops or any other means that may be required shall be used to protect mining properties and transportation. The final sentence in the statement of the President is a challenge to strikers or any others who attempt to interfere with coal mining and transportation. "To the task of lawful protection and the maintenance of order the Federal Government pledges every assistance at its command," concludes the communication.

Attitude of Labor Unions

In a word, if the States find it necessary to call upon the Federal Government for troops or other means for protection, they will be afforded. Organized labor already has begun a campaign of what appears to be open defiance of the Government. This had been expected and is being disregarded. But the attitude of the Government similarly is directed against coal operators who also refused to accept plans of arbitration.

Operators Also Blamed

It is distinctly known that Government officials consider that the tactics of delay, evasion and final refusal to submit to the Government's proposals of negotiation and arbitration, except upon their own terms, by operators, were as reprehensible as those of the miners' union. The outcome of the strife between the Federal and State Governments on the one hand and the organized miners on the other is being watched with eagerness, but the utmost confidence is expressed that, whether the strikers capitulate or not, they have lost their opportunity to resume work on an equitable basis, which by some is considered to be more than equitable for them.

All Other Means Exhausted

The Administration did not take its present steps until after it had exhausted every means of peaceful settlement of the strike, but finding they were futile, it has resorted to the only alternative it thinks remained. It has turned to the State governments to remind them that it is for them to assume responsibility in the situation which, it is believed, has been decidedly lacking in many instances. Pledge of the aid of the State of Pennsylvania made by Governor Sproul was the first publicly announced policy of any State and it is expected that the other States will fall in line. Those that do not, it is stated, will have to submit to Federal action.

In his statement, the President points out repeated efforts of the Federal Government to settle the coal strike and says that their failure left him "no other course but to invite the mine operators to return to their mines and resume activities." A number of operators have said that with sufficient protection they will have no difficulty in getting miners and resuming production. It is also intended to see that transportation is protected, made more difficult because of the rail strike, but it is believed the protection necessary will be easily provided. The President told the Governors that he hopes they will find it consistent to second the invitation to have all miners and operators resume their work, and points out the joint responsibility of the State and Federal Governments.

Responsibility Placed

"We are responsible," says the statement, "for the production and the transportation of a fuel supply ample for the necessities of the American people and the public utilities which serve them, particularly the railways engaged in interstate commerce. We must have ample coal to maintain industrial activity, we must have the coal necessary to the health, security and activity of all the people."

In concluding, the statement says:

"It becomes necessary, therefore, in the name of common welfare, to invite production, in the fulfillment of that obligation which attaches to any American industry engaged in providing any public necessity, and to afford security to all men alike who are ready and willing to work and serve the common need. No cause is so important as that of common welfare and there must be the suppression of every unlawful hindrance to the service of that cause. To the task of lawful protection and the maintenance of order the Federal Government pledges to you every assistance at its command."

Disagreement Does Not Justify Increase of Freight Rates

WASHINGTON, July 18.—Notice has been served upon the railroads by the Interstate Commerce Commission that disagreement over divisions is not considered justification for increases in or cancellation of joint through rates. Calling attention to the fact that it frequently occurs that carriers, unable to agree among themselves upon the division of such rates, propose to cancel or increase the rates, the commission points out to the railroads that under Section 15 of the Interstate Commerce act it has no option other than to condemn such changes unless substantial justification other than dissatisfaction with the divisions is submitted. Almost invariably, it is declared, when there is a lack of justification, the commission suspends such cancellation or increase and after hearing, requires that the schedules under suspension be canceled, continuing the joint rates in effect.

Iron and Steel Markets

MORE PLANTS SHUT DOWN

Fuel Scarcity and Railroad Troubles More Pronounced

Pennsylvania Coal Mines May Start—Fuel Oil Being Used at Steel Works

The effect of the coal and railroad strikes in cutting down pig iron and steel production is more pronounced. At Youngstown, Ohio, three large blast furnaces have banked and the Bessemer steel department of the Republic Iron & Steel Co. has closed down. A steel company blast furnace at Warren, Ohio, has stopped, also one at Steubenville, Ohio. At Cleveland the McKinney Steel Co. has banked a blast furnace and at two Cleveland steel plants five open-hearth furnaces are down. Cherry Valley furnace at Leetonia, Ohio, will probably go out this week. In eastern Pennsylvania two Bethlehem blast furnaces have been compelled to bank.

In the Pittsburgh district, all furnaces and steel works active last week have kept going, but steel works and rolling mills have been hampered by delays in coal delivery and some mills have fallen further behind on orders. Railroad congestion and labor shortage in several shops around Pittsburgh have hindered shipments in and out. In other Pennsylvania districts congestion of freight cars at junction points is causing trouble. West Virginia and Kentucky coal roads have been further crippled.

The iron ore movement on the Mesabi range in Minnesota has been reduced 25 per cent and some underground mines have stopped loading ore. While the operating percentage of the steel industry as a whole has not been seriously cut down by the week's events, the strain upon producers is much increased. One large Pennsylvania steel company, in view of the greater difficulty of getting coal, has withdrawn from the market as a seller of finished steel.

Consumers are more concerned about the delivery of steel they have bought, and in many cases their representatives are going to Pittsburgh mills to hasten shipments. New business is falling off, because of increasing uncertainty as to costs and fuel supplies, and on some products higher prices are being asked, particularly bars and plates. Some independent sheet mills have withdrawn all prices and a higher sheet market is predicted.

With coal growing scarcer, some steel plants are substituting fuel oil, though at rising prices. Large oil shipments are going to Youngstown, Ohio, this week, and a central Pennsylvania plate mill has started to use oil in its open-hearth furnaces.

Western Pennsylvania coal mines owned by steel companies or from which steel companies commonly buy coal may see the first efforts to operate in response to the President's proclamation. But railroad conditions must improve before increased coal production can be felt to any great degree, and the outlook at best is for hampered transportation for weeks to come.

Farming out of car and locomotive repairs features the railroad equipment market, but orders for 2300 new cars and 75 new engines were placed. Repair orders of the week cover 7600 cars and 220 locomotives, not counting heavy material purchases by the Pennsylvania Railroad, for use in its own shops, or the numerous small repair jobs negotiated with difficulty.

At Chicago the seasonal falling off in orders from the automobile industry has not yet developed. It now appears likely that there will be little or no gap between the demand for bars from that source and the starting of buying by agricultural implement makers. The latter are expected to be active within 30 days.

The inability of Western steel bar mills to take early delivery business has caused a demand for iron bars, and the latter are up $2 per ton.

Workers in Central Western sheet mills governed by the sliding-scale agreement will receive for July and August a 3 per cent advance over the base rate, shipments in May and June having averaged $2 per ton higher than in the previous 60 days. A further advance is already indicated for the next settlement.

In addition to the furnaces which have retired from the pig iron market, having banked because of coke shortage, a number have virtually retired by asking prices far above recent quotations.

Three weeks of July in fabricated steel lettings appears to show 30 per cent falling off from the tonnage awarded for the corresponding period of June. For the entire month of June bridge and building contracts took 66 per cent of shop capacity, according to figures compiled by the Bureau of the Census, while in May 81 per cent of capacity was engaged.

Pittsburgh

Fuel Shortage Causes Sharp Reduction in Plant Operations

PITTSBURGH, July 18.—Coal and coke shortage, due to the strikes of miners and railroad shopmen, is now seriously affecting operations of blast furnaces, steel works and general manufacturing plants in the Pittsburgh, Youngstown and Wheeling districts. In Youngstown, the Republic Iron & Steel Co. has been compelled to bank two of its three blast furnaces at Haselton and has closed its Bessemer steel plant at Youngstown. The company is still operating 12 out of its 14 open-hearth furnaces and its skelp and pipe mills are going, but at a reduced rate, and possibly may have to close in part at least within a week unless the supply of coal increases. In the Wheeling district, the Wheeling Steel Corporation banked one La Belle furnace at Steubenville on July 13, and both of its stacks there are idle. The comany is operating its top mill and Portsmouth furnaces but has two stacks down in Wheeling and the Martins Ferry stack is out. So far this company has not been compelled to close down any of its steel mills or finishing departments. In the Pittsburgh district, the Carnegie Steel Co. blew out one Isabella furnace on July 8 for relining, but this was necessary, and was not done on account of the coal strike. The company is now operating 38 out of 59 stacks. The Jones & Laughlin Steel Co. is fortunate in having a fair supply of coal, and has not been compelled to close down any of its blast furnaces, steel works or finishing mills either in Pittsburgh or Aliquippa.

While so far in this coal and railroad critical situa-

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	July 18, 1922	July 11, 1922	June 20, 1922	July 19, 1921
No. 2X, Philadelphia‡	$27.64	$27.64	$27.32	$21.85
No. 2, Valley furnace†	24.00	24.00	24.00	19.50
No. 2, Southern, Cin'ti†	21.53	21.53	23.00	24.50
No. 2, Birmingham, Ala.†	18.00	18.00	18.50	20.00
No. 2 foundry, Chicago*	24.00	24.00	23.50	18.50
Basic, del'd, eastern Pa.	25.75	25.75	25.00	21.25
Basic, Valley furnace	24.00	24.00	25.00	19.00
Bessemer, Valley, del. P'gh	26.77	26.77	26.96	22.46
Malleable, Chicago*	24.00	24.00	23.50	18.50
Malleable, Valley	24.50	24.50	24.50	20.50
Gray forge, Pittsburgh	25.27	25.27	25.46	21.46
L. S. charcoal, Chicago	31.65	31.65	29.00	36.00
Ferromanganese, seaboard	67.50	67.50	67.50	70.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$40.00	$40.00	$40.00	$47.00
Bess. billets, Pittsburgh	35.00	35.00	35.00	33.00
O.-h. billets, Pittsburgh	35.00	35.00	35.00	33.00
O.-h. sheet bars, P'gh	35.00	35.00	35.00	35.00
Forging billets, base, P'gh	40.00	40.00	40.00	38.00
O.-h. billets, Phila.	40.17	40.17	40.74	38.74
Wire rods, Pittsburgh	40.00	40.00	38.00	42.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, Pgh, lb.	1.70	1.70	1.70	2.00
Light rails at mill	1.75	1.75	1.50	2.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	1.925	1.925	1.96	2.10
Iron bars, Chicago	**1.90**	1.80	1.75	1.90
Steel bars, Pittsburgh	1.70	1.70	1.70	1.80
Steel bars, Chicago	1.75	1.75	1.75	2.18
Steel bars, New York	2.04	2.04	1.98	2.18
Tank plates, Pittsburgh	1.70	1.70	1.60	1.80
Tank plates, Chicago	1.75	1.75	1.75	2.18
Tank plates, New York	2.04	2.04	1.98	2.18
Beams, Pittsburgh	1.70	1.70	1.60	1.85
Beams, Chicago	1.75	1.75	1.75	2.23
Beams, New York	2.04	2.04	1.98	2.23
Steel hoops, Pittsburgh	2.50	2.50	2.40	2.50

Sheets, Nails and Wire,	July 18, 1922	July 11, 1922	June 20, 1922	July 19, 1921
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	3.15	3.15	3.15	3.25
Sheets, galv., No. 28, P'gh	4.15	4.15	4.15	4.25
Sheets, blue an'l'd, 9 & 10	2.40	2.40	2.40	2.50
Wire nails, Pittsburgh	2.40	2.40	2.40	2.75
Plain wire, Pittsburgh	2.25	2.25	2.25	2.50
Barbed wire, galv., P'gh	3.05	3.05	3.05	3.40
Tin plate, 100-lb. box, P'gh	$4.75	$4.75	$4.75	$5.75
Old Material, Per Gross Ton:				
Carwheels, Chicago	$19.50	$19.50	$18.25	$12.50
Carwheels, Philadelphia	17.50	17.50	17.00	16.00
Heavy steel scrap, P'gh	17.25	17.50	17.00	12.00
Heavy steel scrap, Phila.	15.00	15.00	15.00	11.00
Heavy steel scrap, Ch'go	15.50	15.50	14.50	10.00
No. 1 cast, Pittsburgh	19.00	19.00	18.50	16.00
No. 1 cast, Philadelphia	17.50	17.50	19.00	17.00
No. 1 cast, Ch'go (net ton)	17.00	17.00	15.75	12.50
No. 1 RR. wrot, Phila.	17.00	17.00	17.00	13.50
No. 1 RR. wrot, Ch'go (net)	13.50	13.50	12.50	9.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$11.00	$9.50	$6.50	$2.75
Foundry coke, prompt	11.00	10.00	7.00	4.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	14.00	14.00	13.75	12.75
Electrolytic copper, N. Y.	13.75	13.75	13.50	12.62½
Zinc, St. Louis	**5.75**	5.52½	5.37½	4.25
Zinc, New York	**6.10**	5.87½	5.72½	4.75
Lead, St. Louis	5.50	5.50	5.60	4.35
Lead, New York	5.75	5.75	5.85	4.40
Tin (Straits), New York	**31.50**	31.12½	31.37½	27.00
Antimony (Asiatic), N. Y.	5.00	5.00	5.10	4.65

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.
The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price, July 18, 1922, Finished Steel, 2.169c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel

July 11, 1922,	2.169c.
June 20, 1922,	2.141c.
July 19, 1921,	2.407c.
10-year pre-war average,	1.689c.

Composite Price, July 18, 1922, Pig Iron, $23.61 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

July 11, 1922,	$23.61
June 20, 1922,	24.05
July 19, 1921,	19.81
10-year pre-war average,	15.72

tion there has been no suspension of blast furnaces and steel works in the Pittsburgh district, they are very much hampered in operations by the scarcity and delay in delivery of coal to the plants by the railroads, which have been intensified by the railroad strike. This has brought about a restriction in output, and the steel works and finishing mills are steadily getting further behind in deliveries. Consumers are getting very anxious about deliveries of materials they have bought, and are hounding the mills for shipments. Some representative consumers have men in this district at the different plants from which they have bought material, who are using every effort they can to expedite shipments.

The Baltimore & Ohio Railroad seems to have been hit harder by the strike than any other of the trunk lines entering this district. This road has already cancelled excursion trains and several of its through trains, especially those running into West Virginia and other southern territories. The Pittsburgh & Lake Erie has been seriously affected by the walkout of shopmen at its McKees Rocks shops which at noon on Monday virtually suspended operations. The McKees Rocks shopmen are members of the American Federation of Railroad Workers, an independent labor organization that did not join the strike when it was called on July 1. They now claim that the Pittsburgh & Lake Erie Railroad was sending Baltimore & Ohio trains over its tracks, and they refused to permit this to continue, and went out on strike. The Pennsylvania Railroad claims that many of its men are returning to work. This railroad has brought in some strike breakers, some of whom quit when they realized the situation. The Erie Railroad has applied to the deputy United States marshal to protect the men in the shopmen's strike, this protection being asked in Erie, Crawford and Venango counties. The Erie Railroad has been crippled by the shopmen's strike at its shops at Meadville, Pa., which are doing little work.

Steel companies are scanning orders closely, turning down promptly any business coming from other than regular customers, and in many cases paring down considerably orders that their regular customers are trying to place. Prices show a decided upward tendency and sales of steel bars at 1.80c. are being made regularly, while it is claimed that plates have been sold as high as 1.90c. at mill. The situation now in finished steel products is that it is not so much a question of prices, but whether the mill can make the delivery wanted.

Pig Iron.—The local market is quiet, and with some furnaces already out, and a strong possibility that others may have to go out, on account of not being able to get shipments of fuel, the market is expected to take an upward turn in prices, but has not yet done so. A local open-hearth steel concern sent out an inquiry two or three days ago for 5000 tons of basic, and is reported to have already closed for the iron with a Valley furnace at $24 at furnace. There is no demand for Bessemer or malleable, and sales of foundry have dwindled down to carloads and lots up to 200 tons. One interest reports a sale of 250 tons of No. 2 foundry at $24 at Valley furnace. One maker of basic is selling at $24 Valley furnace. Another maker of basic is holding for $25, Cleveland, freight added for delivery to any point, but has not sold any iron as yet at this price. Unless the coal and railroad strikes are quickly settled, a number of steel works and merchant blast furnaces will have to go out or bank, as supplies of coke and other fuels are steadily getting scarcer, the railroads being unable to move them. Two stacks in the Shenango Valley and two or three in the Mahoning Valley are on the ragged edge for coke and may possibly have to bank this week.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.77 per gross ton:

Basic	$24.00
Bessemer	25.00
Gray forge	$23.50 to 24.00
No. 2 foundry	24.00
No. 3 foundry	23.50 to 24.00
Malleable	24.50

Ferroalloys.—The local market is not active, as consumers of ferromanganese have apparently covered their needs for some months and are out of the market. A few sellers are quoting prompt ferromanganese at $70, Atlantic seaboard, for either British or domestic, and several small sales have been made at that price.

We quote 78 to 82 per cent ferromanganese, $67.50 c.i.f. Atlantic seaboard for domestic; British, spot, $70; British, future, $67.50; German, 76 to 80 per cent, $66. Average 20 per cent spiegeleisen, $36 furnace; 16 to 19 per cent, $35 furnace; 50 per cent ferrosilicon, domestic, $55 to $60 furnace, freight allowed. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, $41.50; 11 per cent, $44.80; 12 per cent, $48.10; 13 per cent, $52.10; 14 per cent, $55.10; silvery iron, 6 per cent, $30; 7 per cent, $31; 8 per cent $32.50; 9 per cent, $34.50; 10 per cent, $36.50; 11 per cent, $39; 12 per cent, $40.50. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $4.06 per gross ton.

Iron and Steel Bars.—There is no let-up in the demand for steel bars, which is very heavy, and mills are considerably back in shipments. The Carnegie Steel Co. is reported filled up for two or three months and is accepting orders only for indefinite delivery at 1.60c. at mill, for favored customers. Independent mills are quoting steel bars from 1.70c. to 1.80c., but are scanning orders closely, not desiring to take on any orders they can avoid, and at the same time serve regular customers. The demand for iron bars is fairly active, with prospects of higher prices very soon, owing to higher labor costs.

We quote steel bars rolled from billets at 1.70c. to 1.80c.; reinforcing bars, rolled from billets, 1.70c. to 1.80c. base; reinforcing bars, rolled from old rails, 1.60c.; refined iron bars, 2.20c. in carloads, f.o.b. mill, Pittsburgh.

Structural Shapes.—No large structural jobs have been placed here lately, and inquiry is light. The two local mills that roll shapes are filled up over the next two or three months, and are declining to quote, except to favored customers, and then only for indefinite delivery. Prices quoted on current order range from 1.60c. to 1.80c., depending entirely on the customer, the size of the order and the delivery.

Steel Rails.—Two local companies that roll light rails state that demand in the past week has been more active, and report closing contracts for 5000 tons or more of 25 to 45 lb. sections at 1.75c., base at mill. With the serious condition existing, owing to the railroad strike, it is likely some railroads will ask the mills to defer shipments until the situation has cleared up. Two trunk lines entering this city have already suspended shipment on all track materials.

We quote 25 to 45-lb. sections, rolled from new steel, 1.75c. base; rolled from old rails, 1.60c. to 1.65c. base; standard rails, $40 per gross ton mill for Bessemer and open-hearth sections.

Wire Rods.—The demand for wire rods is reported as fairly active, but the available supply is limited. Due to the constantly decreasing supply of coal on account of the strike, makers of rods will not sell for delivery very far ahead. The American Steel & Wire Co. continues to quote soft common rods at $40 Pittsburgh, and another local maker having in view the probable higher cost of coal, is now quoting $43, Pittsburgh, but is not anxious to sell very many rods even at that price. Another leading maker here is declining to book orders for rods, desiring to conserve its supply for use in its wire and wire nail mills. An inquiry came in the market recently for 1200 to 1500 tons of soft rods, but it has not yet been closed. So far as known, almost no new orders have been taken as yet at above $40, at makers mills.

We quote No. 5 common basic or Bessemer rods to domestic consumers $40, chain rods $40; screw stock rods, $45; rivet and bolt rods and other rods of that character, $40; high carbon rods, $47 to $50, depending on carbon, per gross ton, f.o.b. Pittsburgh or Youngstown.

Wire Products.—Considering that this is usually the dull season of the year, the present heavy demand for wire and wire nails is remarkable, and is caused largely by the fact that jobbers and consumers are afraid of future supplies, due to the coal strike, also realizing that prices of wire nails are low, and they are anxious to stock up as largely as possible. The American Steel & Wire Co. is reported to be slow in delivery of wire nails, and has heavy obligations on its books. This condition allows a good deal of business to go to the independents that can make fairly prompt shipments, and they are taking orders freely. All the independent makers are now quoting wire nails at $2.40 base, having found it impracticable to get a higher price than was being quoted by the leading interest. Specifications against contracts are good, but the mills are slow to take on obligations, owing to their constantly dwindling supplies of coal. One large maker of wire nails reports it has a full supply of coal until Sept. 1, but unless the strike is settled before that date, it will have to close down its mills, in part at least. The demand for wire and wire fence is reported active, and for the latter has been enlarged by the recent reduction in prices of $5 per ton, which all makers met promptly. We now quote wire nails at $2.40 base and plain wire at $2.25 per 100-lb. at mill. Detailed prices on wire products and woven fence are given on page 183.

Cold-Finished Steel Bars and Shafting.—While some effort has been made to advance the market on cold-rolled bars to 2.25c, it has not developed very far, the leading maker here continuing to quote cold-finished steel bars at 2.10c, but it is stated one or two other makers are quoting 2.25c, so far without securing very much new business. The tendency of makers is not to sell very far ahead on account of the uncertainty as to the supply of coal, and the certainty of higher manufacturing costs if the coal strike should continue for some considerable time. Makers here are able, so far, to ship out promptly, except in the case of small rounds, in which there is some delay in delivery. Ground shafting is firm at 2.50c base, f.o.b. mill in small lots, 2.60c in less than carload lots. Demand is fairly active.

Cotton Ties.—Reports from several local makers of cotton ties are that the bulk of the business for the 1922 season is already on the books and that future sales will be confined to small lots and repeat orders from large users who may not have covered their full needs. No figures are available as to the tonnage in cotton ties for this year, and this will not be known until the full size of the cotton crop is determined. While some comment has been made that $1.10 per bundle of 45 lb. is a low price, there has been a shading of this price to $1.07 to very large users. We quote cotton ties at $1.10 per bundle of 45 lb. for July shipment, with a carrying charge of 1c per bundle for each month thereafter.

Rivets.—The demand for rivets from car builders is active, but from boiler shops it is only fair. Makers say that owing to higher prices for coal and for rods

and steel bars, they ought to be getting higher prices for rivets, but so far no move has been made with this in view. Makers are pretty well covered on rods at $38 or less, and on steel bars at 1.60c, but when they have to again enter the market for these materials, they will probably have to pay higher prices. The market is very firm and any change is likely to be to a higher market. Prices and discounts are given on page 183.

Plates.—Inquiries for plates in the past week have taken a spurt, and the leading interest has closed for 5000 tons for car repair work for the Pennsylvania Railroad, and expects to close in a few days for a much larger tonnage for 35 locomotives to be built by the Baldwin Locomotive Works for the Baltimore & Ohio Railroad. Inquiries for the plates and other materials for these locomotives were received here yesterday. The Carnegie Steel Co. is still quoting 1.60c. on plates for such deliveries as it can make, but has made some sales at 1.65c. to 1.70c., at mill. Independent mills are quoting plates all the way from 1.70c. to 1.90c., the price depending on the customer and the delivery wanted. A mill in the Wheeling district reports having sold sheared tank plates on the basis of 1.90c., Pittsburgh, for fairly prompt delivery. Prices are give on page 183.

Tin Plate.—This month and August are the peak months for the canning of fruit and vegetables, and makers of food containers are urging the mills for shipments of tin plate, one leading can maker having had a man here for some days. Operations among the tin plate mills have slowed down, the American Sheet & Tin Plate Co. operating this week to only about 70 per cent, the independent mills also showing a falling off, not only in operations but in output. Heavy stocks of tin plate are piled up in warehouses of the mills, which they are unable to move to customers, owing to the shortage of labor and the congested condition of the railroads. There is no change in prices, which are given on page 183.

Track Equipment.—The railroad strike is regarded as in a more serious condition today than at any time since it started, but in spite of this, two large inquiries from railroads for spikes have come into this market in the past week. The Southern Pacific has an inquiry out for 2500 kegs and the Erie for 5000 kegs. General demand for large spikes has been fairly active, but is likely to fall off as most railroads have covered their needs for this year, and also on account of the railroad strike. The demand for small spikes is active. Prices are firm and we continue to quote large spikes at $2.25 per 100 lb. and $2.50 for small and large and bolt spikes. A leading maker here continues to quote $2.35 for large spikes, but is quoting the above named prices on small spikes. There is a good demand for track bolts, the minimum price on which is $3 base, per 100 lb. on good orders. It is said the recent advance of $5 per ton on tie plates is holding firm, and we now quote these at $2 to $2.25 per 100 lb. maker's mill. Detailed prices are given on page 183.

Billets and Sheet Bars.—A week ago it was comparatively easy to obtain billets or sheet bars for fairly prompt shipment, but to-day the reverse is the case, and several mills that have been offering both billets and bars in the market now say they have none to sell, owing to the uncertainties of the situation as regards supplies of coal and coke. A local company reports a sale of 500 tons of sheet bars at $35, Pittsburgh, and 200 tons of small billets at the same price.

Iron and Steel Pipe.—The coal strike is embarrassing pipe mills more now than at any time since it started, and is restricting output to a considerable extent. This is naturally increasing costs somewhat, but as yet there are no indications of an advance in prices on either iron or steel pipe at an early date, this being regarded as an inopportune time to advance prices on account of the present serious labor troubles. The demand for butt and lap welded sizes of iron and steel pipe and also for line pipe is heavy, and the mills are inclined to go slow in taking on obligations on account of the uncertainty of future coal supplies. Several local makers report that on both butt and lap-welded sizes they are filled for three to four months, and are slipping back in deliveries owing to their output being curtailed. There is a better demand for oil country goods which are moving out freely. The order for six miles of 12-in. plain end line pipe for the Union Natural Gas Co. was placed with a local mill. Demand for butt welded sizes of pipe is probably the heaviest ever known, much of the tonnage going into building operations which are active all over the country. A further curtailment in production of pipe is looked for, unless there is soon a settlement of the coal strike. So far the railroad strike has not interfered seriously with shipments, except that some mills report shortages in cars on several days last week. Discounts are given on page 183.

Hot-rolled Strips.—Two local makers say their demand has been active in the past week or two, both consumers and jobbers desiring to stock up as largely as possible in view of restricted supplies in case the coal strike is prolonged. At the same time, it is a fact that the demand from consumers for strips to go into early use is active, and the tendency of the market is upward. A good part of the present demand comes from the automobile builders, who are putting the material into cars about as fast as they receive it. It is said that on the narrow light gages of hot-rolled strip steel, a modest advance over the base price is being paid in some cases. We quote hot-rolled strips at 2.50c base, Pittsburgh.

Steel Skelp.—Demand is reported active with available supply very light. One large user that was formerly a buyer in the open market is running its own skelp mill and making practically all it needs for its pipe mills. Prices are firm with a tendency to advance on account of the higher costs of coal and other manufacturing charges. We quote grooved and sheared skelp at 1.70c. to 1.80c. at mill, depending on the order.

Cold-rolled Strips.—Local makers report specifications against contracts in the past week have been more active, showing a desire on the part of users and jobbers to increase their stocks, in view of the uncertainty of ample future supplies. The market is firm at 4c, base, Pittsburgh, for cold-rolled strips, and several local makers say if manufacturing costs continue to increase, they will have to advance their prices.

Nuts and Bolts.—Jobbers and consumers alike bought heavily for the present quarter, and are specifying freely against contracts, but the demand since the first of this month has been quiet. Owing to the uncertainty of future costs, none of the local makers of nuts and bolts will sell for fourth quarter. Most of the demand at present is coming from automobile builders and from car shops. Discounts as adopted late in June are given on page 183.

Coal and Coke.—The situation in the coal strike from the standpoint of production, and also for an early settlement of the strike, are worse to-day than at any time since April 1, when the coal strike started. The facts as to the strike are given elsewhere in this issue. We now quote both blast furnace and foundry coke at $11 per net ton at oven. Connellsville steam coal is $5 at oven and West Virginia coal from $4.50 to $5 per net ton at oven.

Sheets.—Leading mills are sold up on sheets to October, and production has been very much curtailed, due to the coal and railroad strikes. Owing to the serious situation, some independent mills have withdrawn all prices, and others may do so soon unless the situation quickly clears up. This week the American Sheet & Tin Plate Co. is operating to 83 per cent of sheet mill capacity, but reports that production is very much curtailed, owing to scarcity of men, and inability to get coal promptly. Several of the large automobile builders have had men here for more than a week trying to accelerate shipments. Unless the coal and railroad strikes are soon settled, higher prices for sheets

(*Continued on page* 182)

Chicago

Little Trouble Due to Shopmen's Strike, But Future Curtailment Feared

CHICAGO, July 18.—While not yet a curtailing factor in iron and steel plant operations in this district, the strike of the railroad shopmen does loom up as a possible restrictive influence later. The railroads tributary to this city, with one or two exceptions, lately have been scurrying around in an effort to find private shops which will do car repair work, ordinarily performed in their own shops. One system even has gone so far as to offer to send its loyal workers to a plant in the city in an effort to get this plant to take on the contract. Generally, the jobs involved are too small to interest the car builders and it begins to look as though a great number of cars would not be available for the heavy demands of the crop moving period and should the demands for cars for coal shipments be large at the same time, it is declared with some positiveness, a shortage of equipment could hardly be escaped.

So far complaints of delays to shipments as a result of the shopmen's strike are not numerous. And the plants in this territory, as yet, are not suffering from the fact that fuel is not abundant, except that more capacity would be engaged than now is the case if the uncertainty as to fuel supplies were removed. The Steel Corporation plants here are running slightly in excess of 84 per cent of capacity, or substantially at the same gait as last week, and there has been no particular change in either direction as far as the independents are concerned. Railroad supplies, track equipment in particular, still are in brisk demand and there has not yet been any perceptible slackening in the automotive demand for steel bars. As a general proposition, however, this market is quieter than it has been. As typified by mill order books and the specification coming to the manufacturers against orders, business still is good, but it is pretty generally admitted that new inquiries are fewer and this occasions considerable surprise, since the ordinary signs point so generally to a tighter, rather than an easier, supply situation later in the year. Mills here are not particularly eager for business. This usually gives a market a quiet appearance and in addition, buyers probably are waiting on definite results from the labor troubles before mapping out their policies.

Price changes have been few, but generally the market is firm, about the only exception being sheets and in this product the situation is easier chiefly as to supplies and this means that buyers do not have to pay more than the Steel Corporation prices. Bar iron has moved up in this market to a minimum of 1.90c.

Intimations of a possible increase in wages of steel plant labor are heard here, but the common belief is that if such a step is taken, it will not be until after the coal and railroad strikes are out of the way.

Pig Iron.—Demand has been light and sales small except for a couple of lots of Southern foundry, one of about 2000 tons and the other of 4000 tons, sold to local melters on a basis of $18, Birmingham, for No. 2 grade. Incidentally, this business marked the passing of that price, as the company which lately has been naming it to-day advanced to $18.50. In general, melters have shown little interest beyond their immediate requirements. Outside of the stiffening in the minimum price on Southern foundry iron, prices are unchanged, but the market is best described as firm, since available supplies are moderate and costs are high, and must remain so as long as the coal strike is unsettled. The trade is much interested in the further reductions in pig iron freight rate from the Birmingham district, which Southern roads have asked the Interstate Commerce Commission to sanction. The proposed new rates would be $3.53 to Cincinnati and Evansville as against the rate which became effective July 1 of $4.05 to those points, while the proposed rate to Louisville is $3.24 against $3.72 at present and to St. Louis $4.22 against the present rate of $5.17. The failure of Northern roads to concur in the suggestion of Southern roads, however-means that the combination rate from Birmingham to Evansville to Chicago, would be $6.13 as against the present through rate of $6. If Southern iron can get into St. Louis as cheaply as is indicated by the proposed tariff, it might for a time be disturbing to Chicago district furnaces now serving that market. Either Southern prices would have to move up or Chicago prices decline to restore the normal relation.

Quotations on Northern foundry, high phosphorus malleable and basic irons are f.o.b. local furnace and do not include a switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards, or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$31.65
Northern coke, No. 1, sil. 2.25 to 2.75	$24.50 to 25.50
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	24.00 to 25.00
Northern high phos.	24.00 to 25.00
Southern No. 2	24.50 to 26.00
Malleable, not over 2.25 sil.	24.00 to 25.00
Basic	24.00 to 25.00
Low phos. Valley furnace, sil. 1 to 2 per cent copper free	34.00 to 35.00
Silvery, sil. 8 per cent	37.29

Ferroalloys.—Activity is lacking in all materials, but recent prices hold and in ferromanganese for early delivery the market is slightly firmer. Spot tonnages of this material, all of British origin, now are held at $72.50, New Orleans, or $80.06 delivered this district. For future shipment $67.50, seaboard, still is possible.

We quote 78 to 82 per cent ferromanganese, future, $75.06; prompt, $80.06, delivered; 50 per cent ferrosilicon, $55 to $62.50, delivered; spiegeleisen, 18 to 22 per cent, $46. delivered.

Bars.—The expected falling away in the demand for steel bars from the automotive industry has not yet developed; indeed, surprise is expressed over the way demand from this source holds up. It now looks as though there would be no considerable lapse between the passing of the automotive demand and the starting up of buying by agricultural implement manufacturers, who are expected to be active within the next 30 days. The mills in this territory all are heavily committed and are discouraging new business, unless buyers are willing to accept delivery at their convenience. Demand is essentially for early deliveries and inability of makers to take such business has occasioned increased demands upon makers of iron bars to replace steel. The market is stronger on iron bars, which now are quoted at 1.90c., Chicago, minimum, and even 2c. on small and less desirable business. These prices compare with the recent range of 1.80c. to 1.85c. Labor and fuel costs, as well as the heavier demand, account for this advance. Hard bars are firm at unchanged prices.

Mill prices are: Mild steel bars, 1.75c. to 1.85c., Chicago; common bar iron, 1.90c. to 2c., Chicago; rail carbon, 1.70c., mill or Chicago.

Jobbers quote 2.48c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.40c. for rounds and 3.90c. for flats, squares and hexagons. Jobbers quote hard and medium deformed steel bars at 2.38c. base. Hoops, 3.48c. Bands, 3.23c.

Bolts and Nuts.—New business is exceedingly light, due to the fact that buyers generally got under cover at the prices in effect prior to July 1 On such business as is coming out, however, the new discounts are closely observed. The discounts given on page 183 are those applicable to this territory, except that they are figured on a Chicago instead of a Pittsburgh base.

Jobbers quote structural rivets, 3.10c.; boiler rivets, 3.20c.; machine bolts up to ⅝ x 4 in., 50, 10 and 10 per cent off; larger sizes, 50 and 10 off; carriage bolts up to ⅝ x 6 in., 50 and 5 off; larger sizes, 45 off; hot pressed nuts, squares and hexagons, tapped, $3.25 off; blank nuts, $3.50 off; coach or lag screws, gimlet points, square heads, 60 per cent off; quantity extras are unchanged.

Wire Products.—New demands show a seasonable paucity, particularly from the agricultural regions, where the farmers are busy afield and making few purchases. The leading interest is well sold ahead and is not making much progress in reducing its obligations, owing to the fuel situation and the fact that labor is rather short, and, as usual at this time of the year, not

particularly efficient. Independent companies generally are meeting the Steel Corporation prices, though usually asking $2 a ton more on all products except plain wire. Mill prices are given on page 183.

We quote warehouse prices, f.o.b. Chicago: No. 9 and heavier black annealed wire, $3.10 per 100 lb.; No. 9 and heavier bright basic wire, $3.25 per 100 lb.; common wire nails, $3.25 per 100 lb.; cement coated nails, $2.75 per keg.

Sheets.—Inquiry is considerably less than it was recently, but makers note no material dimunition in the demand as typified by specifications on orders. The Inland Steel Co. is pretty well sold up against third quarter production, but while not actively seeking further obligations, it does occasionally manage to slip in a little additional tonnage for regular customers. Several Eastern mills, which did not fill up on third quarter business in the belief that prices would advance, now are taking business at the Steel Corporation bases of 3.15c. for black, 4.15c. for galvanized and 2.40c. for blue annealed, all f.o.b. Pittsburgh. Indeed, as far as this territory is concerned, there does not seem to be much basis for higher quotation, based on sales.

Mill quotations are 3.15c. to 3.30c. for No. 28 black, 2.40c. to 2.50c. for No. 10 blue annealed and 4.15c. to 4.30c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote blue annealed, 3.63c.; black, 4.45c.; galvanized, 5.45c.

Structural Material.—There is a very steady demand for small tonnages, both against structural projects and for stock and since none of the local mills can promise deliveries in quicker than 90 days, more or less business is going to Eastern mills, some of which are in shape to make fairly early shipment. Prices here hold unchanged at from 1.75c., as quoted by the Steel Corporation subsidiary for indefinite delivery, up to 1.85c., as quoted by some of the independents. These prices are well below the delivered prices of Eastern mills, but willingness to pay merely emphasizes the inability of local mills to take on prompt tonnages. No big structural lettings have come out here lately and the common opinion is that there will not be many during the next 30 or 60 days, ordinarily a quiet period, although all companies are figuring upon a large number of projects.

The mill quotation on plain material is 1.75c. to 1.85c., Chicago. Jobbers quote 2.58c. for plain material out of warehouse.

Cast Iron Pipe.—Considerable business still is pending, but actual orders are not especially numerous. Makers are to be well filled up as a result of the liberal bookings of the past two months and are less eager for business at current quotations. Mitchell, S. D., has asked for prices on 300 tons of 4- to 10-in., and Belle Plain, Iowa, on 200 tons of 6-, 8 and 10-in.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $49.70 to $50.70; 6-in. and above, $45.70 to $46.70; class A and gas pipe, $3 extra.

Reinforcing Bars.—The Inland Steel Co., Chicago, has taken 1100 tons for the Grant Park Stadium, Chicago. The Corrugated Bar Co. will furnish 500 tons for a Government hospital at St. Louis. New inquiries are fewer than they have been.

Coke.—Prices of by-product foundry grade range at $10.75 to $11.25, delivered Chicago. These prices are the same as those of a week ago.

Plates.—Not only are local makers as heavily committed as they wish to be, but the indications are that this condition is going to continue, because the railroads still have pretty ambitious programs for the remainder of the year, both as regards new cars and repairs to old ones. Pending inquiries are reported to exceed 15,000 new cars and the number of old cars to be put into the shops in the next few weeks is even greater than that total. Since the railroads are anxious to avoid shortages, or at least minimize them, during the period of heavy coal and crop movements, it is likely that much of this business will be let promptly. There is not much demand for plates for tanks or structural work at present. The maker quoting 1.75c. is not able to make early deliveries and the higher quotations also refer to deferred shipments. The Inland Steel Co. is holding to 2c. base, Chicago, for light plates.

The mill quotation is 1.75c. to 1.85c., Chicago. Jobbers quote 2.58c. for plates out of stock.

Rails and Track Supplies.—Evidently, the coal mine operators are expecting an early termination of the strike, as local interests lately have been getting a good many inquiries for light rails and track supplies from this source. The railroads are ordering steadily of spikes, angle bars and bolts, but are not taking on many tie plates. Prices are stronger on spikes and bolts, with 2.25c. to 2.35c. base, Pittsburgh, now quoted by leading makers and track bolts held at 3.25c. to 3.35c. base, Pittsburgh.

Standard Bessemer and open-hearth rails, $40; light rails rolled from new steel, 1.75c., f.o.b. makers' mills.

Standard railroad spikes, 2.25c. to 2.35c., Pittsburgh; track bolts with square nuts, 3.25c. to 3.35c., Pittsburgh; tie plates, steel and iron, 1.85c., f.o.b. mill; angle bars, 2.40c., f.o.b. mill.

Old Material.—Prices continue to move upward in this market, notably so on those grades finding other than steel works use, and particularly on the light material for blast furnace use. Offerings of scrap by the railroads are not at all heavy, nor is much country scrap reaching the market; meanwhile, dealers hesitate to let go of yard holdings at current prices. Prices might advance if there should be an early termination of the coal strike, thus removing the restrictions on steel works operations which the lack of big reserve coal stocks entails. But it may be argued that the end of the coal strike will mean an ample supply of coke and an increased iron production and the displacement of scrap by pig iron. Rerolling rails are up at least 25c. a ton, as a result of a better demand inspired by the improved outlook for light rails and reinforcing bars. There seems to be little heavy melting steel available at less than $16 per gross ton. We advance prices on practically all materials sold on a per gross basis on an average, about 50c. per ton. Cut forge and No. 2 wrought grade are going frequently as steel and command more money. The Northern Pacific list, on which bids close to-day, contains 1500 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$18.50 to $19.00
Cast iron car wheels	19.50 to 20.00
Relaying rails	22.50 to 27.50
Rolled or forged steel car wheels	18.50 to 19.00
Steel rails, rerolling	16.25 to 16.75
Steel rails, less than 3 ft	17.50 to 18.00
Heavy melting steel	15.50 to 16.00
Frogs, switches and guards cut apart	15.50 to 16.00
Shoveling steel	15.00 to 15.50
Drop forge flashings	11.50 to 12.00
Hydraulic compressed sheet	13.50 to 14.00
Axle turnings	13.50 to 14.00
Per Net Ton	
Iron angles and splice bars	17.50 to 18.00
Steel angle bars	14.75 to 15.25
Iron arch bars and transoms	18.00 to 18.50
Iron car axles	22.50 to 23.00
Steel car axles	15.50 to 16.00
No. 1 busheling	12.00 to 12.50
No. 2 busheling	6.75 to 7.25
Cut forge	13.75 to 14.25
Pipes and flues	10.50 to 11.00
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	13.75 to 14.25
Steel knuckles and couplers	16.25 to 16.75
Coil springs	16.50 to 17.00
No. 1 machinery cast	17.00 to 17.50
No. 1 railroad cast	16.00 to 16.50
Low phos. punchings	15.00 to 15.50
Locomotive tires, smooth	13.00 to 13.50
Machine shop turnings	8.50 to 9.00
Cast borings	11.50 to 12.00
Stove plate	14.50 to 15.00
Grate bars	13.50 to 14.00
Brake shoes	14.00 to 14.50
Railroad malleable	15.50 to 16.00
Agricultural malleable	15.50 to 16.00

Obstacles have been encountered in completing the merger of the Electric Alloy Steel Co., Youngstown, Ohio, and the Atlas Crucible Steel Co., Dunkirk, N. Y., which was recommended by directors of both companies. Additional meetings of interested parties have been recently held, but no definite conclusion has been reached. Opinion is voiced, however, that the merger will eventually be consummated.

Philadelphia

Buying Declines Sharply—Furnace and Mill Operations Curtailed

PHILADELPHIA, July 18.—The combination of the coal and railroad strikes is beginning to have a serious effect upon the iron and steel industry. Not only has buying slumped considerably, but operations also are being affected with the prospect that the situation will become worse before the efforts of the Administration at Washington to restore mining and railroad transportation shall have become effective. The troubles which have arisen within the past few days are due mostly to railroad congestion and the inability of the roads to keep cars moving from the mines to points of coal consumption. Among the roads which tap Eastern territory, the Baltimore & Ohio, the Chesapeake & Ohio and the Norfolk & Western are the most seriously affected, and, where possible, shipments are being routed over the Pennsylvania and Philadelphia & Reading, which are comparatively free from trouble. The agreement which the Pennsylvania has just concluded with its men will undoubtedly clear that road of difficulties, while the Reading has had no strike on its lines. Congestion of freight cars at junction points is beginning to cause trouble.

The first steel mill seriously affected by shortage of coal was the Central Iron & Steel Co. at Harrisburg, which has withdrawn from the market. This plant will utilize fuel oil but will confine its work solely to orders on hand for the present. The Bethlehem Steel Co. has been obliged to withdraw two blast furnaces from operation at Bethlehem, while the Replogle Steel Co., which has been drawing partially upon Bethlehem for coke, is so short of fuel that it has temporarily stopped selling pig iron from its one active furnace at Wharton, N. J.

In some lines business has come almost to a standstill. This is not true so much in finished steel as in pig iron, ferroalloys and scrap. Meanwhile prices remain firm, and the tendency in finished steel is toward greater strength.

Pig Iron.—The effect of the coal and railroad strikes on blast furnace operation is being more seriously felt than at any time since the strikes began. The Bethlehem Steel Co. has been obliged to discontinue two furnaces at Bethlehem, while the Replogle Steel Co., which is partially dependent on Bethlehem for coke, is so short of fuel that it has withdrawn from the market. Other Eastern furnaces, if they are selling at all, are doing so with great caution. Only a few thousand tons of foundry iron has been sold within the past week, mostly by one furnace, and in other grades there is little or no activity. There is little demand from users of foundry iron, who complain that the present high prices do not permit them to compete successfully for castings, on which market prices are relatively lower than for pig iron. The consequence is that the foundries are going along with the iron they have on hand or under contract and are trusting that increased production of coal and coke will bring pig iron prices down when the coal strike is settled. Prices asked for foundry iron vary from $25 to $27, furnace, for No. 2 plain and from $26 to $28, furnace, for No. 2 X

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia, and include freight rates varying from 76 cents to $1.64 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$27.14 to $27.76
East. Pa. No. 2X, 2.25 to 2.75	27.64 to 28.76
East. Pa. No. 1X	29.14 to 29.76
Virginia No. 2 plain, 1.75 to 2.25 sil.	29.17 to 30.17
Virginia No. 2X, 2.25 to 2.75 sil.	30.17 to 31.17
Basic delivery eastern Pa.	25.75 to 26.75
Gray forge	25.50 to 26.00
Malleable	27.50 to 28.00
Standard low phos. (f.o.b. furnace)	30.00
Copper bearing low phos. (f.o.b. furnace)	30.00

Ferroalloys.—There is a demand for carload lots of ferromanganese for prompt shipments, but sellers have little, if any, available for delivery before August or September. Spot ferromanganese is quoted at $70, while for forward delivery the price named for both British and domestic alloy is $67.50, seaboard. Spiegeleisen is quoted at $35 for 16 to 19 per cent, and at $36 for 19 to 21 per cent.

Semi-Finished Steel.—Open hearth rerolling billets are quoted at $35 and forging billets at $40, Pittsburgh, with little demand.

Plates.—The Central Iron & Steel Co. is the first Eastern plate manufacturer whose plant has been affected by coal shortage. This plant will use fuel oil. It has withdrawn from the market. Another Eastern steel company is close to the end of its coal reserves and is virtually out of the market on all of its products. Prices are firm and the market this week is nearer 1.80c., Pittsburgh, than 1.70c. There is a fairly good demand for plates and premium prices are being paid in some instances, particularly for prompt delivery to the Pittsburgh district, sales having been made at 2c. and 2.05c., Coatesville mills. A sale is noted of 300 tons of 3/16 in. plates at 2c., base, Pittsburgh. The Baldwin Locomotive Works is in the market for considerable steel, it having taken orders for 75 new locomotives, 50 from the Baltimore & Ohio and 25 from the Reading, and more than 200 for repairs, including 100 from the Erie, 50 from the New York Central, 30 from the New York, New Haven & Hartford and 40 from the Baltimore & Ohio. Three or four inquiries that are pending total about 100 locomotives. The Newport News Shipbuilding & Dry Dock Co. will require about 4500 tons of steel, mostly plates, for two steamers it has contracted to build for the Ocean Steamship Co. The War Department is to build four dredges, requiring 1000 tons of plates each, and a Delaware River shipbuilding company has asked for prices on the steel. The Pennsylvania Railroad has bought more car repair material, its purchases within the past two weeks totalling 8000 to 10,000 tons. Eastern plate mills have decided to restore the cutting extras which were dropped a few months ago. We quote sheared plates, ¼ in. and heavier, at 1.70c. to 1.80c., Pittsburgh.

Structural Material.—A publishing building for the United Lutheran Church at Thirteenth and Spruce Streets and a similar structure for the Reformed Church at Fifteenth and Race streets, each requiring about 1000 tons of steel, are up for bids. The Bethlehem Steel Co. has been awarded 300 tons of H sections for an office building for the Westinghouse Electric & Mfg. Co., Philadelphia. Plain material is in fair demand and the market is firm at 1.70c., Pittsburgh, while some makers are quoting 1.75c. and 1.80c.

Warehouse Business.—The present situation has caused more consumers to look to the warehouses for material and sales out of stock have picked up materially within the past week. Prices are unchanged and for local delivery are quoted as follows:

Soft steel bars and small shapes, 2.55c.; ironbars (except bands), 2.55c.; round edge iron, 2.75c.; round edge steel, iron finish, 1½ x ½ in., 2.75c.; round edge steel planished, 3.50c.; tank steel plates, ¼-in. and heavier, 2.65c.; tank steel plates, 3/16-in., 2.85c.; blue annealed steel sheets, No. 10 gage, 3.40c.; black sheets, No. 28 gage, 4.25c.; galvanized sheets, No. 28 gage, 5.25c.; square twisted and deformed steel bars, 2.65c.; structural shapes, 2.65c.; diamond pattern plates, ¼-in., 4.35c.; 3/16-in., 4.50c.; spring steel, 3.50c.; round cold-rolled steel, 3.20c.; squares and hexagons, cold-rolled steel, 3.70c.; steel hoops, No. 13 gage and lighter, 3.45c.; steel bands, No. 12 gage to 3/16-in., inclusive, 3.20c.; iron bands, 3.90c.; rails, 2.36c.; tool steel, 8c.; Norway iron, 5.50c.; toe calk steel, 4.50c.; tire steel, 2.65c.; planished tire steel, 3.40c.

Bars.—The largest inquiry for steel bars is for 3500 tons of reinforcing quality for a water filtration plant at Buffalo. The Thompson-Starrett Co., New York, has the general contract. In common with the slump in demand for all steel products, steel bars are not so active, but there is a fair demand and it is difficult to buy for early delivery below 1.80c., Pittsburgh. Bar iron is quoted at 1.60c., Pittsburgh, for carloads and at 1.80c. for less carloads.

Sheets.—Most of the users of sheets appear to be well covered on contract and there is very little demand

for spot material. Prices quoted for prompt delivery are $4 or $5 a ton above the third quarter contract prices.

Coke.—Furnace coke is almost unobtainable at any price, while carload lots of foundry coke have been sold at prices ranging from $10.50 to $11.50, Connellsville. By-product coke is quoted at $12.50, Swedeland, Pa.

Old Material.—The scrap market is so quiet that the prices quoted this week are largely nominal. There are few transactions, but the general trend is toward weakness. We quote for delivery to consumers' works in this district as follows:

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$15.00 to $15.50
Scrap rails	15.00 to 15.50
Steel rails, rerolling	17.00 to 17.50
No. 1 low phos., heavy 0.04 and under	22.00 to 24.00
Cast iron car wheels	17.50 to 18.50
No. 1 railroad wrought	17.00 to 17.50
No. 1 yard wrought	15.00 to 15.50
No. 1 forge fire	13.00 to 13.50
Bundled sheets (for steel works)	13.00 to 13.50
No. 1 busheling	12.50 to 13.00
No. 2 busheling	10.00 to 11.00
Turnings (short shoveling grade for blast furnace use)	13.00 to 13.50
Mixed borings and turnings (for blast furnace use)	13.00 to 13.50
Machine-shop turnings (for steel works use)	13.00 to 13.50
Machine-shop turnings (for rolling mill use)	13.50 to 14.00
Heavy axle turnings (or equivalent)	14.00 to 14.50
Cast borings (for steel works and rolling mills)	14.00 to 14.50
Cast borings (for chemical plants)	16.50 to 17.50
No. 1 cast	17.50 to 19.50
Railroad grate bars	14.50 to 15.00
Stove plate (for steel plant use)	15.00 to 15.50
Railroad malleable	15.00 to 15.50
Wrought iron and soft steel pipes and tubes (new specifications)	13.00 to 13.25
Shafting	20.00 to 20.50

Boston

BOSTON, July 18.

Pig Iron.—Sales in this territory the past week approximate 3,000 tons, including 450 tons of foreign iron. The General Electric Co.'s purchase of 750 tons of Buffalo iron on a $24.50 furnace base constitutes the largest individual transaction. Of this amount 500 tons is silicon 3.25, minimum, for the Lynn, Mass., plant, and 250 tons of silicon 3.26 to 3.75 for Pittsfield, Mass., July and August delivery. Additional small tonnages of other Buffalo iron were taken by melters at $25 base furnace. Other sales include 500 to 600 tons eastern Pennsylvania No. 2X and No. 1X, in small lots, at $26.50 and $27 furnace for the former, and $27.50 and $28 for No. 1X, third quarter delivery; 150 tons special analysis Virginia for mixture purposes at private terms, and a car of lake charcoal at $28.50 base furnace. A western Pennsylvania furnace, competing with Buffalo interests in this territory, has advanced its price $1 to $26 for No. 2X and $27 for No. 1X furnace. Foreign iron sold was 400 tons French silicon 2.50 to 3.00, July shipment, to a Massachusetts stove maker, on a delivered basis $3 to $4 under domestic quotations, and 50 tons Scotch of No. 2X, August shipment, to a Massachusetts jobbing foundry, on a delivered base about $1 under domestic. Several tentative inquiries are out on domestic iron for fourth quarter delivery, but the only new inquiry for nearby delivery is 100 tons of low phosphorus for the Boston Navy Yard.

We quote delivered at common New England points as follows, having added to furnace prices $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

East., Penn., sil 2.25 to 2.75	$30.15 to $30.65
East. Penn., sil. 1.75 to 2.25	29.65 to 30.15
Buffalo, sil. 2.25 to 2.75	29.91 to 30.41
Buffalo, sil. 1.75 to 2.25	29.41 to 29.91
Alabama, sil. 2.25 to 2.75	28.60 to 30.10
Alabama, sil. 1.75 to 2.25	28.10 to 29.60

Ferroalloys.—Although not active, the demand for ferromanganese in this territory shows more life. Wire making interests are the largest buyers, others taking small tonnages, on a basis of $67.50 c.i.f. Boston.

Finished Material.—The Phoenix Bridge Co. is awarded 1300 tons of structural steel for a Tomlinson, Conn., bridge, and the Bethlehem Steel Co. 172 tons of beams for the East Boston street railway loop. Bids will be opened to-day on approximately 900 tons of structural steel for the State pier, Portland, Me. Bids on several round tonnages of structural steel have been rejected within the past 10 days, and will be asked to be refigured. One Pennsylvania mill, which recently re-entered the structural steel market, has secured a comfortable backlog and has raised its price to 1.70c. Pittsburgh base, which is more in line with the other mills. A Buffalo mill is making more prompt deliveries on all products, having secured additional labor, but Pennsylvania mill deliveries have not improved. All mills report little new business booked so far this month, and prices unchanged.

Warehouse Business.—The movement of iron and steel out of New England warehouses shows no expansion, barely holding its own. Contrasted with a year ago, however, business, according to some interests, is 60 to 75 per cent better. Warehouse stocks are in good condition and presumably enough to carry the trade along two months, with an occasional fill-in lot from mills. Prices are firm and unchanged.

Jobbers quote: Soft steel bars, $2.60½ per 100 lb. base; flats, $3.25½; concrete bars, $2.75 to $2.88; structural steel, $2.60½ to $2.70½; tire steel, $4 to $4.35; open-hearth spring steel, $4.50 to $6; crucible spring steel, $11.50; steel bands, $3.75; hoop steel, $4.25; cold rolled steel, $3.50 to $4; refined iron, $2.60½; best refined iron, $4.25; Wayne iron, $5.50; Norway iron, $6 to $6.50; plates, $2.70½ to $2.87½; No. 10 blue annealed sheets, $3.75 per 100 lb. base; No. 28 black sheets, $4.90; No. 28 galvanized sheets, $5.90.

Coke.—New England by-product coke producers have advanced crushed coke 50c. a ton to $12 ovens for spot, $11 for contract, and $12.50 for tonnages to be delivered outside New England. On foundry coke the market is strong and unchanged at $14.50 delivered where the local freight does not extend $3.10 on spot. The contract price is nominal at $13.50 delivered, both producers still remaining out of the market. Developments in the railroad strike situation have caused foundries to take their full monthly contract allotments, which makes for greater activity at ovens. Spot Connellsville coke sold the past week to New Hampshire foundry interests at $10.25 ovens or $15.59 delivered, $1.09 above the delivered price of by-product coke made in this territory.

Old Material.—Important old material interests are fairly busy making shipments to Pennsylvania on contracts placed heretofore, but report almost no new business the past week. On new contracts, interest centers almost exclusively in borings and turnings. Several hundred tons of cast iron borings, suitable for chemical purposes, have been purchased at around $11 on cars shipping point, and a few mixed turnings at $9.50. It is intimated purchases will be made this week of heavy melting steel for Pennsylvania mill consumption. Additional deliveries of stove plate at $15.50 Norwood, Mass., are noted, but this material appears in short supply at that price. Boston brokers say they cannot interest New England foundries in machinery cast. These melters are still able to supply requirements from local yards, or from out-of-town yards, who make delivery by truck, which works out to better advantage to the melter than railroad transportation.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$19.00 to $20.00
No. 2 machinery cast	17.00 to 18.00
Stove plate	14.00 to 14.50
Railroad malleable	15.00 to 15.50
Street car wheels	18.00 to 19.00

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$11.00 to $11.50
No. 1 railroad wrought	11.50 to 12.00
No. 1 yard wrought	10.00 to 10.50
Wrought pipe (1 in. in diam., over 2 ft. long)	8.00 to 8.50
Machine shop turnings	8.50 to 9.00
Cast iron borings, rolling mill	9.50 to 10.00
Cast iron borings, chemical	10.50 to 12.00
Blast furnace borings and turnings	8.50 to 9.40
Forged scrap and bundled skeleton	8.00 to 8.50
Street car axles and shafting	14.50 to 15.00
Rerolling rails	11.00 to 11.50

Recent fire at the plant of the Atlantic Refining Co., Franklin, Pa., resulted in the loss of only one tank out of several hundred in the plant. The company is not in need of new material or equipment.

San Francisco

Active Competition in Water Freights Has Marked Effect on Market

SAN FRANCISCO, July 12.

Pig Iron.—A moderately good business has prevailed on the Coast, but individual buyers are not disposed to take more material than satisfies their daily needs, so that sales have been almost exclusively in small lots. It is estimated by the principal handlers of foreign iron that around 1000 tons of English material has been sold for San Francisco and Los Angeles delivery during the past fortnight. The market appears easier at present with offerings of No. 1 quality at close to $29, ex-ship, Pacific Coast ports. A feature of the recent trading was the sale of 250 tons of Chinese iron, made under an old contract, at $31, ex ship. Due to high quotations from the Orient, there have been no sales of Chinese material in this market for a number of months. Domestic pig iron continues inactive, as no attractive rates have been offered of late. Moreover, the highly competitive rates being quoted by intercoastal steamship operators are tending to restrict business.

Cast Iron Pipe.—The greatest activity at present seems to be in soil pipe, which reflects a consistent demand. Many of the large makers are reported sold up for at least 60 days, with the result that a good deal of new business is being rejected. Prices, however, are unchanged. The trade is watching with interest the existing rate war being waged between intercoastal lines, and while the new reductions in freights do not affect shipments from the South, there is some speculation as to whether the attractive figures in the North will encourage business between Atlantic Coast water pipe foundries and the Pacific Coast, an unusual situation. There is no apparent change in the market of heavy pipe, the delivered price approximating $50 for 6-in. and $54 for 4-in. Both municipal and private business is quiet.

Finished Iron and Steel.—The active competition in water freights is having a marked effect on business in finished materials, and few makers report any new contracts of considerable size. Consumers, in other words, are showing a tendency to purchase cautiously and for their immediate requirements only. Some confusion is apparent, due to mills quoting on different bases, some being delivered, some tidewater and others f.o.b. Pittsburgh. The result is that it is difficult to ascertain a real market on heavy materials. A few mills are quoting as much as $7 a ton higher than the Steel Corporation prices, but are offering quick delivery. This situation, however, is considered as temporary only, and it may be said that the steel business on the Coast is active and fundamentally sound. More than one large maker reports June as the best month in a year and a half. There are a few large prospects in the market at present, one for 5200 tons and another involving 1200 tons of heavy products. A carlot business is being done in sheets and plates. There is nothing new in the bar situation. Bolts and nuts are quiet so far this quarter after the heavy buying last. The Penn Bridge Co. was low bidder on the Snake River bridge at Central Ferry, Wash., which involved about 1000 tons. Oakland has taken 450 tons of girder rails.

Coke.—The Interstate Commerce Commission ruling of July 1 providing for a 10 per cent cut on all freight, both local and transcontinental, on all commodities not reduced since August, 1918, has not affected business in coke, as it probably has on pig iron, because buyers on the Coast seem willing to pay a premium for quick delivery, in any case. A few spot sales of domestic coke are reported, but generally in small quantities. Prices on Birmingham material rule from $7 to $8, f.o.b. ovens, and those on West Virginia beehive are quoted from $8.50 to $9.50. Around 1500 tons of coke from Great Britain, some of which is now in transit, is reported sold for foundry accounts. Dealers and importers are figuring on 1000 tons for a Northern consumer.

Old Material.—There appears to be a firmer tendency in scrap, due apparently to the stiffening in the finished market and to delayed Eastern shipments. A few good-sized sales have been consummated of late, conspicuous among which is that of 5000 tons, offered by the Market Street Railway, at about $11 a gross ton, delivered at buyer's works. The Southern Pacific Co. is offering 1000 tons of wrought iron scrap, 200 net tons of scrap steel axles and 350 of miscellaneous cast iron scrap. The Pacific Gas & Electric is disposing of a quantity of old material to a local dealer. A scarcity of cast iron scrap in this market is reported, and prices appear firm at $22 a net ton, delivered at consumers' works.

Cincinnati

CINCINNATI, July 18.

Pig Iron.—Dullness continues in the Cincinnati iron market, and only a few sales are reported. Southern iron is still avalaible on a basis of $18, Birmingham. The largest sale reported was of 700 tons to a Kentucky implement manufacturer for fourth quarter shipment. It is understood that this order was placed on an $18.50, Birmingham, basis. A sale of 400 tons of Buffalo iron, on a $24, furnace, basis was made in the Wheeling district, and another West Virginia melter took 300 tons of southern Ohio iron on a $24, Ironton, basis. A central Ohio implement manufacturer bought 200 tons of iron, the first in over eighteen months, which is taken as an indication of returning activity in this industry. Inquiry is confined to carload lots for immediate shipment. The railroad strike is becoming serious in this district. Railroads have placed embargoes on coke shipments from West Virginia points, and inablity to move coal is seriously threatening the operation of coke oven plants. The coke supply is so short that a number of furnaces now operating in this district may be forced to bank before the week ends. Shipping instructions are coming forward for third quarter allotments and furnaces are being asked to anticipate shipments wherever possible, but movement of iron is very slow.

Based on freight rates of $3.53 from Birmingham and $2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$21.53
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	22.03
Ohio silvery, 8 per cent	34.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	26.27
Basic Northern	27.27
Malleable	26.27

Warehouse Business.—Local warehouses report a very active demand for their products, as shipments from mills are getting further behind and those now on the way are being held up on account of the railroad strike. The demand for shapes and plates continues to improve steadily and reinforcing bars are also moving in heavier volume. Jobbers of wire products report business as rather light. Prices show little change with the exception that bolts and nuts and screws have been advanced approximately ten per cent.

Jobbers quote: Iron and steel bars, 2.75c. base; hoops, 3.60c.; bands, 3.35c. base; shapes and plates, 2.85c. base; reinforcing bars, 2.82½c. base; cold-rolled rounds, 3.35c. base; flats, squares and hexagons, 3.85c. base; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, 4.50c.; No. 28 galvanized sheets, 5.50c.; No. 9 annealed wire, $2.70 per 100 lb.; common wire nails, $2.85 per keg, base.

Finished Material.—The market, generally speaking, is rather quiet, although the demand for sheets continues in good volume. Specifications are coming in, however, on existing contracts and while shipments are beginning to slow up as a result of the railroad strike, the situation locally has not yet become acute. Practically all of the new business booked is for small tonnages, although occasionally an order running into three figures is accepted. The Big Four Railroad last week took bids on its third quarter requirements of plates, shapes, bars, billets car axles and bar iron. On 1400 tons of car plates the Carnegie Steel Co. was low bidder at 1.60c. Pittsburgh. The Steel Corporation was also low bidder on 75 tons of bars and 500 tons of shapes, the same price being quoted. On 160 tons of billets the Wheeling Steel Corporation was low bidder

at $39 per ton, f.o.b. Pittsburgh, and on 1100 tons of bar iron a western Indiana rolling mill was low bidder at approximately 1.75c. mill. On 700,000 bolts, a Youngstown manufacturer was low bidder; and on 500 tons of car axles, the Cambria Steel Co. was low bidder at 2.395c. On sheets the prices named by the American Sheet & Tin Plate Co. are being more generally adhered to by independent mills, although in some instances higher prices are asked for automobile body sheets. The nail and wire market shows only fair activity, although prices are strong. In the structural field, a number of small projects came up during the week and several awards were reported. On reinforcing bars, the demand continues strong, a number of awards having been made for buildings running as high as 150 and 200 tons.

Coke.—There is a fair demand for foundry coke for prompt shipment, and prices have shot up rapidly during the week. Wise County foundry coke has sold as high as $10.50, ovens, and New River at $10. By-product fuel is generally quoted at $10, ovens, and in some instances even higher prices have been paid. Furnace coke is in extremely short supply, and we note an inquiry from a Cleveland district stack for 36,000 tons. Movement of coke is slow on account of the railroad strike.

Old Material.—There is practically no activity in the local scrap market. Foundries are pretty well supplied, and steel plants in the district are well covered by contracts. Prices are firm, but quotably unchanged.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

Per Gross Ton		
Bundled sheets	$8.00 to	$8.50
Iron rails	13.50 to	14.00
Relaying rails, 50 lb. and up	26.50 to	27.00
Rerolling steel rails	13.50 to	14.00
Heavy melting steel	13.00 to	13.50
Steel rails for melting	13.00 to	13.50
Car wheels	14.50 to	15.00
Per Net Ton		
No. 1 railroad wrought	11.50 to	12.00
Cast borings	9.00 to	9.50
Steel turnings	8.00 to	8.50
Railroad cast	14.00 to	14.50
No. 1 machinery	16.00 to	16.50
Burnt scrap	9.50 to	10.00
Iron axles	18.00 to	18.50
Locomotive tires (smooth inside)	11.00 to	11.50
Pipes and flues	6.50 to	7.00

Buffalo

BUFFALO, July 17.

Pig Iron.—One furnace which quoted $24 a week ago has now advanced to $24.50 base, and has even sold No. 2 plain at $25 base. A curtailment in pig iron production in this district may be a development of the next few weeks, on account of the fuel situation. Good grades of coke are quoted at $14 delivered when it can be obtained. Sales for the week are less than 10,000 tons. The fuel situation with all factors is extremely serious, and all stocks are near exhaustion. Malleable is quoted at $24. One furnace having inquiries for 1000 tons, 600 tons and several for 500 tons is reluctant to quote, not knowing whether it will be able to deliver.

We quote f.o.b. per gross ton Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sil.	$25.00
No. 2X foundry, 2.25 to 2.75 sil.	24.50
No. 2 plain, 1.75 to 2.25 sil.	24.00
Basic	24.00
Malleable	24.00
Lake Superior charcoal	31.78

Finished Iron and Steel.—Bar inquiry has fallen off in several offices. The Steel Corporation and a leading independent are still quoting 1.70c. minimum on bars, and a minimum of 1.80c. is being quoted by a local independent on such business as can be taken for immediate rolling. Nothing is booked for extended delivery by this interest. The same mill is running all departments at full capacity, with the exception of the plate mill, and in that department there is no likelihood that it will be started while prices are as they are and the fuel situation so precarious. A Rochester car shop is in the market for 200 tons of shapes. The Buffalo Steel Car Co. is understood to have bought part of its 8000-ton plate requirement to be used on car repairs at less than 1.75c., and that considerable difficulty was encountered in placing this business. Sheets are quiet. Local sellers quote 3.15c. to 3.30c. on black and 4.13c. to 4.30c. on galvanized. The Steel Corporation is understood to be quoting 4.15c. and other independents 4.30c. on galvanized. Interest in shipments is keen, and pressure for delivery strong, indicating that consumers are using material as fast as it can be delivered. No structural jobs of consequence have appeared. A number of awards ranging from 10 to 25 tons have been booked by a leading fabricator.

We quote warehouse prices, f.o.b. Buffalo, as follows: Structural shapes, 2.65c.; plates, 2.65c.; soft steel bars, 2.55c.; hoops, 3.30c.; bands, 3.15c.; blue annealed sheets, No. 10, 3.55c.; galvanized steel sheets, No. 28, 5.40c.; black sheets, No. 28, 4.40c.; cold-rolled strip steel, 6.05c.; cold-rolled round shafting, 3.35c.

Old Material.—The majority of mills are interested in steel purchases, and the market is strong at $17. There is little available, however, and all dealers' stocks are low. Cast iron borings are scarce, and consumers are offering $14.50 to $15, but there is no rush to fill the orders.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel	$16.75 to $17.00
Low phos., 0.04 and under	18.00 to 19.00
No. 1 railroad wrought	16.00 to 16.50
Car wheels	17.00 to 18.00
Machine shop turnings	10.50 to 11.00
Cast iron borings	14.00 to 14.50
Heavy axle turnings	14.00 to 14.50
Grate bars	14.00 to 14.50
No. 1 busheling	15.00 to 15.50
Stove plate	15.00 to 15.50
Bundled sheet stampings	11.50 to 12.00
No. 1 machinery cast	18.00 to 18.50
Hydraulic compressed	15.00 to 15.50
Railroad malleable	17.00 to 17.50

St. Louis

ST. LOUIS, July 18.

Pig Iron.—The market for pig iron remains firm at unchanged prices, although no sales of consequence were made during the week. Scattering sales of Northern iron up to 100 tons were the rule. The Sheffield maker continues to quote $18.50, Birmingham, while others are offering their product at $19 to $20. Sales of the lowest price iron were about 1200 tons during the week, which nearly all of the Southern make sold. There is a very heavy inquiry for foundry iron of the high-silicon grades, which consumers are not finding particularly easy to purchase. These high-silicon grades are not available from the East Side maker. An Iowa user is in the market for 10,000 tons of standard basic for prompt shipment. An inquiry also has been received from a Birmingham melter for 1000 tons of foundry iron with liberal manganese. It is feared that the melt of iron in the district may be seriously affected because of the shortage of coal. The market for the ferroalloys is quiet, users in the district being well covered with their requirements for some time.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago and $4.22 from Birmingham and 81 cents average switching charge from Granite City:

Northern foundry, sil. 1.75 to 2.25 (third quar.)	$26.66
Northern malleable, sil. 1.75 to 2.25 (third quar.)	26.56
Basic (third quar.)	26.56
Southern foundry, all rail, sil. 1.75 to 2.25	$22.72 to 24.22
Southern foundry, water and rail, sil. 1.75 to 2.25, f.o.b. St. Louis	22.17

Finished Iron and Steel.—Despite the strike, inquiries were issued during the week by railroads centering in the St. Louis district for material for repair work, although small material was mostly wanted. The Missouri-Kansas-Texas has an inquiry out for its requirements of locomotive jacket steel for the last half of the year. It is understood that this road used about three carloads during the first half of the year. The same railroad wants 2500 kegs of standard track spikes. Bids will close on July 25 for Akdar Temple, Tulsa, Okla., involving 219 tons of steel. C. W. & George L.

Robb, Chicago, are the architects. Little interest is being taken in inquiries received by representatives here of steel interests, because their plants not only are well sold up but production is being curtailed because of the coal strike.

For stock out of warehouse we quote: Soft steel bars, 2.57½c. per lb.; iron bars, 2.57½c.; structural shapes, 2.67½c.; tank plates, 2.67½c.; No. 10 blue annealed sheets, 3.72½c.; No. 28 black sheets, cold rolled, one pass, 4.45c.; cold drawn rounds, shafting and screw stock, 3.50c.; structural rivets, $3.19½ per 100 lb.; boiler rivets, $3.29½; tank rivets, 7/16 in. and smaller, 60 per cent off list; machine bolts, large, 50 and 10 per cent; small, 50-10 and 10 per cent; carriage bolts, large, 55-5 per cent; small, 60 and 10 per cent; lag screws, 60 per cent; hot pressed nuts, square or hexagon blank, $3.50; and tapped, $3.25 off list.

Coke.—Coke continues in big demand both from the industries and from the coal trade. The St. Louis producer of by-product coke is sold up through July and is not taking on any new business. Granite City by-product coke is still to be had. Connellsville coke is very difficult to get, the market price being $10.50 at the ovens. The shortage of coal is creating a greater demand for coke as well as tending to curtail its production.

Old Material.—The market for old material continues very strong. Very little railroad scrap is moving because of the strike. Several large buyers are in the market for heavy melting steel and special steel grades. Large tonnages of rolling mill grades are being moved out of the St. Louis district. The general feeling is that after the coal strike is settled, buying will be on a much larger scale.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

	Per Gross Ton	
Old iron rails	$16.75 to	$17.25
Steel rails, rerolling	15.25 to	15.75
Steel rails, less than 3 ft	16.25 to	16.75
Relaying rails, standard section	25.00 to	28.00
Cast iron car wheels	18.25 to	18.75
No. 1 heavy railroad melting steel	14.75 to	15.25
No. 1 heavy shoveling steel	13.50 to	14.00
Ordinary shoveling steel	13.50 to	14.00
Frogs, switches and guards, cut apart	15.00 to	15.50
Per Net Ton		
Heavy axle and tire turnings	9.50 to	10.00
Steel angle bars	13.75 to	14.25
Iron car axles	23.00 to	23.50
Steel car axles	17.00 to	17.50
Wrought iron bars and transoms	18.50 to	19.00
No. 1 railroad wrought	12.75 to	13.00
No. 2 railroad wrought	12.25 to	12.75
Railroad springs	16.00 to	16.50
Steel couplers and knuckles	16.00 to	16.50
Cast iron borings	9.00 to	9.50
No. 1 busheling	11.25 to	11.75
No. 1 railroad cast	15.50 to	16.00
Stove plate and light cast	12.75 to	13.25
Railroad malleable	13.50 to	14.00
Pipes and flues	8.25 to	8.75
Machine shop turnings	8.50 to	9.00

Birmingham

BIRMINGHAM, ALA., July 18.

Pig Iron.—It is positively asserted by those in a position to know that all offerings of iron at $18 had ceased at the end of last week and that makers heretofore quoting $18.50 freely were more inclined to ask $19. The week was dullest in many, with makers holding for $20. Inquiry was sparse. The few sales made at $20 were for small lots and nearby delivery. The feature of the close of the week was the statement of the Sloss-Sheffield Steel & Iron Co. that this concern had booked 26,000 tons of iron up to July 15 on a probable month's make of 35,000 tons. This company booked more than 50,000 tons in June. Even under a five-stack operation, that is regarded as heavy tonnage, preceded as it was by large bookings and facing little or no iron on company yards either on part of this or any other iron maker. The Tennessee company went to nine-furnace operation this week, blowing in a third Bessemer stack on foundry and changing one from foundry to ferromanganese. The Tennessee company's iron operations, like steel, are the heaviest of several years. Delay in publishing the extra low rates to Cincinnati, St. Louis and Louisville announced by the Louisville & Nashville and Southern railroads as well as the two strikes and delays in transit that are apprehended combined in producing a very dull weekend. Production, however, has not set-back and, as a whole, is greatest in steel on record and up to normal in iron.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	$18.50 to $20.00
Basic	18.50 to 19.00
Charcoal, warm blast	30.00 to 32.00

Cast Iron Pipe.—The pressure pipe base is $37, but $38 was gotten by some concerns on recent orders. Plants are principally concerned with deliveries. A cargo of 3,000 tons, pressure and sanitary, left Mobile for the Pacific Coast, delivery from San Francisco to Seattle. The sanitary pipe base is $55, but belated consumers continue offering $60 and $65 for prompt delivery and not all are accommodated.

Finishing Mills.—The Tennessee company continued double turn in finishing mills this week as well as maximum production of ingots. The American Steel & Wire Co. is executing a large wire order for Japan and the Gulf States Steel Co.'s export business includes an order from Palestine. Hoops and bands are moving to Argentine. All steel mills are on near full or full turn.

Coal and Coke.—Railroads are wary of sending cars into the coal fields except for their own use, hence there is some distress. Commercial coal business in the West offers but cannot be served. Spot price is rather stiff at $2.50. Maximum production seems to have been reached. Peru has taken another 4,000 tons of gas coal and Cuba took 3,000 tons. The rail strike has not handicapped coal production or coke movements locally. Coke sells at $5.50 to $6.

Old Material.—The scrap market is rather quiet with deliveries on contracts still going on in a large way. There has been no change in prices. Lower freight rates have not apparently widened territory.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails	$13.00 to $15.00
No. 1 steel	12.00 to 14.00
No. 1 cast	15.00 to 16.00
Car wheels	14.00 to 15.00
Tramcar wheels	13.00 to 14.00
Stove plate	13.00 to 14.00
Cast iron borings	6.00 to 7.00
Machine shop turnings	4.00 to 5.00

New York

Seriousness of Coal Strike Shown in Withdrawal of Iron and Steel Producers from Market

NEW YORK, July 18.—The seriousness of the coal situation is shown in the actual withdrawal from the market temporarily of several important producers of pig iron and steel in the East, while a number of other plants are having difficulty in obtaining coal and coke, and may be compelled at any time to cease operations. Some important sellers of pig iron have virtually withdrawn from the market by naming high prices. News from the coal mines is extremely discouraging. A New York seller who visited West Virginia and Pennsylvania a few days ago says conditions at the mines are even worse than has been reported.

Pig Iron.—The General Electric Co. continues to be the principal buyer of pig iron. In addition to purchases recently made amounting to about 2500 tons for its Lynn and Pittsfield, Mass., and Elizabethport, N. J., plants, it is now in the market for an additional tonnage for New York State plants. It is understood that most of the iron purchased for this company will come from Buffalo, having been bought on a basis of $24 for No. 2 plain. Buying by other companies is limited. One company, which has been selling No. 2 plain at $25.50 and No. 2 X at $26.50, is now out of the market. Small tonnages of foreign iron are being received, but dealers are showing a disposition to be cautious in buying large tonnages. Although such purchases might relieve the scarcity in this country due to the coal strike, many uncertainties are connected with foreign transactions.

We quote delivered in the New York district as follows, having added to furnace prices $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$29.77 to $30.77
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	28.77 to 29.77
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	27.77 to 28.77
Buffalo, sil. 1.75 to 2.25	28.91 to 29.41
No. 2 Virginia, sil. 1.75 to 2.25	29.44 to 30.44

Ferroalloys.—The market is inactive. A little ferromanganese is available for prompt shipment and sales are being made at $70, seaboard. For forward delivery, August or September, the quotation is $67.50, seaboard, for both British and domestic. Spiegeleisen is still quoted at $35 for 16 to 19 per cent, and at $36 for 19 to 21 per cent. Prices on other alloys are found in the table below:

Ferromanganese, domestic, seaboard, per ton	$67.50
Ferromanganese, British, seaboard, per ton	$67.50
Spiegeleisen, 17 to 19 per cent	$35.00
Spiegeleisen, 20 per cent	$36.00
Ferrosilicon, 50 per cent, delivered, per ton	$55.00 to $62.00
Ferrotungsten, per lb. of contained metal	40c. to 50c.
Ferrochromium, 6 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr., delivered	12c. to 14c.
Ferrovanadium, per lb. of contained vanadium	$3.00 to $3.50
Ferrocarbontitanium, 15 to 18 per cent, 1 ton to carloads, per ton	$200.00

Ores

Manganese ore, foreign, per unit, seaboard	25c. to 26c.
Tungsten ore, per unit, in 60 per cent concentrates, nominal	$3.00 up
Chrome ore, basis 48 per cent Cr_2O_3, crude, per unit, Atlantic seaboard	40c. to 45c.
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	40c. to 45c.

Finished Iron and Steel.—The national rail and coal strikes are regarded as responsible for a decided slump in inquiry. It remains, however, that demand is still sufficient in volume to cause mills to scrutinize carefully in the light of their own mill conditions before making any quotations. New railroad equipment buying has halted and little is expected in the next sixty days, seeing that fresh orders would not always mean deliveries of cars in time to be of service for the transportation pressure likely when free movements are again established. For the time being railroad buying is expected to lie largely in repair items. Bar mills are busy and no let up is discernible in the automobile trade. The structural trade is fairly active.

We quote for mill shipments, New York, as follows: Soft steel bars, 2.04c. to 2.14c; structural shapes, 2.04c.; bar iron, 1.94c.; and steel plates, 1.99c. to 2.04c. On export shipments the freight rate from Pittsburgh to New York is 28.5c. per 100 lb., while the domestic rate is 34c.

Cast-Iron Pipe.—Business continues intensely active with most Northern pipe foundries probably from three to four months and more behind on deliveries. While the situation resulting from the coal strike has not yet affected most of them seriously, it is reported that the foundries in the South have been having some difficulty in obtaining iron and are also getting behind on deliveries. No new municipal tenders are reported, but private buying continues strong. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $53.50; 4-in. and 5-in., $58; 3-in., $68.30, with $4 additional for class A and gas pipe.

Warehouse Business.—Another upward revision of prices is expected in this district. Probably the change, if it is made, will amount to a 10c. per 100 lb. advance over present prices, in conformance with the correspondingly higher base of mill prices. The present warehouse quotations are established on a basis of 1.60c. per lb. base, Pittsburgh, for bars. In contrast with the strong condition of practically all other iron and steel items in this market, both black and galvanized sheets are weak, prices ranging downward from the official schedule of 4.35c. and 5.35c. per lb. on black and galvanized respectively, which most warehouses are attempting to maintain, to as low at 4c. and 5c. per lb. Dealers in wrought iron and steel pipe report no change. Brass and copper products have been advanced ½c. per lb. and although the usual late spring and early summer trade has been supplied, business continues active, particularly in both brass and copper materials entering into buildings. We quote prices on page 200.

High Speed Steel.—The market is unchanged. Some producers state that a slight improvement is evident. Prices continue at about 75c. per lb. for 18 per cent tungsten high speed steel, with special brands of some companies selling up to as high as 95c. per lb.

Coke.—Coke prices are advancing rapidly and the lowest price for Connellsville grades which has been named is $11.75, while $12 and $13 has been asked. By-product coke has been advanced 50c. to $11 seaboard for regular customers. Furnace and foundry coke are being sold without much discrimination.

Old Material.—No change in the market is evident and although sales are largely confined to small tonnages, prices are stiff. Based upon quotations of No. 1 heavy melting steel to Monessen of $16.50, to Bethlehem of $14.50 and to Alan Wood of $14, the market here is quotable at $10 to $10.50 per ton. With the possibility of selling scrap into a Buffalo market at $17 per ton, dealers in this district are showing considerable interest in possible sales in that direction. Specification pipe is slighty stronger and now quoted at $8.50 to $9 per ton, while stove plate is off slightly, $10 to $10.50 being a fair estimate of the market.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard	$10.00 to $10.50
Steel rails, short lengths, or equivalent	11.00 to 11.50
Rerolling rails	11.00 to 11.50
Relaying rails, nominal	27.00 to 28.00
Steel car axles	16.00 to 17.00
Iron car axles	22.00 to 23.00
No. 1 railroad wrought	12.50 to 13.00
Wrought iron track	11.00 to 11.50
Forge fire	8.00 to 8.50
No. 1 yard wrought, long	10.50 to 11.00
Cast borings (clean)	9.00 to 10.00
Machine-shop turnings	9.00 to 10.00
Mixed borings and turnings	9.00 to 10.00
Iron and steel pipe (1 in. diam., not under 2 ft. long)	8.50 to 9.00
Stove plate	10.00 to 10.50
Locomotive grate bars	11.50 to 12.00
Malleable cast (railroad)	10.00 to 10.50
Cast-iron car wheels	13.00 to 13.50

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast	$18.00 to $19.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	16.50 to 17.00
No. 1 heavy cast, not cupola size	13.00 to 13.50
No. 2 cast (radiators, cast boilers, etc.)	12.00 to 12.50

Cleveland

Plants Suspend on Account of Strike—Railroads Cannot Handle Coal

CLEVELAND, July 18.—The fuel situation due to the breaking down of the railroad transportation system has become much worse and there has already been some curtailment of the blast furnace and steel plant operations in the Cleveland and Valley districts. In this city the McKinney Steel Co. has banked one blast furnace and shut down three open-hearth furnaces and the Bourne-Fuller Co. has shut down two of five furnaces at its Upson steel plant, which will be compelled to shut down entirely unless the situation improves shortly. The Trumbull-Cliffs furnace in Warren was banked to-day and the Cherry Valley furnace at Leetonia will probably go out during the week. Several other furnaces in Cleveland and other Ohio points have only enough coal for their by-products plants to last them from one to three weeks. The coal strike is a factor to a very limited extent in the present critical situation. The miners in the non-union fields of Kentucky and West Virginia on which the steel plants and blast furnaces are depending almost wholly for fuel are anxious to work, but the railroads are unable to handle coal owing to their inability to keep their motive power in repair because of the shopmen's strike. Very little coal is reaching Ohio mills and coke plants. Virtually no coal is now being shipped over the Norfolk & Western Railroad, little over the Louisville & Nashville and a sharp curtailment over the Chesapeake & Ohio. The Baltimore & Ohio Railroad has placed an embargo on coal from Cincinnati and Columbus to northern Ohio points. The Big Four is still open. The curtailment of transportation facilities has affected the Lake Superior iron ore mining district. The car supply on the Mesabi range has been cut 25 per cent and some producers in order to keep up operations in their open pit mines have discontinued loading cars at stock piles at underground mines.

Iron Ore.—Ore shipments from the mines to the upper lake docks are slowing down because of the bad condition of the motive power of the railroads, due to the shopmen's strike, and a sharp curtailment in the movement is expected before the end of the week. Boats are now being delayed somewhat for cargoes. At present the situation is worse at Superior, Wis., than at other shipping ports. So far there has been little slowing down in ore shipments from Lake Erie to interior furnaces, only two ports, Fairport and Toledo, being much affected. Shippers are experiencing delays in moving ore over the Baltimore & Ohio Railroad from those ports. Although some furnaces have been banked and others may be compelled to shut down for lack of fuel, consumers are taking all the ore they can handle, desiring to get as much in their furnace yards as possible before the situation becomes worse. In case their ore requirements are curtailed by reason of banking the furnaces, they can shut off on shipments earlier in the fall. With virtually no coal moving up the lakes, vessels are going up light for ore, and the lack of sufficient ore cargoes will probably result in the tieing up of a number of boats. Coal for fueling lake vessels is so scarce at lake ports that some boats are getting their fuel from the ports at the head of the lakes. A strike of the firemen on the lake boats is a possibility. Firemen are at present taking a vote on calling a strike Aug. 1. No ore sales are reported and no activity is expected in the market until the present situation clears up somewhat.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, $5.95; Old range non-Bessemer, 51½ per cent iron, $5.20; Mesabi Bessemer, 55 per cent iron, $5.70; Mesabi non-Bessemer, 51½ per cent iron, $5.05.

Pig Iron.—With the present critical fuel situation and uncertainty as to furnace operations, some pig iron producers have advanced prices 50c. to $1 a ton and others have withdrawn from the market. On foundry iron, the $23 price has apparently disappeared, as a Toledo furnace has marked its minimum price up to $23.50. A Cleveland furnace which has been quoting the latter price, but which does not wish any additional orders at present, took a 200-ton lot at $25. Another Cleveland producer continues to quote this grade at $24 and a western Pennsylvania furnace has advanced its price to $25. For local delivery, foundry iron is quoted at $24 in Cleveland, Toledo and Detroit. The market generally is not active, although one interest sold 10,000 tons during the week in lots of 1000 tons and under in foundry and malleable grades. Another booked a foundry iron order for a round lot. The General Electric Co., which was reported to be in the market for 700 tons, sent out additional inquiries for various grades of foundry iron for its Erie plant, aggregating 2000 tons. Of this about 300 tons of high silicon iron has been placed with a Cleveland furnace at $24 base, and it is probable that the remainder will be bought from an Erie furnace. Low phosphorus iron is fairly active. A Valley interest reports sales aggregating 4000 tons, including one round lot. An inquiry is pending from a West Virginia consumer for 500 tons of low phosphorus iron. There seems to be doubt whether additional basic iron can be had for $24, the price at which sales were reported last week at Pittsburgh. A local producer and also a local middleman are still asking $25 for basic iron.

Quotations below are f.o.b. local furnace for Northern foundry iron, not including a 50c. switching charge. Other quotations except basic and low phosphorus are delivered Cleveland, being based on a $3.02 rate from Jackson and a $6 rate from Birmingham:

Basic, Valley furnace	$25.00
Northern No. 2 fdy., sil. 1.75 to 2.25	$23.50 to 24.00
Southern fdy., sil. 1.75 to 2.25	24.50
Ohio silvery, sil. 8 per cent	33.52
Standard low phos., Valley furnace	33.00

Semi-finished Steel.—We note the sale of two lots of re-rolling billets, aggregating 5000 tons by a local mill at $35, Cleveland. Sheet bars and slabs are quoted at the same price, but no sales are reported.

Finished Material.—Some of the independent mills have withdrawn from the market because the fuel shortage may cause them to curtail operations or shut down. New demand is not so active as it has been, but mills are turning away considerable tonnage. Some of the independent mills are now about as far behind on deliveries as the leading producers. Mills are being crowded as hard as ever for deliveries, which seem to be growing somewhat worse. While consumers are trying to accumulate material for stock, some are actually in need of steel for current operations, this being particularly true of steel bars, strip steel, hoops and bands. Forging bars are apparently harder to get than other material. Inquiries are heavier for steel bars than for other lines. Specifications from automobile companies continue heavy and reports indicate that the leading Detroit car builders will keep up their present rate of production during August. There is no change in the price situation. On steel bars, plates and structural material, 1.70c. is generally the minimum quotation for delivery at the mills' convenience. However, there seems to be more of a willingness on the part of some buyers to pay considerably higher prices to be assured early deliveries. Plates are selling up to 2c. for prompt shipment and that is the general market price for the lighter gages. We note the sale of 2000 tons of carbon and alloy steel forging bars to a local consumer and another inquiry for 600 tons is pending. In structural lines, a large amount of building work is still coming out. Preliminary plans are being prepared for the Huron-Lorain bridge, Cleveland, which will require approximately 16,000 tons of steel if steel construction is decided upon, or 4000 tons of reinforcing bars if the bridge is built of concrete.

Jobbers quote steel bars, 2.41c.; plates and structural shapes, 2.51c.; No. 9 galvanized wire, 3c.; No. 9 annealed wire, 2.50c.; No. 28 black sheets, 3.90c. to 4c.; No. 28 galvanized sheets, 4.90c. to 5c.; No. 10 blue annealed sheets, 3.25c. to 3.46c.; hoops and bands, 3.06c.; cold-rolled rounds, 3.20c.; flats, squares and hexagons, 3.70c.

Reinforcing Bars.—The demand is heavy and small sections are scarce. The market is firm at 1.70c. to 1.80c. The general contract for the Buffalo filtration plant requiring 3500 tons has been taken by the Thompson-Starret Co. and the West Seventy-third Street bridge, Cleveland, requiring 230 tons by the Central States Engineering & Construction Co. The Ohio Highway Commission has placed 285 tons with the Concrete Steel Co. for road work. Bids have been taken for 1200 tons for the Western Reserve University group of buildings and bids will be taken July 29 for a Federal-State bridge at Conneaut, requiring 540 tons.

Sheets.—There is still considerable demand from the automobile trade for body sheets, but with this exception the buying is rather limited. Specifications are heavy, but mills are able to make shipments as fast as needed. Some independent mills are still quoting the American Sheet & Tin Plate prices. A leading Valley district producer has reduced its price $2 per ton to 3.30c. for black, 4.30c. for galvanized and 2.50c. for blue annealed sheets.

Coke.—Prices on Connellsville foundry coke have further advanced, carlot sales being made at $10.75 and the supply is very limited. Little, if any, Wise County foundry coke is available for immediate shipment.

Old Material.—The scrap market is weak, particularly on steel making grades, evidently being affected by the situation growing out of the railroad shopmen's strike. Some Valley district consumers have held up shipments and no new buying by the mills is reported. Small lot sales of heavy melting steel have been made locally at $14.75, or 50c. lower than the recent minimum price. Turnings and borings and compressed steel are still fairly firm. Small lot sales of the latter are reported at $16 for Youngstown delivery.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel	$14.75 to 15.25
Steel rails, under 3 ft	15.50 to 15.75
Steel rails, rerolling	15.75 to 16.25
Iron rails	14.00 to 15.00
Iron car axles	18.00 to 19.00
Low phosphorus melting	16.00 to 16.25
Cast borings	12.50 to 12.75
Machine shop turnings	11.50 to 12.00
Mixed borings and short turnings	12.50 to 12.75
Compressed steel	12.85 to 13.25
Railroad wrought	14.00 to 14.50
Railroad malleab'e	15.50 to 16.00
Light bundled sheet stampings	10.00 to 10.25
Steel axle turnings	13.00 to 13.50
No. 1 cast	17.00 to 17.50
No. 1 busheling	10.75 to 11.00
Drop forge flashings over 10 in	10.75 to 11.25
Drop forge flashings under 10 in	10.75 to 11.25
Railroad grate bars	13.75 to 14.25
Stove plate	13.75 to 14.25
Pipes and flues	10.00 to 11.00

British Iron and Steel Market

Cleveland Pig Iron Weakening—Germany Promising Better Wire Deliveries—Tin Plates Lower But Sheets Advanced

(By Cable)

LONDON, ENGLAND, July 18.

Control of Cleveland pig iron prices has been removed and the tendency is downward. Assisted by further impending reductions in railroad rates, 89s. ($19.85) f.o.b. is acceptable for No. 3 G.M.B. Holidays here and disorganized foreign exchanges are checking business.

Hematite is weak and down to 91s. ($20.29) f.o.b. has been done for East Coast mixed numbers. There is some talk of reduced output.

Foreign ore is lifeless and Bilbao Rubio is nominally 25s. ($5.58) ex-ship Tees.

Steel generally is quiet. Germany bought 5000 tons of East Coast shipplates. Belgian merchant bars are quoted up to £7 10s. (1.49c. per lb.) f.o.b.

South America is buying Continental galvanized barbed wire. No. 12 gage has sold at £7 12s. 6d., cost and freight, (3.51c. per lb.) Buenos Aires.

Continental billets have sold for £5 15s. ($25.65) f.o.b.

Continental foundry pig iron is easier at 80s. ($17.84) f.o.b.

German merchant bars are quoted at £7 15s. (1.54c. per lb.) f.o.b., for October delivery. German works are now in a position to supply wire meshing in all sizes.

Tin plates are easier and business quieter. They have sold at 17s. 6d. base, f.o.b. Common wasters are 17s. base.

Galvanized sheet makers have advanced prices but demand has not been stimulated and it is anticipated that prices will again recede in the near future. Rangoon specification sheets sold at £21 f.o.b. There is more enquiry from Japan for black sheets.

We quote per gross ton, except where otherwise stated, f.o.b. maker's works, with American equivalent figured at $4.46 per £1, as follows:

	L	L	L			
Durham coke, delivered	£1	6½s.	to £1	7s.	$5.91 to	$6.02
Cleveland No. 1 foundry	4	15			21.18	
Cleveland No. 3 foundry	4	10			20.07	
Cleveland No. 4 foundry	4	7½			19.52	
Cleveland No. 4 forge..	4	5			18.96	
Cleveland basic	4	10			20.07	
East Coast mixed.....	4	14	& 4	11*	20.96 &	20.29*
Ferromanganese	15	0			66.90	
Ferromanganese*	14	10	to 14	15	64.67 to	65.78
Rails, 60 lb. and up...	7	17½	to 9	10	35.12 to	42.37
Billets	7	0	to 8	0	31.22 to	35.68
Sheet and tin plate bars, Welsh	7	7½			32.89	
Tin plates, base box...	0	19½	to 0	19¾	4.35 to	4.40
					C. per Lb.	
Ship plates	9	0	to 10	0	1.79 to	1.99
Boiler plates	13	0	to 14	0	2.59 to	2.79
Tees	9	5	to 10	10	1.84 to	2.09
Channels	8	10	to 9	15	1.69 to	1.94
Beams	8	5	to 10	0	1.64 to	1.99
Round bars, ¾ to 3 in.	9	5	to 10	10	1.84 to	2.09
Galvanized sheets, 24 g.	15	15	to 16	10	3.14 to	3.29
Black sheets	12	0			2.39	
Steel hoops	12	0	& 12	5*	2.39 &	2.44*
Cold rolled steel strip, 20 g.	23	2½			4.60	
Cotton ties, Indian specifications	15	0			2.99	

*Export price.

British Iron and Steel Exports and Imports

WASHINGTON, July 18.—Iron and steel exports of the United Kingdom during June totaled 236,298 gross tons, a decrease of 36,139 tons under May, according to a cablegram received to-day by the Department of Commerce from Commercial Attache Walter S. Tower, London.

Imports in June aggregated 52,775 tons, a decrease of 8164 tons under May.

Production of pig iron of all grades in June totaled 369,200 tons, instead of the figure given on page 116 of the issue of July 13.

At the close of June there were 115 blast furnaces and 212 open-hearth furnaces in operation. This compares with 110 blast furnaces and 220 open-hearth furnaces in operation at the end of May.

Fuel Oil Substituted for Coal at Valley Steel Plants

YOUNGSTOWN, July 18.—Steel plants are substituting fuel oil for coal wherever possible. Valley independents Tuesday received 43 cars of fuel oil in one trainload.

Owing to scarcity of offerings, there has virtually ceased to be a coal market. Independents are preparing under promise of Federal protection to operate Pennsylvania workings on a larger scale.

The Youngstown Sheet & Tube Co. and Carnegie Steel Co. are maintaining district plants on an 85 per cent basis.

June Structural Sales at 66 Per Cent

WASHINGTON, June 18.—Sales of fabricated structural steel during June amounted to 66 per cent of shop capacity as against 81 per cent in May, according to reports made to the Department of Commerce by firms representing 75 per cent of the fabricated capacity of the United States. On the basis of the percentage of sales to capacity, the total sales throughout the United States would amount to 119,000 tons in June as against 146,200 tons in May and 155,340 tons in April.

Reports from 96 identical firms, with an aggregate capacity of 135,050 tons, showed the following actual sales for past three months: April, 118,911 tons; May, 109,263 tons; June, 89,974 tons. The percentage of the actual tonnage booked by firms reporting compared to their capacity for three months was as follows: April 88 per cent, May 80.9 per cent, June 66.6 per cent.

The six months business of 1922 totals upward of 710,000 tons, or nearly two-thirds fabricating capacity. The first half year contracting was greater in 1916 and 1920, but the rate as applied to a whole year was exceeded in the last decade in only 1915 and 1916. June, 1922, showed the largest total of any June for which there are records except June, 1915, in which there was a volume of 138,000 tons. The June average for the preceding decade is 95,650 tons.

Railroad Equipment Business

A feature of the week was the placing of large orders for repairs to locomotives and freight cars.

The Baltimore & Ohio divided orders for repairs to 6000 cars and 40 locomotives. The cars were divided as follows: Koppel Car Repair Co., American Car & Foundry Co., Standard Steel Car Co. and the Pullman Co., each 1000; Youngstown Steel Car Co., Hamilton Car Co., General American Car Co. and Illinois Car & Equipment Co., each 500.

The B. & O. locomotive repairs were awarded to Baldwin Locomotive Works, which has also contracted to repair 100 engines for the Erie, 50 for the New York Central and 30 for the New York, New Haven & Hartford.

The Baldwin Works has also taken orders for 50 new locomotives for the Baltimore & Ohio and 25 for the Philadelphia & Reading.

The Norfolk & Western Railroad has ordered 1000 box cars from the Ralston Steel Car Co.

The Buffalo Creek & Gauley Railroad (owned by the Elk River Coal & Lumber Co.) has bought 300 all-steel hopper cars from the American Car & Foundry Co.

The Nashville, Chattanooga & St. Louis has ordered 750 box cars, 150 stock cars and 100 flat cars from the American Car & Foundry Co.; also 15 passenger cars from the same company.

The Illinois Central has let 600 cars for repairs to the Ryan Car Co.

The New York Central has let contracts for an indefinite number of cars for repairs, upward of 1000.

The Chicago, Indianapolis & Louisville is inquiring for 300 composite gondola cars.

FABRICATED STEEL BUSINESS

Bridge and Building Awards and Tonnages Pending at Leading Centers

Awards for fabricated steel work for the past week include the following:

Office building for Westinghouse Electric & Mfg. Co., Thirtieth and Walnut streets, Philadelphia, 300 tons, to Bethlehem Steel Bridge Corporation.

Citizens' Hotel, Charlotte, N. C., 1000 tons, to Southern Engineering Co., Charlotte, N. C.

Public Service Corporation power station at Newark, N. J., 2000 tons, to New York Shipbuilding Corporation.

Building for Chamber of Commerce of the United States, Washington, D. C., 2000 tons, to American Bridge Co.

Shops for Long Island Railroad at Long Island City, N. Y., 400 tons, to Shoemaker-Satterthwait Bridge Co.

Bridge over the Susquehanna River in Lycoming County, Pennsylvania, 1100 tons, to Bethlehem Steel Bridge Corporation.

School No. 188, New York, 700 tons, to Bethlehem Fabricators, Inc.

State highway bridge, No. 3688, War Road, Minn., Guaranty Construction Co., general contractor, 130 tons, to American Bridge Co.

Warehouse for Appleton Coated Paper Co., Appleton, Wis., 100 tons, to Northern Boiler & Structural Iron Works.

Building for Aluminum Goods Mfg. Co., Manitowoc, Wis., 300 tons, let by Walter W. Oeflein, Inc., to Wisconsin Bridge & Iron Co.

Truxillo Railroad Co. of New York for a number of buildings for Honduras, 700 tons, to Bancroft-Jones Corporation, Buffalo, N. Y.

Transmission towers for Blackstone Valley Gas & Electric Co., 650 tons, to Bancroft-Jones Corporation.

Danville, Ill., high school, 300 tons, to Central States Bridge Co.

Tomlinson, Conn., bridge, 1300 tons, to Phoenix Bridge Co.

City of Boston, transit department, 172 tons, to Bethlehem Steel Bridge Corporation.

Euclid-Seventy Ninth Street Building, Cleveland, 470 tons, to the VanDorn Iron Works Co.

Structural Projects Pending

Inquiries for fabricated steel work which may be added to lists of pending projects include the following:

Telephone building on East Thirty-sixth Street, New York, 2000 tons.

New York Edison Co., sub-station, New York, 400 tons.

Material for repair of Queensboro bridge plaza, New York, 500 tons.

Interborough Rapid Transit Co., New York, sub-station, 500 tons.

Museum of Natural History, New York, addition, 700 tons.

Convent of the Sacred Heart, Philadelphia, 500 tons.

United Lutheran publishing building, Thirteenth and Spruce streets, Philadelphia, 1000 tons; bids close July 21.

Reformed Church building at Fifteenth and Race streets, Philadelphia, 1000 tons.

Wire mill, rod mill and train shed for Western Electric Co., 1300 tons, bids close July 21.

Freight depot, Union Pacific Railroad, Denver, Colo.

Bridge work for Cincinnati Northern Railroad, 250 tons. Mount Vernon Bridge Co. low bidder.

Viaduct for a West Virginia coal company, 100 tons; American Bridge Co. low bidder.

Dam No. 44, Ohio River, 650 tons; bids close July 17.

River work near Vicksburg, Miss., 600 tons; bids close July 26.

Roosevelt Hospital building, Dayton, Ohio, 200 tons; bids in.

State Pier, Portland, Me., 900 tons.

Michigan-Lafayette Building, Detroit, 2000 tons, bids taken.

Lima Locomotive Works, Lima, Ohio, plant addition, 2000 tons, bids taken.

Detroit baseball grandstand, 550 tons, bids taken.

St. Clair-Doan Co., Cleveland, theater and other buildings, 250 tons.

County administration buildings, Wanta, N. Y., 500 tons.

Pittsburgh Iron and Steel Market

(*Continued from page* 171)

are likely. The American Sheet & Tin Plate Co. continues to quote on the basis of 3.15c. for black and 4.15c. for galvanized, but has practically no tonnage to spare this side of October. Some independent mills are quoting from $5 to $7 per ton advance over the above price, but to certain favored customers are quoting the same prices as the leading interest. Prices on sheets are given on page 183.

Old Material.—Hardly enough scrap of any kind is being sold in the local market to determine prices. Dealers say that consumers are specifying on contracts and taking in the scrap promptly, but are not in the market to buy more, preferring to await the outcome of the coal and railroad strikes. There is a scarcity in the supply of cast iron borings, and also in several grades of steel-making scrap. Heavy melting scrap sold at Youngstown last week at $18.25 to $18.50, but the local market is considerably lower. Cast scrap for open-hearth use is very dull and prices are purely nominal. Not much change in the local scrap market is likely, or is looked for until something definite occurs in the coal or the railroad strikes. In the absence of sales, we make no change in our scrap prices as quoted last week, except a slight reduction on heavy melting scrap.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows per gross ton:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh	$17.25
No. 1 cast, cupola size	$19.00 to 20.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	17.00 to 17.50
Compressed sheet steel	15.50 to 16.00
Bundled sheets, sides and ends	14.50 to 15.00
Railroad knuckles and couplers	18.50 to 19.00
Railroad coil and leaf springs	18.50 to 19.00
Low phosphorus standard bloom and billet ends	20.00 to 21.00
Low phosphorus plates and other grades	19.00 to 20.00
Railroad malleable	16.50 to 17.00
Iron car axles	26.00 to 27.00
Locomotive axles, steel	24.00 to 25.00
Steel car axles	17.50 to 18.00
Cast iron wheels	18.50 to 19.00
Rolled steel wheels	18.50 to 19.00
Machine shop turnings	14.00 to 14.50
Sheet bar crop ends	18.50 to 19.00
Heavy steel axle turnings	15.50 to 16.00
Short shoveling turnings	15.00 to 15.50
Heavy breakable cast	18.00 to 18.50
Stove plate	15.00 to 15.50
Cast iron borings	16.00 to 16.50
No. 1 railroad wrought	15.00 to 15.50

Prepaying Duties on Advertising Matter

For the information of those concerned there is reprinted from the Commerce Reports of the Department of Commerce a dispatch from the American consul at Adelaide, reading in part as follows:

"Manufacturers who go to the trouble to issue expensive catalogs and price lists often suffer a very serious disadvantage when such packages arrive addressed to Australian business men, who find that they are required to pay duty and short postage. In many cases, if he had previously been inclined to purchase in the United States the line represented by the catalog, its receipt in this manner offends him to such an extent that he refuses to give further consideration to any line that that particular manufacturer has to offer. It is therefore advisable to warn American business houses to make certain that the duty is fully prepaid and that packages bear the full amount of postage required. It should also be borne in mind that short postage which has to be paid at the other end is levied at double the regular rate."

An ore transfer car of approximately as much as 150 tons capacity is to be built for the Cambria Steel Co. by the Atlas Car & Mfg. Co.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Plates

Sheared, tank quality, base, per lb.....1.70c. to 1.80c.

Structural Material

Beams, channels, etc.....1.70c. to 1.80c.

Iron and Steel Bars

Soft steel bars, base, per lb.....1.70c. to 1.80c.
Refined iron bars, base per lb.....2.20c.

Hot-Rolled Flats

Hoops, base, per lb.....2.50c. to 2.75c.
Bands, base, per lb.....2.50c. to 2.75c.
Strips, base, per lb.....2.50c. to 2.75c.
Cotton ties, per bundle of 45 lb.....$1.10

Cold-Finished Steels

Bars and shafting, base, per lb.....2.10c.
Strips, base, per lb.....4.00c.

Wire Products

Nails, base, per keg..... $2.40
Bright plain wire, base, per 100 lb..... 2.25
Annealed fence wire, base, per 100 lb..... 2.25
Galvanized wire, base, per 100 lb..... 2.75
Galvanized barbed, base, per 100 lb..... 3.05 to 3.15
Galvanized staples, base, per keg..... 3.05 to 3.15
Painted barbed wire, base, per 100 lb..... 2.55 to 2.65
Polished staples, base per keg..... 2.55 to 2.65
Cement coated nails, base, per count keg..... 1.90 to 2.00
Woven fence, carloads.....73 per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads,
60, 10 and 10 per cent off list
Machine bolts, small, cut threads....60 and 10 per cent off list
Machine bolts, larger and longer.....60 and 10 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads.60 and 10 per cent off list
Cut threads .....60 per cent off list
Longer and larger sizes .....60 per cent off list
Lag bolts .....60, 10 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.:
Smaller and shorter .....50 and 10 per cent off list
Larger and longer sizes.....50 and 10 per cent off list
Hot pressed square or hex. blank nuts.....$4.50 off list
Hot pressed nuts, tapped .....$4.50 off list
C.p.c. and t. sq. or hex. nuts, blank.....$4.50 off list
C.p.c. and t. sq. or hex. nuts, tapped.....$4.50 off list
Semi-finished hex. nuts:
9/16 in. and smaller, U. S. S.....80 and10 per cent off list
⅝ in. and larger, U. S. S...75 and 10 and 10 per cent off list
Small sizes, S. A. E.....80, 10 and 10 per cent off list
S. A. E. ⅝ in. and larger...75 and 10 and 10 per cent off list
Stove bolts in packages.....80 and 5 per cent off list
Stove bolts in bulk.....80, 5 and 2½ per cent off list
Tire bolts .....65 per cent off list
Track bolts in carloads.....3.00c. to 3.25c. base
Track bolts, less than 200 kegs.....3.50c. to 3.75c. base

Cap and Set Screws

Milled square and hex. head cap screws,
75 and 10 per cent off list
Milled set screws.....75 per cent off list
Upset cap screws.....80 per cent off list
Upset set screws.....80 and 5 per cent off list

Rivets

Large structural and ship rivets, base per 100 lb.....$2.40
Large boiler rivets, base per 100 lb..... 2.50
Small rivets .....70 and 5 to 70 and 10 per cent off list

Track Equipment

Spikes, 9/16 in. and larger, base, per 100 lb....$2.25 to $2.35
Spikes, ½ in. and smaller, base, per 100 lb..... 2.50 to 2.60
Spikes, boat and barge, base, per 100 lb..... 2.50 to 2.60
Track bolts, base, per 100 lb..... 3.25
Tie plates, per 100 lb..... 2.00 to 2.25
Angle bars, base, per 100 lb..... 2.40

Welded Pipe

Butt Weld

Steel Inches	Black	Galv.	*Iron* Inches	Black	Galv.
⅛	54½	28	¼ to ⅜	+ 3½	+22½
¼ to ⅜	60	33½	½	36½	18½
½	65	50½	¾	42½	27½
¾	69	56½	1 to 1½	44½	29½
1 to 3	71	58½			

Lap Weld

2	64	51½	2	39½	25½
2½ to 6	68	55½	2½ to 6	42½	29½
7 to 8	65	51½	7 to 12	40½	27½
9 to 12	64	50½			

Butt Weld, extra strong, plain ends

⅛	50½	33	¼ to ⅜	+ 4½	+37½
¼ to ⅜	56	38½	½	35½	23½
½	62	50½	¾	42½	28½
¾	67	55½	1 to 1½	44½	30½
1 to 1½	69	57½			
2 to 3	70	58½			

Lap Weld, extra strong, plain ends

2	62	50½	2	40½	27½
2½ to 4	66	54½	2½ to 4	43½	31½
4½ to 6	65	53½	4½ to 6	42½	30½
7 to 8	61	47½	7 to 8	35½	23½
9 to 12	55	41½	9 to 12	30½	18½

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 and 2½ per cent.

Boiler Tubes

Lap Welded Steel		*Charcoal Iron*	
1¾ in.	26½	1½ in.	5
2 to 2¼ in.	41	1¾ to 1⅞ in.	15
2½ to 3 in.	52	2 to 2¼ in.	25
3¼ to 13 in.	57	2½ to 3 in.	30
		3¼ to 4½ in.	32

To large buyers of steel tubes a supplementary discount of 5 per cent is allowed.

Standard Commercial Seamless Boiler Tubes

Discounts on cold-drawn or hot-rolled tubes in carload lots, f.o.b. Pittsburgh, follow:

1 in.	60	2½ and 2¾ in.	43
1¼ and 1½ in.	52	3 in.	47
1¾ in.	36	3¼ to 4 in.	52
2 and 2¼ in.	39	4¼ in. to 5 in.	44

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Tin Plate

Standard cokes, per base box.....$4.75

Terne Plate

(Per package, 200-lb.)

8-lb. coating	$9.30	25-lb. coating I. C.....$14.25	
8-lb. coating I. C.....	9.60	30-lb. coating I. C.....	15.25
15-lb. coating I. C.....	11.80	35-lb. coating I. C.....	16.25
20-lb. coating I. C.....	13.00	40-lb. coating I. C.....	17.25

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....2.40c. to 2.60c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.15c. to 3.40c.

Galvanized

No. 28 (base), per lb.....4.15c. to 4.40c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.15c. to 3.40c.

Manufacturers have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic.	$0.325	Buffalo	$0.265	St. Louis	0.43
Philadelphia, export...	0.265	Cleveland	0.215	Kansas City	$0.735
Baltimore, domestic...	0.315	Cleveland, Youngstown		Kansas City (pipe)...	0.705
Baltimore, export....	0.255	Comb.	0.19	St. Paul	0.595
New York, domestic...	0.34	Detroit	0.295	Omaha	0.735
New York, export.....	0.285	Cincinnati	0.295	Omaha (pipe)	0.705
Boston, domestic	0.365	Indianapolis	0.31	Denver	1.275
Boston, export	0.285	Chicago	0.34	Denver (pipe)	1.215

Pacific Coast	$1.50
Pac. Coast, ship plates	1.20
Birmingham	0.69
Memphis	0.385
Jacksonville, all rail..	0.50
Jacksonville, rail and water	0.415
New Orleans	0.515

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 30c. to 40c.; ship plates, 30c. to 40c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 30c. to 40c.; sheets and tin plates, 50c.; rods, wire rope, cable and strands, 75c.; wire fencing, netting and stretcher, 50c.; pipe, not over 8 in. in diameter, 50c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

GERMAN PRICES AGAIN RISE

Steel Prices Increased 1000 m. to Offset 400 m. Increase in Coal—Austria Undersells Germany

(*Special Correspondence*)

BERLIN, GERMANY, July 4.—When prices for semi-finished material were increased on June 20, they were based on the price of coal fixed by the Federal Coal Board on April 20, and were to remain in force until the end of July. It was stated, however, that for every 100 m. increase in the price of bituminous coal rolled material would be automatically increased 275 m. The negotiations in Berlin on miners' wages have led to an increase of about 31 per cent, which works out to 65 m. per shift increase. Bituminous coal rises from 909.50 m. ($2) per ton to 1208 m. ($2.68) and Rhenish lignite is 180 to 735 m. ($0.40 to $1.62) per ton higher. The miners' union originally asked for an increase of 35 m. to counterbalance depreciation in the purchasing power of the mark, but it was realized that unless a substantial inducement was offered, large numbers would leave the mines to take up work in industries paying higher wages. Reparations coal is drawing heavily on German coal production, and the present output could not be maintained if the ranks of the colliers were further depleted. The increase in coal prices raises rolled material by about 1000 m. ($2.20) per metric ton. Guiding prices for basic material are now as follows per metric ton:

	Marks	
Ingots	8,520	$18.74
Blooms	9,320	20.50
Billets	9,660	21.25
Sheet bars	9,910	21.80
Structural shapes	11,290	24.84
Bar iron shapes	11,470	25.23
Universal iron	12,470	27.43
Hoop iron	13,030	28.67
Wire rods	12,340	27.15
Sheets		
No. 6 and heavier	12,860	28.29
Nos. 6 to 11	14,610	32.14
Nos. 11 to 20	15,710	34.56
No. 20 and lighter	16,490	36.28

The surcharge for open hearth material is unaltered at 900 m. ($1.98) per ton. The increase still leaves a margin between German and foreign prices, which is, however, further reduced by the export duty of 4 per cent and the tax on turnover of 2 per cent.

Through the recent depreciation of German currency British coal is again considerably higher than the home product but because of the coal shortage large quantities are still being imported. The Pig Iron Association lately offered 8000 tons of iron which was produced with British coal. The price was 800 m. higher than the iron produced with German coal. The association now announces the sale of another 16,000 tons with a surcharge of 500 m. per ton. Pig iron has been increased about 1000 m. per metric ton. The following table shows the prices, now in effect, in marks per metric ton:

	Marks	
Hematite	7,670	$16.87
Foundry Iron		
No. 1	7,261	15.97
No. 2	7,191	15.82
Luxemburg	6,431	14.15
Steel making, low in copper	7,250	15.95
Siegerland, steel making	7,250	15.95
Malleable pig iron	7,590	16.70
Ferromanganese, 80 per cent	16,570	36.45
Spiegeleisen, 8 to 10 per cent	8,239	18.12
Ferrosilicon, 10 per cent	9,050	19.91

These prices are in force until further notice. The Pig Iron Association is allowing a rebate of 100 m. ($0.22) per ton. The increase is made because of the 25 per cent rise in freight rates, wage increases and higher costs of inland and foreign ore. Scrap iron has gone up lately and is 6,400 m. ($14.08) for cast iron, and 5,400 ($11.88) for wrought iron. Because of the excessive prices it is intended to re-introduce rationing and Government control of scrap. In view of the rise in pig iron foundries are raising prices 15 per cent. Works have plenty of orders.

The Otto Wolff company, which with some of the largest iron and steel interests recently founded the Iron Export Otto Wolff, has acquired a controlling interest in the Archimedes A. G. in Berlin, which manufactures iron and steel products. Archimedes is now increasing its capital from 6,000,000 to 30,000,000 m. Of the increase 16,000,000 will be used to combine with the Wolff company, the Düsseldorfer Eisenhütte A. G., Ratingen, capital 8,000,000 m. the Hildener Schrauben und Metallwerke A. G., capital 4,000,000 m. and R. W. Schulte in Plettenberg and Düsseldorf. These three companies manufacture screws and rivets and their products are to be sold by Wolff, which is beginning to be one of the largest interests in the German iron and steel industry.

The Mannesmann company has established a new tube company in Komotau, Czecho-Slovakia, with a capital of 30,000,000 kronen.

The Society of German Rivet Works in Düsseldorf has raised the price for heavy rivets (boilers, ships, bridge work) from 19,200 to 24,000 m. per ton.

Austrian foundries, which have been obtaining their pig iron largely from Upper Silesia, are now placing large orders in the Saar district and in France, as the Silesian and the West German works cannot supply sufficient quantities. The Austrian mills are very busy as their prices are considerably below the level of the world market and are even undercutting German quotations. Dealers in Austria with stocks of Czecho-Slovakian rolled material are unable to dispose of them because of the lower domestic prices. The situation in the Czecho-Slovakian iron and steel industry has forced 17 of the 22 blast furnaces in the country out of operation.

European and South American Fairs

Throughout the world a good many fairs and exhibitions seem to have been planned. Among them may be mentioned the following:

Hamburg, Germany, July 19 to 24, fair of electrical and other machinery.

Rio de Janeiro, Brazil, Sept. 7, 1922, to March 31, 1923, International Centenary Exhibition.

Santiago, Chile, middle of September to November, Chilean exhibition of national industries.

Breslau, Germany, Sept. 3 to 6, autumn sample fair.

Trieste, Italy, Sept. 3 to 18, general sample fair.

Naples, Italy, Sept. 16 to 30, sample fair.

Laibach, Jugoslavia, Sept. 2 to 11, sample fair.

Vienna, Austria, Sept. 10 to 16, autumn fair.

Lemberg, Poland, Sept. 5 to 15, eastern fair.

Prag, Czechoslovakia, Sept. 3 to 10, international autumn fair.

Frankfort-on-Main, Germany, Oct. 8 to 14, autumn fair.

Lyon, France, Oct. 1 to 15, international autumn sample fair.

Paris, France, Oct. 1 to 16, exhibition of agricultural machinery.

Paris, France, Oct. 4 to 15, international motor-car exhibition.

London, England, Oct. 13 to 23, international exhibition of motor trucks.

London, England, November, international motor exhibition.

Brussels, Belgium, Dec. 3 to 17, international motor car exhibition.

Proposed Reductions on Ore Rates Again Suspended

WASHINGTON, July 18.—The Interstate Commerce Commission yesterday further suspended until Aug. 29, tariffs which proposed a reduction of 20 per cent in ex-lake ore rates and 28 per cent in Eastern ore rates. The further suspension was ordered because the commission has not completed its hearing in these cases. The proposed reductions, which were the object of prolonged hearings during the spring, were strongly supported by the railroads and iron and steel interests, except those in the Buffalo district. Since this case came before the commission, it has made a reduction of 10 per cent in rates on ore as well as other products in its general rate decision, which became effective July 1.

NON-FERROUS METALS

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
July	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
12.....	14.00	13.75	31.00	5.75	5.50	5.95	5.60
13.....	14.00	13.75	30.95	5.75	5.50	6.00	5.65
14.....	14.00	13.75	31.00	5.75	5.50	6.10	5.75
15.....	14.00	13.75	.....	5.75	5.50	6.10	5.75
17.....	14.00	13.75	31.12½	5.75	5.50	6.10	5.75
18.....	14.00	13.75	31.50	5.75	5.50	6.10	5.75

*Refinery quotation.

New York

NEW YORK, July 18.

Copper.—A fairly well sustained demand, together with the fact that there is no surplus of copper, contributed to the continued strength of prices. Usually July is marked by weakness in prices, but the situation this year is different. Sales have been made during the past week for delivery up to the end of the year at 14c., delivered, for electrolytic, and while this price has been shaded on a few sales the price has not gone below 13.95c. Sales for export have also been made at 13.95c. and 14c., f.a.s. There is no large volume of business and buyers are disposed to be somewhat cautious, but are ready to buy for prompt shipment the copper that is available. However, there is little copper to be had from second hands.

Tin.—Up to Thursday the tin market was dull last week. There were sellers but no buyers. On Thursday there was a slight change for the better, a little business, possibly 100 to 150 tons, being done at 30.87½c. to 31c. Sales were made from steamers at dock and to arrive. On Friday about 100 tons was sold at 30.87½c. to 31c., while on Monday about 200 tons was sold, mostly for July-August delivery, but including August-September from the East, at 31.25c. to 31.50c. The market to-day was firm at 31.50c. London cables to-day report spot standard quoted there at £155 2s. 6d.; future standard, £155 12s. 6d.; spot straits, £156 12s. 6d.; Singapore price £156 15s.

Lead.—The market is quiet and dull and prices are stationary, 5.50c., St. Louis, and 5.75c., New York. It is reported that some transactions at St. Louis have been put through at 5.45c.

Zinc.—Publication of zinc statistics by the American Zinc Institute during the week greatly strengthened the market; at any rate the strength occurred simultaneously with the announcement of these figures, hence it is fair to assume that the better statistical position of this metal was responsible for the upturn in prices. The report stated the stocks on hand as of July 1 totaled 29,576 tons, a decline of about 11,000 tons from the June 1 figures. Shipments in June were 39,380 tons, so that the amount on hand July 1 was less than one month's supply. Prices for prompt shipment stiffened about the middle of last week, and the quotations for several days have been 5.75c., St. Louis, or 6.10c., New York.

Old Metals.—Prices are a little higher and business more active. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	13.50
Copper, heavy and wire	12.75
Copper, light and bottoms	11.00
Heavy machine composition	10.50
Brass, heavy	8.00
Brass, light	6.50
No. 1 red brass or composition turnings	8.75
No. 1 yellow rod brass turnings	7.50
Lead, heavy	4.875
Lead, tea	3.75
Zinc	3.25

Aluminum.—The Aluminum Co. of America continued to quote virgin metal, 98-99 per cent pure, in lots of 15 tons or more, f.o.b. shipping point, carload rate of freight allowed, at 19.10c. The same grade of imported metal is quoted at 17.75c. to 18c., duty paid, New York.

Antimony.—The market is quiet and unchanged, prompt carloads being quoted at 5c. per lb. or a shade under, duty paid, New York.

Chicago

July 18.—Copper and spelter have advanced, but tin and lead are easier. Some fairly sizable inquiries are pending in spelter, but actual business is light and the market is dull. On other metals prices are unchanged except for a slight advance in copper bottoms. We quote, in carload lots, Lake copper, 14.12½c.; tin, 32c.; lead, 5.50c.; spelter, 5.75c.; antimony, 7c., in less than carload lots. On old metals we quote: Copper wire, crucible shapes and copper clips, 10.75c.; copper bottoms, 9c.; red brass, 8.50c.; yellow brass, 6.75c.; lead pipe, 14.25c.; zinc, 2.75c.; pewter, No. 1, 20c.; tin foil, 22.50c.; block tin, 26c.; all buying prices for less than carload lots.

St. Louis

July 18.—We quote lead in carload lots at 5.40c. to 5.50c.; slab zinc, 5.73c. to 5.80c. On old metals we quote light brass, 3.50c.; heavy red brass and light copper, 7c.; heavy yellow brass, 4c.; heavy copper and copper wire, 7.50c.; zinc, 2c.; lead, 3c.; pewter, 15c.; tin foil, 16c.; tea lead, 2c.; and aluminum, 9c.

Effect of Manganese on the Magnetic Properties of Steel

It has been recognized for some time that manganese has an effect on the magnetic properties of steel which is of a somewhat similar nature to that of carbon. A series of iron-carbon-manganese alloys of exceptional purity have become available for a study at the Bureau of Standards of their magnetic properties. Several sets of specimens, each set having the same carbon content, but varying manganese, will be subjected to standard heat treatment and their magnetic properties determined. New apparatus for the testing of small specimens recently developed at the bureau is being used in this investigation.

Attorney General Will Soon Report on Mergers

WASHINGTON, July 18.—Attorney General Daugherty said this afternoon that he expected to send the report of the Department of Justice regarding the investigation of proposed mergers of independent steel companies to the Senate some time this week. He stated that the draft of the report practically has been completed and but little remains to be done before it is ready to be submitted to the Senate. The Department of Justice investigation was under the Sherman anti-trust act while the investigation of the Federal Trade Commission is under the Clayton act. Both investigations were ordered by a resolution of Senator La Follette. Meanwhile the Federal Trade Commission is continuing its investigation without any indication as to when it will be completed. Its complaint against the Bethlehem Steel Co. and the Lackawanna Steel Co. was followed by the issuance of a questionnaire to all the steel companies of the country bearing on production, domestic and foreign shipments, capitalization, etc. This questionnaire has been responded to by many companies, including the United States Steel Corporation.

As yet nothing has been done to indicate what action will be taken with regard to the proposed merger of the Midvale Steel & Ordnance Co., the Republic Iron & Steel Co. and the Inland Steel Co. To-morrow counsel for these three companies will hold a conference with the Federal Trade Commission at which, it is said, explanation of data submitted by these companies will be made.

June sales of the Metropolitan Paving Brick Co., Canton, Ohio, reached 3000 carloads, establishing a new monthly record. Officials report sustained demand for road building and construction. The company operates properties at Bessemer, Pa., and in the vicinity of Canton.

PERSONAL

Frederick R. Sites has been appointed private secretary of Judge Elbert H. Gary, chairman United States Steel Corporation, succeeding George K. Leet, who, after serving as private secretary for 11 years was elected secretary of the Steel Corporation last April. Mr. Sites graduated from the Massachusetts Institute of Technology in 1899. He served for about a year in a minor capacity at the Central blast furnaces of the American Steel & Wire Co., Cleveland, and later for about a year in the metallurgical department of the Carnegie Steel Co., Homestead, Pa. Nine years ago he became connected with the United States Steel Products Co. and has just returned from Shanghai, China, where he has been manager in China for that company. During a part of the years 1918-19, Mr. Sites was treasurer of the Federal Shipbuilding Co., but returned to China when the export business became active after the war. Judge Gary became well acquainted with Mr. Sites while making a tour of the Far East six years ago. Mr. Leet, who has been serving as private secretary to Judge Gary as well as secretary of the Steel Corporation since his election to the latter position, will now devote his entire time to the position of secretary of the Steel Corporation.

Roy H. Davis, general manager Firth-Sterling Steel Co., McKeesport, Pa., whose paper on "Brands vs. Analysis in Buying Tool Steel," read at the convention of the National Association of Purchasing Agents, Rochester, N. Y., May 17, has aroused much interest among buyers of tool steel, was born in 1885 and after 6 months' work at the University of Oregon, entered the United States Naval Academy in 1905, graduating four years later. His time in the service, 1909-13, was spent at sea and in ordnance and metallurgical work at the various steel companies which were undertaking that work. In the latter part of 1913, he became connected with the United States Coal & Coke Co., Gary, W. Va., serving as mechanical engineer and superintendent of power and electrical engineer. In 1915 he became associated with L. J. Firth in the office of the Washington Steel & Ordnance Co., New York, as assistant to W. A. Burton. Since 1917 he has been at the McKeesport plant of the Firth-Sterling Steel Co. with the exception of several months spent in Sheffield, England.

ROY H. DAVIS

Eugene G. Grace, president Bethlehem Steel Corporation, sailed on the Olympic, July 15, for a European trip of several weeks.

Walter W. Leck, formerly general superintendent American Tube & Stamping Co., Bridgeport, Conn., and later superintendent of rolling mills, Steelton plant, Bethlehem Steel Co., has resigned to become general superintendent, Scullin Steel Co., St. Louis.

William F. Figee, formerly with Laughlin & Barney Machinery Co., Pittsburgh, is now connected with the sales department of Chas. A. Schieren Co., in its office in the Maloney building, Pittsburgh.

James A. McCrory, formerly secretary and general manager of sales American Steel Co., Park Building, Pittsburgh, has resigned, effective July 15. After a vacation, Mr. McCrory plans to engage in business on his own account.

Julius Kahn, president Truscon Steel Co., Youngstown, Ohio, sailed last Saturday on the Vroonland for an extended tour of Europe.

Arthur Hungerford Pullen, chairman Burton-Griffiths Co., Ltd., London, Eng., importer of machinery, spent several days in Milwaukee on a business mission with local manufacturers. The Milwaukee Association of Commerce arranged a special luncheon at the Athletic Club in his honor at which Mr. Pullen briefly discussed exporting and importing problems under present-day conditions.

W. S. Stothoff has resigned as works manager of the Hadfield-Penfield Steel Co., Bucyrus, Ohio, and will engage in other business in the East. He has been succeeded by R. O. Perrott, secretary of the company and resident manager of the Bucyrus plants who has become manager of all the plants, the others being located in Mansfield and Willoughby, Ohio. Arthur Whitcraft has become manager of the company's steel foundry in Bucyrus.

Albert E. Newton has been chosen general manager of the Collins Co., manufacturer of tools, Collinsville, Conn. Mr. Newton was for many years with the Reed-Prentice Co., Worcester, Mass.

J. S. Black has been made works manager of the Corbin Screw division of the American Hardware Corporation, New Britain, Conn., succeeding Roswell Sorrow, who recently resigned. Mr. Black was formerly associated with the New Britain Machine Co., New Britain, Conn.

Frank H. Willard has been elected vice-president and general manager Graton & Knight Mfg. Co., Worcester, Mass., belting. At the time of the reorganization of the company a few months ago, Mr. Willard resigned as vice-president and director, but remained with the company.

Henry C. Graton, founder of Graton & Knight Mfg. Co., Worcester, Mass., belting, last week celebrated his ninety-second birthday. He and Joseph A. Knight formed a partnership in 1861.

R. M. Connell, Kansas City, Mo., has been appointed trade commissioner for Sao Paulo and southern Brazil, and will leave Washington on July 20 to take up his new work. For the past year Mr. Connell was in Mexico City as assistant trade commissioner, and for several months he was in charge of the office of the commercial attaché at that post.

E. B. Phillips, of Jacksonville, Fla., has been appointed instructor in electrical engineering at Carnegie Institute of Technology, Pittsburgh. He will join the staff of the college of engineering on Sept. 1. Mr. Phillips has had teaching and practical experience. He is a graduate of Georgia Institute of Technology, class of 1917, and for two years following was an electrical engineer with the Western Electric Co., New York. During the past two years, Mr. Phillips has been instructor in electrical engineering at the United States Naval Academy, Annapolis, and at Georgia Tech.

An important change in the Department of Electrical Engineering at the Carnegie Institute of Technology next year will be the retirement of Prof. A. J. Wurtz from the staff of the department. Beginning next fall, he will devote all of his time to research work in electrical engineering for the division of co-operative research, continuing research work he has been doing on a part-time basis in the college of engineering. The acquisition of Professor Wurtz to the Research division is of particular interest to electrical engineering companies, because of his contributions to the development of electrical engineering. He is the discoverer of the five non-arcing metals, and has made many notable inventions during his career.

Frank L. Estep, junior partner of the firm of C. P. Perin and S. M. Marshall, consulting engineers, New York, whose sailing for India on July 18 was mentioned in this column in last week's issue, plans to remain a few weeks in England in connection with engineering work for the Tinplate Co. of India. In India he will supervise the completion of construction and the starting up of the plant. He will also represent his firm while in India in connection with work being done for the Tata Iron & Steel Co., the Mysore Distillation &

Iron Works, the Indian Steel Wire Products Co., the Agricultural Implements Co., Ltd., and other enterprises.

Howard F. Deverell, vice-president and director the Otis Steel Co., Cleveland, retired on June 30, terminating a career of 28 years of active service in that organization. Mr. Deverell's first connection with the Otis Steel Co. was in the capacity of clerk in the Chicago office in April, 1894. Two years later, he took charge of the Chicago office as district sales representative. With the closing of the office in that district, he was transferred to the main office in 1898. A few years later he was made secretary of the firm, then known as Otis Steel Co., Ltd. When the Otis Steel Co. of Ohio was formed in 1912 to supplant the Otis Steel Co., Ltd., Mr. Deverell was elected secretary and director. He assumed his duties as vice-president in 1919, in which capacity he exercised general supervision over sales and attended other executive matters. Mr. Deverell plans to devote his future time to private affairs.

W. C. Perkins was transferred on July 15 to the Pittsburgh office as district sales manager of the American Chain Co., Inc., Bridgeport, Conn. At the same time the headquarters of the Southern district office were moved to Pittsburgh, combining with the Pittsburgh organization.

Elbert H. Gary, chairman United States Steel Corporation, expects to start about Aug. 1 on a vacation to be spent in the Rocky Mountains.

OBITUARY

WILLIAM T. MURPHY, president, Standard Machinery Co., Auburn, R. I., died at Greenfield, Mass., July 9, following a three days illness. Mr. Murphy was born in Providence 40 years ago, and graduated from Brown University in 1903. A few months later he became associated with the late Michael J. Houlihan in the construction of machinery, and eventually the machine company of which he was the head was established. He had served as a member of the State Board of Labor, as president of the Metal Trades Council, and for years was an active member of the Providence Chamber of Commerce.

HARRY R. SIDNELL, superintendent of the F. A. Colman Co., Cleveland, manufacturer of foundry equipment, died July 11, age 61 years.

BURTON CLIFTON BANGS, vice-president and purchasing agent Leavitt Machine Co., Orange, Mass., died July 13, at his home in that town after a ten-weeks' illness, age 70.

CHARLES E. THWING, former president Worcester Lathe Co., Worcester, Mass., died last week at his home in that city after a five-weeks' illness, in his sixty-first year. Mr. Thwing retired from business about five years ago.

ALFRED DAWES, Winchester, Mass., inventor of machinery for manufacturing rivets, died at his home July 12. Mr. Dawes was born in Richmond, Me., in 1836.

J. HOBART BRONSON, president, Oakville Co., manufacturer of wire and metal goods, of Oakville, Conn., died at his summer home in the Berkshire Mountains, at Litchfield, Conn., Thursday morning, July 6, after an illness of but two days. Mr. Bronson, who was 80 years old, was a prominent industrial figure in Connecticut.

The projected symposium on electro-osmosis intended for the Montreal meeting of the American Electro-Chemical Society has been abandoned owing to the inability of a number of members who were relied on to prepare papers at this time. It has, therefore, been decided to abandon the symposium so far as the fall meeting is concerned.

Refractories Prices Irregular

PITTSBURGH, July 17.—The recent advance of $2 per 1000 in prices of fire clay brick does not yet appear to be fully established. A few makers of high duty brick still are accepting business at $32, and since these makers are among the largest producers, the effort of others to obtain $34 is meeting with little success. A good many users were permitted to cover their immediate requirements at the old prices and this also is a hindrance to the establishment of the higher prices. The advances in silica brick and in magnesite and chrome brick are well held. Obligations of the makers of fire clay and silica brick are rather heavy and not a few of them are falling behind their orders because of inability to obtain a sufficient supply of labor. Some manufacturers have been obliged to raise wages to maintain their organizations, and if coal miners have present wage scales preserved still further advances in clay mine and brick plant wage scales may be necessary to narrow the gap, now unusually wide, between the two classes of labor.

We quote per 1000 f.o.b. works:

Fire Clay	High Duty	Moderate Duty
Pennsylvania	$32.00 to $36.00	$28.00 to $34.00
Ohio	32.00 to 34.00	28.00 to 32.00
Kentucky	32.00 to 37.00	28.00 to 34.00
Illinois	34.00 to 36.00	32.00 to 34.00
Missouri	34.00 to 36.00	30.00 to 34.00
Silica Brick		
Pennsylvania		33.00 to 35.00
Chicago		41.00
Birmingham		40.00
Standard size per net ton (f.o.b. Baltimore and Chester, Pa.)		56.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)		30.00
Chrome Brick		
Standard size, per net ton		42.00

Black Sheets Easier in Valleys

YOUNGSTOWN, July 17.—In the sheet market, black sheets have been purchasable either out of stock or from new rollings at the 3.15c. basis, with deliveries possible in three to four weeks. Higher prices applied only on the smaller percentage of shipments, as indicated by the $2.90 average on Nos. 26, 27 and 28 gage black sheets on May-June shipments.

Galvanized has been more difficult to obtain on prompt shipment, however, due more to inadequacy of pickling capacity than shortage of black sheets. Full finished sheets have been in urgent demand and because a greater profit is realized on them as compared with galvanized grades, they have been accorded preferment in pickling departments.

Certain independents have been quoting up to 4.85c. on full finished stock, base gage, which compares with the nominal 4.75c. market and the 4.50c. quotation of the leading interest.

The pipe situation is characterized as very firm, especially with regard to buttweld sizes, with some makers committed 90 days ahead. This, coupled with sheet demand, reflects activity in new construction.

Makers of merchant bars have been falling behind on their obligations, and current interruptions to production will produce still more of a stringency in this market. Prices are trending to a 1.80c. minimum.

Valley Scrap Market

YOUNGSTOWN, July 17.—Higher scrap prices will immediately follow any enlarged demand in wake of curtailed iron output. The market in the Valley has been ranging from $18.50 to $19 for heavy melting.

Russell E. Gardner, president, Gardner Motor Car Co., St. Louis, announces that sales and production for the first six months of 1922 were 50 per cent greater than they were for the entire year of 1921, that orders on hand for July exceed those of any month since the company began business and that orders already received for August are in excess for those for July. The plant here now has an average of output of 85 cars a day, and when the supply of bodies, in which there has been a shortage, becomes more easily available the production will be increased to 100 cars daily.

PROSPEROUS INDUSTRIES

National Industrial Conference Board Survey of Conditions

In surveying industrial conditions, the National Industrial Conference Board says:

"The week has been tense with labor difficulties. Though some of the striking railroad shop men have returned to avoid loss of seniority and other privileges, and a strike of maintenance of way men has so far been held off, a small number of stationary firemen, engineers and oilers have joined the strike and the roads are having difficulty in maintaining service. Efforts of the Railway Labor Board at conciliation have not been successful, though the question of restoration of seniority rights is reported to be the chief obstacle to agreement. The Administration is hopeful of a settlement, but the Government, according to a presidential proclamation, has ready all necessary measures to check any tendency to violence or interruption of mail traffic.

"Bituminous miners and operators having failed to agree in conference, the President has proposed resumption of work under present wage scales until Aug. 10, or until an arbitration board shall have completed a thorough investigation of the industry. Anthracite operators and miners have accepted this proposal, but the bituminous miners offered such strong objection to certain features as to constitute practical rejection of it.

"The clothing trades of New York, Philadelphia and Baltimore are faced with new strike disturbances, but textile workers in New England are reported to be returning. All but four mills in Rhode Island have resumed, though a deadlock persists in the New Hampshire mills, where the employers have refused State arbitration offers.

"Despite the handicap of labor disturbances, industry shows a steady improvement, employment continues to pick up, the demand for labor grows and the number of wage increases still continues to overbalance the number of wage reductions reported. The United States Employment Service reports employment increases in 52 of 65 leading cities, all industries but the stone, clay and glass products showing an increase. The general feeling is that if current railroad and coal problems can be satisfactorily settled, the rate of progress shown in the past month will be satisfactorily maintained and the country will be able to step clear of the depression by the fall. The greatest factors of uncertainty are felt to lie in the labor situation and in the tariff legislation contemplated in Congress.

"Abroad, the signs of more stable industrial readjustment are seen in the continued movement to lengthen working hours. The precarious financial position of Germany remains the outstanding factor in the international situation, the Hague conference having so far failed of noteworthy accomplishment."

Record Construction First Half 1922

Building contracts awarded during June in the 27 northeastern States, according to the F. W. Dodge Co., amounted to $343,440,000. Except for the record figures of April and May of this year, this is larger than any previous monthly total. It is only 5 per cent under the record May figure, and shows a 52 per cent increase over June of last year.

The continued high rate of activity has brought the total amount of construction started in the first six months of this year up to $1,690,984,000, which is by far the highest figure for the first half of any year.

In the six months' record are the following items: $682,663,000 for residential construction; $288,932,000 for public works and utilities; $280,329,000 for business buildings; $164,641,000 for educational buildings, and $123,181,000 for industrial plants, an increase of 42 per cent over the corresponding period of last year.

It seems not unlikely that the remaining summer months may show a slight falling off from the extreme high rate of activity that has prevailed during the second quarter of the year. However, there are localities in the Middle West where the revival has not yet gained the headway that it has in the East. These places may be expected to show increases that will in a measure offset declines elsewhere.

Plant Operations

The Nicholson File Co., Anderson, Ind., is increasing production at its local plant, with working schedule advanced from 45 to 50 hrs. a week.

The Atwater-Kent Co., Philadelphia, manufacturer of ignition equipment, etc., is working at full capacity in all departments of the plant, with an overtime schedule operative in the wireless equipment branches of the works.

The Auto Body Co., Lansing, Mich., is developing maximum capacity output for the manufacture of bodies for the Durant Motor Co.

The Lebanon Iron Co., Duncannon, Pa., has resumed operations at its plant, effective July 10, following a suspension for more than a year. The works will give employment to about 150 men.

The Remy Electric Co., Anderson, Ind., is operating at full capacity with the employment of about 1900 persons. The regular week's shut-down over the Fourth of July, as in former years, was eliminated this year owing to the rush of orders, and just the single day observed.

The John Wood Mfg. Co., Conshohocken, Pa., is running at full capacity at its plant devoted to the manufacture of metal cans for ice cream and kindred service, developing an output of about 4,000 containers daily. The plant was built during the war to manufacture steel containers for the Government, and following converted to commercial production.

The Hess-Bright Mfg. Co., Philadelphia, manufacturer of ball bearings, is working at full capacity, with regular operating force. A shortage of skilled labor for desired additions to the force is reported.

In the Field of Labor

Greater Boston union molders have officially called off their strike and are seeking re-employment. Few of the strikers have been taken back, however, inasmuch as their places previously had been filled.

It developed at a recent meeting in union quarters that drop forgers, who went on strike against the Moore Drop Forging Co., Springfield, Mass., because of the individual contract, more than a year ago, have secured employment at other establishments in that city, as well as in Detroit, Cleveland, Pittsburgh and Plainfield, N. J.

An investigation made by the Massachusetts Associated Industries shows that industries in that State in June operated on an average of 77½ per cent of normal. Production, compared with normal, varied from 50 per cent in the metal working group to 81 to 100 per cent in other industries.

The Supreme Court of Wisconsin has affirmed without opinion a decision of the circuit court which upholds the constitutionality of the provision of the Wisconsin workmen's compensation law, giving the Industrial Commission of Wisconsin authority to impose treble the standard scheduled indemnities on a corporation or other employer, when a minor child working without a child labor permit is injured.

The contract for furnishing and erecting the piping for the north extension of the Windsor, W. Va., power station has been awarded by the West Penn Power Co. to the Pittsburgh Piping & Equipment Co., Pittsburgh, Pa., which was the piping contractor on the original installation as well as on the south extension. Each of the three installations covers two 30,000 kw. units, making a total of 180,000 kw. when the north extension is finished. An interesting feature of the new installation is the steam pressure of 350 lb. per sq. in. with 250 deg. superheat. The Sargol gasketless flanged joint will be used on the steam piping.

Machinery Markets and News of the Works

JULY BUSINESS IS FAIR

Sales This Month Compare Favorably with June Despite Strikes

Automobile Companies Buying, But Railroad Purchases Are Being Deferred, Except Santa Fe

The automobile industry continues to buy considerable machine-shop equipment and is the mainstay of the machine-tool market in the Central States, though there is a fairly good volume of buying in other lines as compared with June, which was the best month the industry has had in a year and a half. Undoubtedly the coal and railroad strikes are holding back a good deal of business, railroad buying in particular having been deferred until a settlement of the labor troubles has been reached. The Santa Fe has gone ahead with its purchases. Thus far this road has closed for more than half of the items for which it inquired. Its total expenditure for tools and cranes will be $200,000 to $250,000.

There has been other scattered railroad buying. The New York Central, the Central Railroad of Vermont and the Rutland Railroad are among those which have made small purchases.

The automobile buying of the week has been chiefly in the Cleveland market. The Toledo Chevrolet Motor Co., Toledo, Ohio, has bought 12 multiple spindle drilling machines; the General Motors Co. has bought six special Rockford boring machines for its Chevrolet plant at Flint, Mich., both orders going to a Cleveland machinery dealer. The Studebaker Corporation, South Bend, Ind., is figuring on additional equipment, including a number of grinding machines. The Continental Motors Co., Muskegon, Mich., is placing orders from week to week.

A turret lathe manufacturer has booked an order for 14 machines for shipment to Montreal, Canada.

The Cleveland Board of Education has rejected bids on about 30 tools and will receive new bids up to Aug. 14. The Newark schools have bought about 20 tools, totaling about $25,000, for vocational training work. Berlin, N. H., schools have bought about $17,000 worth of tools and trade schools at New Britain, Conn., have bought several machines.

New York

NEW YORK, July 18.

The volume of machine-tool business that has been done so far this month, in comparison with that of June, is fairly encouraging considering the increasing uncertainties arising out of the coal and railroad strikes. Buying is mostly in small units, but more manufacturers are indicating their need of new shop equipment. A fairly large number of inquiries remain to be acted upon as soon as manufacturers can go ahead with more assurance than is possible to-day. The Newark schools placed orders last week for about $25,000 worth of machine tools and about $10,000 worth of accessories and supplies for its vocational training schools. The business was split up among several manufacturers and dealers. There is a cessation of railroad buying, due undoubtedly to the shop mechanics' strike. The New York Central has bought two turret lathes and the Central Railroad of Vermont has ordered a 1500-lb. steam hammer.

Although the crane market is generally quiet, the condition is attributed to the usual summer dullness, combined with the uncertainties of the strike situation, there is some business being closed and a few new inquiries. One of these now current is for a 10-ton, 44-ft. span electric crane from the American Car & Foundry Co., New York. The Newport News Shipbuilding & Drydock Co., Newport News, Va., which is buying a list of machine tools and cranes for its car shop is receiving bids on a small list of electric hoists. An inquiry for a 110-ton power house crane and another calling for one 40-ton electric crane are reported to be current. Among recent sales are the following:

Pawling & Harnischfeger Co., a 5-ton, 62-ft. span electric crane to the Kleckhefer Container Co., Milwaukee, Wis.

Industrial Works, a 150-ton wrecking crane to the Grand Trunk Railway System, Montreal, and a 160-ton wrecking crane to the Canadian Pacific Railway Co., Montreal, Can. Also a 15-ton, 45-ft. boom locomotive crane with bucket to the Dominion Construction Co., for Niles, Ohio, a 20-ton locomotive crane to Louis Caplan, Lebanon, Pa., and a 15-ton, 50-ft. boom locomotive crane to the Duluth-Superior Dredging Co., Duluth, Minn.

Shepard Electric Crane & Hoist Co., a 5-ton, 32-in. span electric crane to the Meeker Union Foundry, Norwalk. Conn.

Bedford Foundry & Machine Co., a 50-ton, 70-ft. 9-in. span overhead traveling crane with 15-ton auxiliary to the Central Penn Power Co., Saxton, Pa.

Ohio Locomotive Crane Co., a 20-ton, 50-ft. boom locomotive crane with Hayward bucket to the Central Penn Power Co., Saxton, Pa.

Niles-Bement-Pond Co., a 10-ton, 80-ft. span, electric crane to the M. W. Kellogg Co., Jersey City, N. J., and a 4-ton, 48-ft. span, hand power crane to W. R. Grace & Co. for export to Peru.

The General Motors Corporation, 224 West Fifty-seventh Street, New York, will remove the machine shop and parts department of its Buick Motor Co. division from the building at Fifty-second Street and the Hudson River to the new six-story building on Eleventh Avenue and Fifty-fifth Street, ground for which recently was broken. The capacity will be increased at the new location and additional machinery installed. The service and parts departments of the Oakland Motor Car Co. division will be established also in the new building, which will have a total floor area of 140,000 sq. ft. Both plants will be entirely separate and complete in themselves. It is expected to have the structure ready for occupancy early in the fall.

The Coffield Radio Equipment Corporation, Ellenville, N. Y., is planning for the installation of machinery for the manufacture of wireless instruments and apparatus.

A power house will be installed at the new four-story and basement plant to be erected on Mill Street, Poughkeepsie, N. Y., by the American Chocolate Products Co., 158 Broadway, New York, estimated to cost about $350,000. Andrews, Towers & Lavalle, 21 East Fortieth Street, New York, are architects and engineers.

John L. Miller, 1947 Broadway, New York, is having

plans completed for a one-story automobile service and repair building, 125 x 150 ft., at West 210th Street, Tenth Avenue and Broadway, estimated to cost close to $75,000. Frank Hausle, 81 East 125th Street, is architect.

The Baragua Sugar Co., 25 Broad Street, New York, a subsidiary of Punta Alegre Sugar Co., Camaguey Province, Cuba, is disposing of a bond issue of $4,500,000, a portion of the proceeds to be used for extensions and betterments and additions to working capital. Edwin F. Atkins is president.

The New York Edison Co., 130 East Fifteenth Street, New York, has plans under way for a new three-story power house, 45 x 125 ft., at 12 Stone Street, estimated to cost about $90,000. William Whitehall, 709 Sixth Avenue, New York, is architect and engineer.

Charles Serota, 1575 President Street, Brooklyn, has plans nearing completion for a one-story automobile service and repair works, 100 x 100 ft., on Chauncey Street. Charles Goodman, 375 Fulton Street, is architect.

The Ford Motor Co., Highland Park, Mich., has awarded contract to the Fred T. Ley Co., Springfield, Mass., for two buildings, each one-story, 110 x 120 ft., at its new plant at Green Island, N. Y., used for the manufacture of ball and roller bearings, automobile and tractor parts, etc. A store house and concrete dock will also be constructed at this time, and other factory structures later. Albert Kahn, 1000 Marquette Building, Detroit, is architect.

The Jane Street Garage, Inc., New York, recently organized, has leased the two-story building now being erected at 11-19 Jane Street, for the establishment of an automobile service and repair works. The company is headed by H. J. Schaus and W. G. Stira, and is represented by I. L. Broadwin, 55 Liberty Street.

The New York Steam Co., 280 Madison Avenue, New York, operating power plants for general commercial service, has acquired two-five-story buildings, 43 x 122 ft., at 222-26 Pearl Street, adjoining its present property, for proposed extensions.

The New Jersey Concrete Products Corporation, Dover, N. J., has acquired the plant of the Pre-Cast Concrete Co., near Dover, for expansion in the line of pre-cast structural concrete and kindred products.

A vocational department will be installed in the new two-story and basement high school at Bridgeton, N. J., 61 x 195 ft., for which ground will be broken at once. It is estimated to cost about $225,000. Ritter & Shay, North American Building, Philadelphia, are architects.

The Thomson Machine Co., 298 Main Street, Belleville, N. J., manufacturer of bakers' machinery, has awarded contract to the John W. Ferguson Co., Paterson, N. J., for a two-story addition, totaling about 75,000 sp. ft. of floor area, estimated to cost about $150,000, including equipment.

The Edison Lamp Works of the General Electric Co., Harrison, N. J., has acquired about 175 acres at Parsippany, N. J., for future expansion. Plans are being prepared, it is said, for a number of buildings and as soon as these are completed an official announcement will be made.

D. W. May, Inc., Newark, N. J., operating an automotive electrical repair and service works, has removed to its new building at 319-25 Central Avenue, where 10,000 sq. ft. of floor area will be provided for extensions in the different departments, including machine repair, lighting and starting equipment, etc.

A vocational department will be installed in the three-story and basement high school to be erected on Northfield Avenue, West Orange, N. J., estimated to cost about $400,000. Guilbert & Betelle, 546 Broad Street, Newark, N. J., are architects.

The Board of Education, City Hall, Newark, will take bids until July 27 for vocational equipment, including hand and other tools for machine shop, electrical shop, wood-working department and automobile repair shop; electrical instruments; electrical equipment; wood-working benches and wood-working machinery; sterilizer and stand, and other equipment. The new Seymour Vocational School has been completed, and equipment will be installed so as to have the structure ready for occupancy in the fall. R. D. Argue is secretary.

The Chemical Treatment Co., Newark, manufacturer of specialties for the treatment of iron and steel, has leased the three-story and basement building at 264-68 Jeliffe Avenue, totaling about 13,000 sq. ft. of floor area, and adjoining land, 105 x 250 ft. The latter property will be used for the erection of an addition later. Joseph D. Sears is one of the heads of the company.

A power house, 33 x 45 ft., will be erected in connection with the new three-story hospital to be built by the Vineland Hospital Association, Vineland, N. J., estimated to cost about $150,000. Stern & Woodnut, Stephen Girard Building, Philadelphia, are engineers.

Chicago

CHICAGO, July 17.

THE Santa Fe has made further purchases against its inquiry and thus far has closed for more than half of the items listed, with the probability that the remainder will be bought in the coming week. The road's total expenditures for the tools and a 150-ton crane also on inquiry, will range from $200,000 to $250,000. The shopmen's strike is interfering with the placing of other pending lists, as the mechanical departments and, in some cases, railroad clerical forces, generally are being enlisted to do the shop work which is absolutely essential to keep trains running. Action on the Union Pacific and Burlington inquiries has been definitely postponed while it is beginning to appear unlikely that the Illinois Central will place orders for some time.

Local dealers continue to report a slow improvement in trade from miscellaneous sources, although new inquiries are not so plentiful as in June. It is notable, however, that considerable equipment which has been pending for several weeks is now being purchased with the result that total sales for July are expected to be larger than in June. One representative machine tool house has thus far booked 75 per cent of its aggregate sales in the entire month of June. The Studebaker Corporation, South Bend, Ind., and the Continental Motors Co., Muskegon, Mich., continue to place a few orders from week to week, rather than to make large purchasers at one time.

Radial drill manufacturers have generally advanced their prices five per cent. Additional companies which have announced advances include the Carlton Machine Tool Co., the Cincinnati Bickford Tool Co. and the Dreses Machine Tool Co., all of Cincinnati, and the Western Machine Tool Works, Holland, Mich. Other price changes include a reduction of five per cent on emery grinders by the Ramson Mfg. Co., Oshkosh, Wis., and an advance of about 10 per cent by the Dalton Mfg. Corporation, Sound Beach, Conn., on its 6-in. type "TL" motor-driven engine lathe only.

The Whiting Corporation has sold a No. 6 cupola and a tumbling barrel to the Bucyrus Co., South Milwaukee, Wis., and a 3-ton overhead electric traveling crane to the Kellogg's Toasted Corn Flake Co., Battle Cheek, Mich.

The Roach-Appleton Mfg. Co., 2446-56 North Crawford Avenue, Chicago, recently incorporated with $100,000 capital stock, will manufacture electrical specialties and protecting materials and also special stampings and assemblies. It has taken a five-year lease on the plant at the address given, which contains 13,000 sq. ft. of floor space with a switch track connection on the Chicago, Milwaukee & St. Paul Railroad. Purchases of punch and drill presses and tool room equipment have been made. The officers are Ernest G. Appleton, president and treasurer; Walter O. Roach, vice-president and general manager, and John N. Willson, secretary. All of these men were formerly employed by the Chicago Fuse Mfg. Co., Mr. Appleton as superintendent, for the past 25 years; Mr. Roach as assistant general sales manager and Eastern sales manager during a period of 10 years, and Mr. Willson, as purchasing agent for four years.

The American Medical Association, 535 North Dearborn Street, Chicago, has let the general contract for a six-story mercantile building at 535 to 538 North Dearborn Street, to cost $350,000, to R. C. Wieboldt Co., 1534 Van Buren Street, Chicago.

The Chicago By-Products Coke Co., 122 South Michigan Avenue, has awarded contract to the Koppers Co., same address, for a one-story first aid building at 3524 South Crawford Avenue, to cost $9,000 and for a garage near Crawford Avenue and Thirty-fifth Street to cost $5,000.

C. W. Lampe, 155 North Clark Street, Chicago, is completing plans for a one and two-story addition to the furniture factory of Fenske Brothers, 1666 McHenry Street, to cost $20,000.

The Broline, Nolan Co., 5 North LaSalle Street, Chicago, has the general contract for a two-story factory, 100 x 125 ft., at 3317 and 3319 Elston Avenue, for Pelton & Pelton, to cost $65,000.

Fugard & Knapp, 212 East Superior Street, Chicago, have

taken bids for a three-story printing plant, 80 x 100 ft., on the corner of North Franklin and Locust streets, for the Neely Printing Co., 412 Orleans Street, to cost $100,000.

The Public Service Co. of Northern Illinois, 72 West Adams Street, Chicago, will take bids before the close of the month for the first unit of its new steam-operated electric power plant on Greenwood Avenue, Waukegan, Ill., to be 100 x 300 ft., and estimated to cost close to $1,000,000, including machinery. H. Van Holst, company address, is engineer.

The Denver & Salt Lake Railroad, Denver, Colo., has preliminary plans for rebuilding its shops at Utah Junction, destroyed by fire, July 4, with loss of about $700,000.

The Washington Foundry Co., Washington and Eagle streets, St. Paul, Minn., has awarded contract to the F. J. Romer Construction Co., 190 Ramsey Street, for a one and two-story addition, 75 x 165 ft., and 22 x 100 ft.

The Northern States Power Co., Minneapolis, Minn., is disposing of a bond issue of $2,000,000, a portion of the proceeds to be used for extensions and improvements.

The Sager Metal Weather Strip Co., 190 North State Street, Chicago, has leased a floor at 162 West Austin Avenue for extensions.

Plans are being completed for a municipal electrically operated pumping plant at Waukegan, Ill., in connection with filtration plant and intake, estimated to cost about $950,000, including machinery. M. J. Dothit is city engineer in charge; Hoad, Decker & Drury, 303 South State Street, Ann Arbor, Mich., are consulting engineers.

The Watab Paper Co., Sartell, Minn., has arranged for a bond issue of $1,250,000, a portion of the proceeds to be used for extensions and improvements. David E. Town is president.

The Duluth Motor Co., Duluth, Minn., has preliminary plans for a new two-story service and repair building, 100 x 150 ft., on First Avenue, estimated to cost about $75,000. Ellingsen & Erickson, Lonsdale Building, are architects.

The Mutual Oil Co., Denver, Colo., operating oil refineries, is arranging for an increase in capital from $15,000,000 to $30,000,000, a portion of the proceeds to be used for plant extensions and improvements, and the purchase of additional properties.

A vocational department will be installed in the new high school to be erected at Litchville, N. D., estimated to cost about $600,000, for which bids on a general contract are being asked up to July 24. W. D. Gillespie, Fargo, N. D., is architect.

Motors, power equipment, ovens, conveying machinery and other mechanical equipment will be installed in the new two-story plant, 100 x 193 ft., to be erected by the Maier-Roedel Baking Co., Inc., 5029 North Western Avenue, Chicago, estimated to cost about $165,000, including machinery.

The Iowa Traction Co., Cedar Rapids, Iowa, has preliminary plans under way for a new hydroelectric generating plant on the Des Moines River, near Boone. J. D. Wardle, company address, is engineer.

Buffalo

BUFFALO, July 17.

The Pioneer Paper Co., Inc., Ballston Spa, N. Y., is desirous of securing a small amount of fabricated steel, together with one or more wooden tanks.

The Ilex Mfg. Co., 726 Portland Avenue, Rochester, N. Y., manufacturer of camera shutters and other precision equipment, has plans under way for the erection of a three-story addition, 85 x 220 ft., estimated to cost about $200,000, including machinery.

The Gallagher Motor Corporation, Rochester, care of Carl Ade, 344 East Avenue, architect, has awarded contract to the Henry Stallmans' Sons Co., Arlington Building, for a two-story automobile service and repair works, 70 x 160 ft., on Monroe Avenue.

The Board of Education, 1401 Telephone Building, Buffalo, will take bids until July 26 for equipment for the several vocational schools, and until July 24 for drafting and drawing room supplies required from July, 1922, to April, 1923. D. J. Sweeney is deputy superintendent of business and accounts, in charge.

The Retsof Mining Co., Retsof, N. Y., will build a one-story machine shop in connection with its new salt mining and refining plant. With machinery, it will cost in excess of $100,000.

A vocational department will be installed in the new high school, two-stories, 80 x 180 ft., to be erected at Solvay, N. Y., estimated to cost about $400,000, for which bids will be asked this month. M. L. King, Snow Building, Syracuse, N. Y., is architect.

Townsend, Krug & Green, Perry, N. Y., manufacturers of cutlery, have established a branch plant at Hamilton, Ont.

The Hodes-Zinc Co., Fremont, Ohio, manufacturer of automobile equipment and accessories, is considering plans for a branch factory at Erie, Pa.

The board of managers, State School for Mental Defectives, Rome, N. Y., will take bids until Aug. 7 for engines and electric generators for installation at the power plant of the institution. L. F. Pilcher, Capitol Building, Albany, N. Y., is State architect. Charles Bernstein is superintendent.

The Defiance Paper Co., Walnut Avenue, Niagara Falls, N. Y., has awarded contract to Braas Brothers, 1110 Whitney Avenue, for a one-story paper mill addition, 50 x 200 ft., estimated to cost close to $200,000, including machinery and alterations in the present mill.

E. P. Leitz, 463 Connecticut Street, Buffalo, is arranging a list of machine tools, bench tools, etc., for installation at his automobile service and repair shop on Genesee Street.

The Niagara Falls Power Co., Niagara Falls, N. Y., has ordered a 70,000-hp. generator for its hydroelectric power plant extension to the Allis-Chalmers Mfg. Co., Milwaukee, Wis., at a cost of about $850,000. Two other units of approximately the same size have been ordered from the General Electric Co., Schenectady, N. Y., for use at the same station.

Conveying and hoisting equipment, finishing and polishing machinery, etc., will be installed in the new plant of the Lautz Marble Co., 861 Main Street, Buffalo, estimated to cost about $85,000.

Bids are being asked by the National Biscuit Co., Buffalo, for a one-story automobile service and repair building, 120 x 125 ft., on Urban Street, for company cars and trucks. Headquarters are at Tenth Avenue and Fifteenth Street, New York. A. G. Zimmerman, company address, is architect.

The Rochester Gas & Electric Co., Rochester, will install new equipment at its power plant, including electrical and steam apparatus to utilize surplus hydraulic power. F. J. Howes is chief engineer.

Philadelphia

PHILADELPHIA, July 17.

The Hellwig Silk Dyeing Co., Ninth and Buttonwood streets, Philadelphia, has awarded contract to F. W. Van Loon, Perry Building, for a one-story machine shop, 40 x 240 ft., to cost about $45,000. A portion of the building will be used for a service works for company automobiles.

George D. Ellis & Sons, Inc., 309 North Third Street, Philadelphia, manufacturer of tin cans, etc., is planning for the installation of additional equipment.

The Philadelphia Electric Co., Tenth and Chestnut streets, Philadelphia, has arranged for an increase in capital from $60,000,000 to $67,085,000, a portion of the proceeds to be used for extensions and improvements. A new power house will be erected on Race Street to cost about $70,000, and work will soon commence on an addition to the Franklin power station, Sixth Street. A new power house will be built at American and Susquehanna avenues.

The Universal Service Motors Co., 1407 Locust Street, Philadelphia, has awarded contract to P. M. Sax, Penfield Building, for an addition to its works at Seventeenth and Manning streets, comprising a six-story and basement building, 70 x 117 ft. William M. Godfrey is president.

The Wills Sainte Claire Co. of Pennsylvania, 2033 Market Street, Philadelphia, manufacturer of automobiles, has leased a portion of the new building to be erected at 207-209 North Broad Street for a new service and repair branch.

Proctor & Schwartz, Inc., Seventh Street and Tabor Road, Philadelphia, manufacturer of drying machinery, is arranging for a merger with the Smith & Furbush Machine Co., Hancock and Somerset streets, manufacturer of textile machinery, in which it has held a controlling interest for a number of years. The consolidated company will be capitalized at $2,500,000, and will be operated under the first noted name. Plans are under way for extensions in the works at Seventh Street and Tabor Road. Upon completion, the Smith & Furbush plant will be removed to this location and the present plant discontinued. Walter M. Schwartz will be president of the combined company, and Frank E. Schermerhorn, secretary and treasurer.

The Fidelity Machine & Mfg. Co., 4015 Paul Street, Philadelphia, will break ground at once for a new one-story and basement plant, 86 x 200 ft., at Frankford Avenue and Wheatsheaf Lane, estimated to cost about $60,000. John M. Higginbotham is president.

The R. B. Dutt Co., 1736 North Mascher Street, Philadelphia, will commence the immediate erection of a one-story power house at its dye works.

The Delaware County Electric Co., Lansdown, Pa., has arranged for an increase in capital from $12,800,000 to

$15,000,000, a portion of the proceeds to be used for extensions and improvements.

The De Zeng-Standard Co., Camden, N. J., has taken out a State charter to manufacture surgical, medical and optical instruments and parts. A plant is now in operation on East State Street and work will commence at an early date on a branch plant at Geneva, N. Y., to cost about $50,000. The company is headed by Henry L. De Zeng, Charles H. Kerr and Samuel W. Cafferty.

The Trent Tile Co., Flagg Avenue, Trenton, N. J., will commence the immediate erection of a one-story power house.

Thomas J. Lee and associates, Philipsburg, Pa., are arranging for the reorganization of the Nickel Fabricating Co., whose plant recently was acquired under bankruptcy proceedings. It is proposed to change the name of the company, remodel the works and commence production at an early date.

Work will soon commence on a new power house, 100 x 130 ft., at the plant of the Scranton Lace Co., Scranton, Pa., estimated to cost about $150,000, including a 150-ft. stack. Lockwood, Greene & Co., 101 Park Avenue, New York, are architects. Paul B. Belin is general manager.

The Lexington Motor Co. of Pennsylvania, 851 North Broad Street, Philadelphia, manufacturer of automobiles, has acquired the building at 4624-28 Chestnut Street, totaling about 20,000 sq. ft. of floor space. It will be remodeled as a service and repair works, to include a complete machine shop.

The McGann Mfg. Co., York, Pa., is planning for the installation of a 10-ton electric traveling crane.

The Excelsior Electric Light, Power & Gas Co., 834 Land Title Building, Philadelphia, is perfecting plans for a merger with other electric power companies operating in the West Rockhill Township district, including the West Rockhill Township Electric Light & Power Co., and the East Rockhill Township Co. The new corporation will be known as the Excelsior Electric Light & Power Co., and has plans under way for extensions and improvements. Daniel W. Simkins is secretary.

Bernard S. Pincus, Twenty-first and Market streets, Philadelphia, operating a provision business, will commence the immediate erection of a new two-story ice and cold storage plant at 454-58 North American Street, estimated to cost about $85,000.

The State Board of Control, Administration Building, Scranton, Pa., will soon commence the installation of new equipment at the power house at Adams Avenue and Gibson Street, estimated to cost close to $60,000. J. H. Williams, 425 Washington Avenue, is president of the board.

The Pennsylvania Edison Co., Easton, Pa., has arranged for a bond issue of $57,000, the proceeds to be used in part for extensions and improvements.

A two-story and basement service building, 45 x 75 ft., with machine department, will be constructed by the Western Union Telegraph Co., 195 Broadway, New York, at Harrisburg, Pa., estimated to cost about $40,000. Stone & Webster, Inc., 147 Milk Street, Boston, is engineer.

The Susquehanna Castings Co., Wrightsville, Pa., is arranging a list of equipment for installation at its proposed foundry at New Oxford, Pa.

Fire July 14, destroyed the plant of the Nitroloid Corporation of America, Stroudsburg, Pa., manufacturer of composition products, with loss estimated at $250,000, including machinery.

In connection with remodeling and improving the Driscoll Building, South Cameron Street, Harrisburg, Pa., by the State Motors Co., representative for the Chevrolet automobile, a complete machine and repair shop will be operated on the second floor, while the third floor will be given over to a parts department and auxiliary service works. N. K. van Der Zee is local manager.

Fire, July 11, destroyed the brass foundry at the plant of Orr & Sembower, Inc., Millmont, Pa., manufacturer of boilers, tanks, stacks, etc. An official estimate of loss has not been made.

The Keystone Carbonic Gas Co., Inc., Security Trust Building, Harrisburg, Pa., is taking bids on separate contracts for its new plant at Highspire, for the manufacture of carbonic gas, commercial oxygen, etc. The main building will be 60 x 140 ft. The plant is estimated to cost in excess of $300,000, including machinery. C. J. Smith, company address, is architect and engineer. S. S. Bailey is president.

Fire, July 10, destroyed a portion of the planing mill of Reitz & Snyder, Palmerton, Pa., with loss estimated at about $75,000, approximately $25,000 representing machinery.

Cleveland

CLEVELAND, July 17.

THE automobile industry continues to buy considerable equipment. The Toledo Chevrolet Motor Co., Toledo, Ohio, has purchased 12 multiple drilling machines from the National Automatic Tool Co., Richmond, Ind., and the General Motors Corporation purchased six special Rockford boring machines for its Chevrolet plant in Flint, Mich., both orders being placed with a Cleveland machinery house. A turret lathe manufacturer has booked an order from Montreal for 14 machines. The Studebaker Corporation, South Bend, Ind., is figuring on a number of grinding machines and will probably purchase additional equipment. There is considerable demand, particularly from the automobile field, for special single purpose machines for production work. Many manufacturers in this field are looking for equipment which will enable them to reduce production costs.

The coal and railroad strikes are apparently having the effect of reducing machinery business. Some buyers who have had inquiries out show a hesitancy about placing orders because they feel that the strike situation may have some effect on general business conditions. There is also some evidence of the usual summer lull and the volume of sales is showing some falling off as compared with June. The Cleveland Board of Education has rejected bids for about 30 machine tools and will receive new bids Aug. 14.

The F. P. Screw Co., East Seventy-ninth Street, Cleveland, manufacturer of cap and set screws, is enlarging its plant by an addition providing 5000 sq. ft. of floor space for manufacturing purposes. It recently purchased the equipment of the Cleveland Valve & Mfg. Co.

The Commercial Galvanizingg & Mfg. Co., Warren, Ohio, has been incorporated with a capital stock of $50,000 and will erect a plant near the Warren Tool & Forging Co., to manufacture containers for transporting oil, petroleum and tar, together with a galvanizing department. T. E. Bromley, J. J. Hehet, B. F. Fletcher, R. C. Kunlow and Frank Baker are the incorporators.

The International Lead Refining Co., a subsidiary of the Anaconda Copper Mining Co., has acquired a site at Bettes Corners, Akron, Ohio, on which it will shortly commence the erection of a plant to manufacture zinc oxide. Four structural buildings will be erected.

The Hermann Tire-Building Machine Co., Columbus, Ohio, has purchased the A. R. McDonald machine shop, St. Marys, Ohio, for the manufacture of tire building machinery. Walter H. Hermann is president.

F. E. Myers & Brother, Ashland, Ohio, have had plans prepared for a foundry addition.

The Ford Motor Co., Detroit, is considering the rearrangement of handling raw material in its River Rouge foundry and recently sent out an inquiry for a car dumper with a view of using this for unloading the pig iron, coke and other raw material.

Detroit

DETROIT, July 17.

The Barton Auto Top Co., 4445 Woodward Avenue, Detroit, has awarded a contract to W. M. Pratt, Penobscot Building, for a new three-story plant, 62 x 160 ft., on West Canfield Avenue, estimated to cost about $50,000, including equipment. Albert Barton is president.

The Detroit Stoker Co., 7342 Woodward Avenue, Detroit, has acquired the plant of the Van Blerck Motor Co., Monroe, Mich., for the establishment of new works. It plans to install equipment and commence operations at an early date. Employment will be given to about 200.

The Ford Motor Co., Highland Park, Mich., has completed plans for the construction of a new one-story laboratory and mechanical research plant, 200 x 800 ft., estimated to cost about $500,000, including equipment. It will replace 13 temporary buildings of this character erected during the war. The company is reported to have preliminary plans under consideration for the erection of a new assembling plant, on site to be selected in Mexico.

The Aetna Portland Cement Co., 412 Union Trust Building, Detroit, is laying foundations for the initial buildings at its new plant on property recently acquired at Essexville, Mich., estimated to cost close to $1,000,000. It will include a

number of cement mills, machine shop, power plant and other structures.

The Auto Specialties Mfg. Co., St. Joseph, Mich., manufacturer of automobile jacks, shock absorbers and kindred equipment, is disposing of a bond issue of $350,000, a portion of the proceeds to be used for extensions and improvements. J. W. Tiscornia is vice-president.

A detached power plant will be erected in connection with the new two-story high school to be constructed on the East Side, Saginaw, Mich., estimated to cost about $250,000. J. F. Beckbissinger, 114 South Jefferson Street, is architect.

The Hupp Motor Car Corporation, Milwaukee and Mt. Elliott Avenues, Detroit, is clearing the site adjoining its plant preparatory to the erection of its proposed new unit, estimated to cost about $2,000,000, including machinery. Charles D. Hastings is president and general manager.

The Fisher Body Corporation, General Motors Building, Detroit, is perfecting plans for the erection of additional units to the new plant now in course of erection at Junction Avenue and the Michigan Central Railroad, to be occupied by its subsidiary organization, the Shepard Art Metal Co., with present plant at Grand Boulevard and Hastings Street. The first unit will have a total area of about 100,000 sq. ft., all of which will be given over to the manufacture of hardware specialties, locks, etc., for automobile body construction. Later units will increase the floor space to about 250,000 sq. ft. The Fisher company has acquired the plant and business of O. J. Beaudett & Co., Pontiac, Mich., manufacturers of automobile bodies, and will continue the works as one of its divisions. The Pontiac plant approximates 300,000 sq. ft. of floor space, and will give employment to about 1500.

New England

BOSTON, July 17

THE machine tool situation in this section is more encouraging. The market is far from active, but enough equipment has been moved the past week to lead the trade to believe that July bookings will be larger than anticipated early in the month. Some machine tool builders as a result of the strike are securing shop work direct from the railroads and from car repair interests engaged in special work for the carriers, making it necessary to take on additional men in some instances. The Rutland Railroad apparently is better off for mechanical help than other New England transportation companies, its shop force being about 80 per cent. of normal. The Boston & Maine is concentrating its efforts on securing help in one Massachusetts shop where it has 1000 mechanics, contrasted with 3000 before the strike.

In going business new tools have again led used machinery. Sales the past week include a 1500-lb. steam hammer, 2-in. turret machine, 20-in. lathe, Warner & Swasey chucking machinery and a structural steel shear taken by the Central Vermont Railroad; a 400-ton wheel press and two small grinders sold to the Rutland Railroad; a new hack saw, used 22-in. planer, two used 14-in. lathes, a new 12-in. shaper, new sensitive drill with single spindle and a new arbor press for New Britain, Conn., trade school purposes; 23 miscellaneous machine shop tools, blacksmith equipment and $1,300 worth of supplies, the whole amounting to a little less than $17,000, taken by the Berlin, N. H., Board of Education. The machine tools were divided among five local dealers, the largest amount going to any one being approximately $3,000. Other sales include a new 14-in. lathe and four screw shaving machines to a Massachusetts concern about to engage in special piston ring grooving work; a new large multiple drilling machine to a Providence firm and several new and used single machines. A better demand for wood-working equipment is reported. New inquiries include one for complete machine shop equipment from India.

The price situation on new tools appears stronger.

Coal handling machinery is wanted by the Boston Elevated Railway, 108 Massachusetts Avenue, Boston, for its South Boston plant.

Bids closed last week on a three-story, 43 x 102 ft. addition to the State trade school, New Bedford, Mass.

The New York, New Haven & Hartford Railroad this week will reopen its Norwood, Mass., steel car shops, closed since Dec. 24, 1921.

The American Can Co. has taken a long-term lease from the Boston Wharf Co. of the six-story and basement building at 22-24 Midway Street, South Boston.

The New Bedford Textile School, New Bedford, Mass., is planning the erection of a four-story brick and steel addition. Leary & Walker, Times Building, New Bedford, are the engineers. Contract will be awarded shortly.

The Bridgeport Furnace Works, Bridgeport, Conn., is removing to a new plant at 1661 Main Street, from 187 Congress Street, and will install equipment to manufacture iron elbows and other furnace fittings.

The Quincy Electric Light & Power Co., Quincy, Mass., has received permission to issue capital stock for $140,000, and bonds for $250,000, a portion of the proceeds to be used for extensions and improvements in plant and system.

The Connecticut Light & Power Co., West Main Street, Waterbury, Conn., has plans under way for a new electric generating plant on the east side of the Housatonic River, near Devon, estimated to cost in excess of $400,000.

The Military Emergency Board, State Armory, Hartford, Conn., has awarded contract to Payne & Keefe, Manwaring Building, New London, Conn., for a new one-story mechanical building, 85 x 150 ft., at Branford, Conn., to cost about $40,000.

The Safety Car Heating & Lighting Co., Dixwell Avenue, Hamden, Conn., is completing plans for a new one-story building, 100 x 194 ft., for battery plate production, and a one-story addition to the present building, 106 x 115 ft. Stovel & Brinkerhoff, 136 Liberty Street, New York, are engineers and contractors.

A vocational department will be installed in the new junior high school to be erected at Somerville, Mass., estimated to cost about $800,000, for which Ritchie, Parsons & Taylor, 15 Ashburton Place, Boston, are architects.

The Cumberland County Power & Light Co., Congress and Elm streets, Portland, Me., has foundations in progress for a new electric generating plant at South Portland, estimated to cost $1,000,000, including machinery.

The Saco-Lowell Shops, 77 Franklin Street, Boston, manufacturers of textile machinery and parts, have palns under consideration for an addition to the plant at Lowell, Mass.

The New Bedford Gas & Edison Light Co., New Bedford, Mass., has arranged for a capital stock issue of $1,602,720, a portion of the proceeds to be used for plant extensions and improvements.

Cincinnati

CINCINNATI, July 17.

WHILE it was expected that July would be a quiet month in the machine tool industry, the number of orders booked the past week was a source of much satisfaction to local manufacturers. While no large purchases were made, single orders were well up to the average of the past few weeks. In addition to domestic business, an export order for six tools was booked and shipped from stock by a local manufacturer. An Indianapolis manufacturer bought five tools from a local firm and an Indiana automobile manufacturer also placed an order for six special machines for manufacturing parts. A Cincinnati manufacturer received a contract from a Pittsburgh district steel company for six lathes and was in receipt of an order from a printing press manufacturer in the East for a number of tools.

The Ford Motor Co. is in the market for a number of special machines and the Louisville & Nashville railroad also has an inquiry out for several tools.

Local manufacturers report a scarcity of good men and are forced to pay much higher wages than recently to secure enough mechanics to take care of orders.

Littleford Brothers, sheet metal workers, Cincinnati, have awarded the contract for a three-story office building and a two-story factory adjoining their present property on East Third Street. The building will be 45 ft. x 240 ft. of reinforced concrete. The Austin Co. of Cleveland, are the architects.

The Warner Elevator Co., Spring Grove Avenue, Cincinnati, has awarded the contract for an addition to contain approximately 38,000 sq. ft. of floor space. It will be used principally as an assembling floor.

The plant of the Louisville Cement Co., near Jeffersonville,

Ind., was damaged by fire to the extent of $250,000 on July 13. About $75,000 worth of machinery was destroyed. It is understood that the works will be rebuilt as soon as plans can be prepared.

The receiver's sale at the plant of the Allen Motor Car Co., Columbus and Bucyrus, Ohio, the past week brought approximately $210,000. The real estate owned by the company at Columbus was not disposed of.

The Lowe Brothers Co., paint manufacturer, Dayton, Ohio, is having plans prepared for a 7-story addition at Wayne Avenue and the Baltimore & Ohio Railroad, of reinforced concrete, 60 x 270 ft. Frank Hill Smith, Inc., Dayton, Ohio, is the engineer.

Milwaukee

MILWAUKEE, July 17.

THE machine-tool business so far in July has not differed materially from that in May or June, but it is encouraging to note that volume is slowly but steadily assuming broader proportions. Demand remains spotty and spasmodic and purchases still are confined to the most urgent needs. On the other hand, replacement requirements have enlarged and embrace needs for additional capacity. This is especially true of the automotive industries, which in general continue along the active lines developed in the last three to five months. Agricultural machinery manufacturers begin to feel a substantial revival which is believed to portend a resumption of equipment needs. Milling machine demand, while not normally active, is gradually increasing, making production schedules of local plants not only heavier but much more regular.

Prospects for the selection of Milwaukee as the location of a proposed American aircraft works by A. H. G. Fokker of Amsterdam and Rotterdam, Holland, appear bright as the result of a conference of 50 leading business men called by the Milwaukee Association of Commerce to consider a definite proposition on July 12. It is understood that commercial organizations in New York, Chicago, Dayton and Columbus, Ohio, are entertaining similar propositions. The prospective investment is $3,000,000, of which amount the inventor and manufacturer proposes to furnish approximately 80 per cent. Francis A. Vaughn, president F. A. Vaughn, Inc., consulting engineer, 290 Third Street, is representing the Milwaukee interests.

The Scolding Locks Hair Pin Co., Appleton, Wis., manufacturer of hair pins and other wire specialties and novelties, has broken ground for a new factory, 40 x 200 ft., one story and part basement, at Appleton Junction. The present shop equipment will be augmented by miscellaneous purchases upon which inquiries are about to be put out. The total investment is estimated at $75,000.

Frank Holton & Co., Elkhorn, Wis., manufacturers of band and orchestra instruments and metal music specialties, has let contract to Morrissey Brothers, local, for a two-story brick, concrete and mill-floored addition, 40 x 80 ft., which will cost about $45,000, including additional equipment. This will include drawing, stamping, pressing, polishing, plating and other machinery. Harry J. Charlton is secretary and general manager.

J. H. Saris, Ford dealer, Beloit, Wis., has placed the complete contract with the W. G. Fitzgerald Co., 726 Central Avenue, local, for a new garage, sales and service establishment, 100 x 130 ft., two stories and basement, at 412 Broad Street. The machine shop department will occupy a space, 75 x 100 ft., and the building and equipment will cost about $100,000. The architects are J. E. Hetherington & Son, 105 North Clark Street, Chicago.

The Republic Box Co., Chicago, has plans for a new box and crating factory to be erected at Marinette, Wis., in place of the plant almost totally destroyed by fire last fall. It will be of brick and steel, one story, 100 x 250 ft., with several wings and a separate power plant and boiler house. Commencement of the work has been delayed, but the recent substantial betterment in general business conditions is expected to bring a decision to start shortly. John Stunkel is secretary.

Gregor Lenz, Little Chute, Wis., dealer and repairer of automobiles, tractors, etc., will erect a one-story building, 60 x 120 ft., designed by A. A. Nelson, architect, Neenah, Wis. It will cost about $20,000 complete.

The L. Niemcheck Mfg. Co., Milwaukee, has been incorporated with a capital stock of $25,000 to manufacture tools, dies, jigs, fixtures, metal stampings, etc. It takes over the business of a similar character developed in recent years under the style of Niemcheck & Wenzel, at 313 Poplar Street, Milwaukee. Ludwig Niemcheck, E. Wiznerowicz and S. L. Grzechowiak are the principals in the new organization.

Milwaukee and Appleton interests, as yet unidentified, are negotiating for the lease or purchase of the plant of the Rex Foundry Co. at Schleisingerville, Wis., to remodel and equip it for the manufacture of steel castings by the electric furnace process. It is proposed to employ about 50 at the start. The commencement of operations is dependent upon how soon arrangements can be made for the supply of current from the Milwaukee Electric Railway & Light Co. At present only a tributary line supplies customers at Schleisingerville, which is inadequate for electric furnace requirements.

The Bahde Mfg. Co., 2616 Vliet Street, Milwaukee, has let the general contract to Paul Bringe & Co., 940 Third Street, for a one-story brick and concrete machine shop, 30 x 104 ft., at Thirtieth and Chambers streets. It will require new equipment throughout. As previously reported, it was recently incorporated to manufacture mechanical appliances on a royalty basis under contracts with inventors and designers. The initial investment will be about $20,000.

The Herman Motor Car Co., Appleton, Wis., expects to start work shortly after Aug. 1 on a two-story brick and concrete garage and repair shop, 80 ft. square, one floor of which will be equipped for machine work. It will cost about $25,000.

The Claybourn Process Corporation, Milwaukee, organized recently by L. W. Claybourn, Menasha, Wis., to manufacture automatic multicolor printing presses, has been granted permits for the erection of its manufacturing group at Humboldt Avenue, Franklin and Becker streets, plans for which have been prepared by Herman J. Esser, architect, 402 Camp Building, Milwaukee. The main building will be 122 x 124 ft., one story, of brick and steel; the power house, 30 x 80 ft., one story; the assembling, warehouse, storage, administration and general purpose building, 103 x 122 ft., two stories and basement. The cost of the structures is estimated at $175,000. Machinery and equipment will cost in the neighborhood of $125,000 to $150,000 additional.

The Heating & Power Appliance Co., Milwaukee, organized some time ago by F. L. Hutchinson, has established a factory and machine shop at 200-210 Pleasant Street to manufacture a new type of valve for vacuum, vapor and atmospheric systems of heating. It also manufactures other heating and power appliances, steam and electric driven pumps, fire brick, etc., and does general heating and power engineering and contracting. Mr. Hutchinson is president; M. V. Eicholtz, vice-president, and W. M. Tuckwell, secretary and treasurer.

The Meyer Furnace & Supply Co., Milwaukee, has been incorporated with a capital stock of $50,000 to manufacture furnaces, stoves, sheet metal specialties, etc. A factory has been opened at 170-174 Reed Street. The incorporators are F. W. Giese, Don Howland and H. L. Jackson.

The Northern Sash & Door Co., Hawkins, Wis., has recently increased its authorized capitalization to $100,000 to provide for enlargement of the plant and the purchase of miscellaneous equipment.

Pittsburgh

PITTSBURGH, July 17.

The National Metal Products Co., West Erie Street, Pittsburgh, is planning for a new three-story factory at West Erie and Diamond streets, to manufacture metal weatherstrips and other products, estimated to cost in excess of $75,000.

The Pittsburgh Gage & Supply Co., Thirtieth and Liberty streets, Pittsburgh, manufacturer of electrically-operated washing machines, ironing machines, etc., is disposing of a bond issue of $600,000, a portion of the proceeds to be used for extensions and additional working capital.

The Industrial Bureau of the Chamber of Commerce, Pittsburgh, is perfecting arrangements for the establishment of three new plants in the city, each of which will manufacture steel products. The company names are temporarily withheld. R. J. Seaman is head of the department in charge of the projects.

The Champion Tool Co., Meadville, Pa., is taking bids for a new one and two-story machine and forge shop, 100 x 200 ft., and 60 x 60 ft., respectively, estimated to cost in excess of $60,000, including equipment.

The Coraopolis Electric Co., Coraopolis, Pa., is being organized under State laws, to equip and operate a local electric plant and system.

The Fayro Machine & Engineering Co., Johnstown, Pa., has acquired the plant and property of the Reinhold Betterman Co., manufacturer of boilers, tanks, etc., and will operate the works. The purchasing company is erecting a plant at Sheridan, Pa., and as soon as this is completed the Betterman plant will be discontinued and the machinery removed to the new building. F. F. Faunce is president and J. C. Ayres, vice-president and treasurer.

The Hopkins Motor Co., Fifteenth Street, Wheeling, W. Va., is taking bids for a new three-story service and repair works, 40 x 60 ft., at Eoff and Fifteenth streets, estimated to cost about $50,000. E. B. Franzheim, 1425 Chapline Street, is architect.

A vocational department will be installed in the new two-story high school to be erected at Vendergrift, Pa., estimated to cost about $155,000. W. G. Eckles, New Castle, Pa., is architect.

The Warren Auto Trading Co., Wheeling, W. Va., has plans in progress for a new three-story automobile service and repair works, 60 x 125 ft., estimated to cost about $50,000.

The Harbison-Walker Refractories Co., Farmers' Bank Building, Pittsburgh, has awarded contract to Pihl & Miller, Wabash Building, for a new four-story building, 40 x 130 ft., estimated to cost about $55,000.

The Standard Plate Glass Co., Butler, Pa., is laying foundations for a new one-story building, 100 x 250 ft., estimated to cost about $100,000.

The Standard Sanitary Mfg. Co., Bessemer Building, Pittsburgh, has awarded a general contract to the Austin Co., Euclid Avenue, Cleveland, for a one-story foundry and machine shop at New Brighton, Pa., estimated to cost about $50,000.

The Fesenmeier Packing Co., Huntington, W. Va., has acquired property on Fourteenth Street and will remodel the structure for an ice-manufacturing and cold storage plant to have an initial output of 250 tons of ice per day and cold storage capacity for about 35,000 bbl. It is estimated to cost in excess of $125,000, with equipment.

The Consolidated Light, Heat & Power Co., Miller-Ritter Building, Huntington, W. Va., plans the erection of a new two-story power house, estimated to cost close to $100,000.

Baltimore

BALTIMORE, July 17.

The Consolidated Gas, Electric Light & Power Co., Lexington Building, Baltimore, will soon take bids for a new two-story power house at 6-8 McClellan Street, estimated to cost about $35,000.

The Republic Boiler & Radiator Co., Woodbury, Baltimore, recently organized, will remodel a portion of the former ordnance plant of the Government, lately acquired, for the establishment of works to manufacture boilers, radiators and other heating equipment. New buildings will be constructed, providing a total floor area of 82,500 sq. ft., estimated to cost $50,000. E. L. Stock is president.

The District of Columbia Paper Co., Water and Thirty-fourth streets, Washington, will build a new one-story hydroelectric power plant for mill service, estimated to cost close to $60,000. G. L. Nicholsen is president.

The Bureau of Supplies and Accounts, Navy Department, Washington, will take bids until Aug. 1 for the following equipment: Schedule, 56, two crank shapers; schedule 57, one upright drill, one grinding cutter and reamer, one arbor press, one twist drill grinder and one serpentine shear; schedule 58, three precision bench lathes, three engine lathes, and one toolmakers' lathe, all for the naval base at Bellevue, D. C.; also until Aug. 1 for the following equipment for Eastern and Western navy yards: Schedule 9645, 106 hand drills, 64 soldering irons, side-cutting pliers, 608 gasoline torches, 1950 pipe wrenches, 114 dozen files, and 9 chain blocks.

The Southern Power Co., Charlotte, N. C., has tentative plans for a new hydroelectric power plant on the Catawba River. It is proposed to construct a dam between Van Wyck and Great Falls, locating the plant in the vicinity of the first noted place.

The Union Machine Shop, Richmond, Va., will install a new lathe, grinder and other equipment. R. E. Savage heads the company.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until July 26 for coal and ash-handling machinery for the naval base at Hampton Roads, Va., as set forth under specification 4667.

The City Council, Valdosta, Ga., has tentative plans under way for a new electrically-operated pumping plant, to replace the station recently destroyed by fire with loss estimated at $35,000.

The General Electric Co., Citizens' and Southern Bank Building, Atlanta, Ga., has plans under way for a new local distributing building, four stories reinforced-concrete, estimated to cost about $175,000, including equipment. It is proposed to erect a one-story adjoining building as a machine and repair shop, and general service works. Headquarters of the company are at Schenectady, N. Y.

R. A. Easterling, Denmark, S. C., and associates, are organizing a company to build and operate a hydroelectric power plant on the Edisto River. A site has been selected about four miles from the city. The new generating plant will be operated in conjunction with an existing steam-operated station at Denmark.

A vocational department will be installed in the new southwest junior high school to be erected at Gwynn's Fall Park, Baltimore, estimated to cost in excess of $500,000. Smith & May, Calvert Building, are architects.

The Lavale Light & Power Co., Lavale, Md., recently organized, has acquired the local power plant of the Lavale Milling Co., now in receivership, and plans for immediate enlargement, to include the installation of new generating and other machinery. It is headed by M. S. Berkley and Ezra Deal, both of Lavale.

The office of the Chief of Engineers, United States Army, Washington, will take bids until Aug. 1, for 10 Diesel engine generating sets, each 90 kw., 125 volts and switchboards; also for four motor-driven air compressors.

The Sandhill Power Co., Carthage, N. C., is planning for the construction of a new steam-driven electric power plant in the vicinity of the property of the Carolina Coal Co., to be used as an auxiliary to the present hydroelectric power station. It is estimated to cost in excess of $100,000. John R. McQueen is president.

The Board of Public Works, Baltimore, will build a one-story service and repair plant, 32 x 100 ft., at Cedar Avenue and Twenty-fourth Street, for automobiles and motorcycles used by the Police Department. A machine repair department will be provided. It will cost about $25,000.

The Hackley Morrison Co., 16½ North Ninth Street, Richmond, Va., machinery dealer, is making inquiries for a number of electric generators, with exciters, base, switchboard, etc.

Electric motors, controlling devices, conveying machinery and other mechanical equipment will be installed in the new four-story printing plant, 90 x 140 ft., to be erected by the News-Leader Publishing Co., 9 North Eighth Street, Richmond, Va., estimated to cost about $300,000. Baskerville & Lambert, Travelers' Building, architects, are taking bids.

The Gulf States

BIRMINGHAM, July 17.

The United States Machine Shop, Box 424, Electra, Tex., recently organized, has acquired a local building and plans the installation of equipment for a forge and machine shop for the production of oil-well equipment and supplies. C. A. Lininger is secretary, treasurer and general manager.

The Texas Power & Light Co., Waco, Tex., is disposing of a bond issue of $2,000,000, a portion of the proceeds to be used for extensions and improvements in power plants and system. A. S. Grenier is vice-president.

The Consumers Light & Power Co., New Orleans, will commence the immediate erection of a new power plant.

The Standard Oil Co. of Louisiana, New Orleans, is perfecting plans for the installation of new pipe lines, pumping plants and auxiliary equipment, to provide for an additional handling capacity of 75,000 gallons of oil per day, estimated to cost close to $5,000,000.

The Tucker Motor Co., Tuscaloosa, Ala., has leased a new building to be erected on Sixth Street, for the establishment of a service works, with machine repair shop. It is estimated to cost close to $50,000.

The Florida Veneer & Crate Co., Brooksville, Fla., recently organized, has acquired a local building and will install machinery to manufacture crates, boxes, etc., estimated to cost about $22,000. J. K. Coogler is treasurer in charge.

The Honey Creek Minerals Co., Llano, Tex., operating molybdenite ore properties, has plans under way for the erection of a new refinery and laboratory, estimated to cost about $150,000, including machinery. It will also install a quantity of machinery at its local mines, to cost about $100,000.

The Bristow Refining Co., Cross Plains, Tex., has foundation work under way for its new oil refinery to have an initial capacity of about 500 bbl. per day. It will cost close to $100,000, including pipe line from the Pioneer oil fields.

The Consumers' Ice Co., Sulphur Springs, Fla., has plans in progress for a new branch ice-manufacturing plant at Nebraska Avenue and Broad Street, estimated to cost close to $45,000, including equipment. Clyde Perry is general manager.

Stringer Brothers, Gadsden, Ala., manufacturers of pipe, plumbing specialties, etc., have filed plans for a one-story building, 60 x 100 ft., and adjoining extension, 40 x 40 ft.

A vocational department will be installed in the three-story high school to be built at Beaumont, Tex., by the South Park Independent School District, estimated to cost

about $175,000. The R. H. Hunt Co., Dallas, Tex., is engineer and architect.

Price Brothers, Rotan, Tex., will build a new five-stand cotton ginning plant at Big Spring, Tex. A site has been acquired at East Second and Benton streets. C. E. Lytle is manager.

Ryan & Knight, Inc., Miami, Fla., will commence the immediate erection of a new three-story automobile service building, 90 x 110 ft., with machine shop and repair department, estimated to cost about $90,000.

The Atlantic Coast Line Railway Co., Wilmington, N. C., has tentative plans for rebuilding the portion of its car and locomotive shops at Montgomery, Ala., including machine shops, car repair building, mill room and engine house, recently destroyed by fire with loss estimated at about $200,000.

A vocational department will be installed in the new high school to be erected at Port Arthur, Tex., estimated to cost about $200,000.

The Lee Lumber Co., Tioga, La., has plans nearing completion for rebuilding its sawmill, recently destroyed by fire with loss of about $100,000. The new plant will have a daily capacity of about 70,000 sq. ft.

The City Council, Kaufman, Tex., has tentative plans under consideration for the construction of a municipal electric power plant, with local distributing system. Estimates of cost of equipment will be secured at once.

The Clayton Refining Co., Dallas, Tex., has work under way on remodeling and improving the refinery of the Hercules Refining Co., West Dallas, recently acquired. The work, including equipment, will cost close to $50,000.

The Alabama Concrete Pipe & Mfg. Co., Birmingham, recently organized, has taken over the local plant of the Southern Bridge Co., for the production of concrete pipe specialties. J. C. Griffin is president, and W. C. Austin, secretary and treasurer.

The Central South

ST. LOUIS, July 17.

The White Co., Firestone Building, Kansas City, Mo., manufacturer of motor trucks with plant at Cleveland, has awarded contract to the George M. Bliss Construction Co., 508 Lathrop Building, for a two-story and basement service and repair building, 100 x 250 ft., at Twenty-eighth and Walnut streets, estimated to cost about $100,000. M. A. O'Mara is local manager.

The Service Machine Shop, Henryetta, Okla., has tentative plans for rebuilding the portion of its plant destroyed by fire July 6, with loss reported at $20,000.

The Tulsa Stove & Foundry Co., San Springs, Okla., has awarded contract to the Tulsa Structural Steel Co., Tulsa, Okla., for a one-story addition, 80 x 290 ft., for the manufacture of oil field pumps, engines, parts, etc. It is estimated to cost about $180,000, including equipment, which will include a number of traveling cranes and electrically-driven tools. A. C. Spitznagel is head.

Fire, July 5 destroyed the planing mill of J. C. Winn, Muskogee, Okla., with loss estimated at about $45,000, including equipment. It is planned to rebuild.

The Constantin Refining Co., Tulsa, Okla., is disposing of a bond issue of $720,000, a portion of the proceeds to be used for extensions and improvements.

The Wilhoit Refining Co., Joplin, Mo., is planning for extensions and improvements in its refinery, including the installation of new equipment, estimated to cost about $75,000.

The Empire District Electric Co., Joplin, Mo., operated by the Cities Service Co., 60 Wall Street, New York, is planning for an addition to its generating plant, to include the installation of a 10,000 kw. generator and auxiliary machinery.

A vocational department will be installed in the new high school to be erected at Wichita, Kan., three stories and basement, estimated to cost about $1,000,000, for which bids are being asked until July 31. Lorentz Schmidt & Co., 121 North Market Street, are architects.

The Oklahoma Public Service Co., Mayo Building, Tulsa, Okla., is perfecting plans for an addition to its electric generating plant, estimated to cost about $1,000,000, including machinery. Sargent & Lundy, 72 West Adams Street, Chicago, are engineers.

The Goodwin-Fields Motor Car Co., 250 East Main Street, Lexington, Ky., will commence the immediate erection of a one-story and basement service and repair building, 100 x 200 ft., on Main Street, estimated to cost about $60,000. The Frankel, Curtis Co., Ben Ali Theater Building, is architect.

The Arkansas-Missouri Power Co., Blytheville, Ark., has been granted permission to issue bonds for $652,000, a portion of the proceeds to be used for extensions and improvements in power plants and system. The company is concluding negotiations for the purchase of the property of the Missouri-Southeastern Utilities Co., and the Caruthersville-Kennett Light & Power Co., and will make extensions in these plants.

The Osage Battery Co., Tulsa, Okla., has preliminary plans for the erection of a local factory, estimated to cost in excess of $75,000.

The Joplin Supply Co., Joplin, Mo., has awarded contract to the C. A. Dieter Construction Co., Joplin, for a five-story and basement automobile service and repair works, 75 x 120 ft., estimated to cost about $200,000, including equipment. Smith & Van Pelt, Frisco Building, are architects.

The Atchison, Topeka & Santa Fe Railroad, 80 East Jackson Boulevard, Chicago, will soon break ground for its new boiler and tank shops at Albuquerque, N. M., estimated to cost about $500,000, including equipment.

A vocational department will be installed in the two-story and basement high school, 70 x 122 ft., to be erected at Kingfisher, Okla., estimated to cost close to $100,000. Monnot & Reid, 409 Empire Building, Oklahoma City, Okla., are architects.

Eisele & Co., Nashville, Tenn., manufacturer of surgical instruments and similar equipment, have leased a local building for the establishment of a new plant. A list of equipment for installation is being arranged, to include automatic screw machines, hand-operated screw machines, punches, presses, etc., as well as a quantity of special machinery. An electro-plating department will be established. Logan Eisele is president.

The Apco Refining Co., Colcord Building, Oklahoma City, Okla., recently organized with a capital of $100,000, has plans under way for a new oil refinery with initial output of about 750 bbl. per day. It will cost in excess of $50,000.

The Pacific Coast

SAN FRANCISCO, July 11.

Henry Olson, Seventeenth and Santee streets, Los Angeles, will soon commence the erection of a new one-story machine shop, 100 x 150 ft. A. G. Bailey, 3429 Lanfranco Street, is architect.

The Berkeley School District, Berkeley, Cal., will build a one-story machine and mechanical shop at the Burbank School, estimated to cost about $20,000.

The Illinois Electric Co., Los Angeles, manufacturer of electrical specialties, is completing plans for a new four-story building, 50 x 137 ft., at Boyd and San Pedro streets, estimated to cost about $65,000. Noerenberg & Johnson, 401 Los Angeles Railway Building, are architects.

The Shell Oil Co., 343 Sansome Street, San Francisco, has plans nearing completion for a new oil distributing plant at Yuba City, Cal., estimated to cost about $35,000.

The San Joaquin Light & Power Corporation, Fresno, Cal., will build an addition, 48 x 110 ft., to its power house at California and Orange avenues, estimated to cost about $100,000.

The Oil Tool Service Mfg. Co., Anaheim, Cal., has filed plans for the erection of a new one-story building to be equipped as a machine shop and foundry. It will cost about $25,000. B. D. McAlvay is president.

The Central Mendocino County Power Co., Willits, Cal., has made application for permission to issue stock for $200,000, the proceeds to be used for a new power plant and local distributing system.

Nathaniel Baldwin, Salt Lake City, Utah, operating a plant to manufacture wireless receivers and other radio specialties, has organized a company to be known as Nathaniel Baldwin, Inc., capitalized at $1,000,000, to provide for general expansion in operations. It will enlarge its facilities for receiver and amplifier production. David Neff will be vice-president and treasurer, and Lawrence Clayton, secretary.

The Board of Education, Los Angeles, will soon commence the erection of a new one-story shop building at the Jefferson High School, estimated to cost $50,000.

The Western Iron-Ite Sash Weight Co., Los Angeles, recently organized to manufacture sash weights, has established a plant at 2448 East Eleventh Street. In addition to regular iron sash weights, it will produce a concrete sash weight, under rights granted by the Concrete Sash Weight Co. George W. Roberts and Alexander R. White head the company.

The Hubbard Machine Co., 615 Howard Street, San Francisco, manufacturer of pumping machinery, has leased a new building, one-story, 50 x 165 ft., now in course of erection, for a new works.

The Washington Iron Works, Seattle Boulevard and Nor-

man Street, Seattle, Wash., has plans nearing completion for the erection of the following buildings: Foundry, one-story, 130 x 450 ft., for the production of steel and grey iron castings; machine and erecting shop, one-story, 120 x 570 ft.; boiler and plate shop, one-story, 80 x 570 ft.; pattern shop, five stories, totaling about 50,000 sq. ft. of floor area; iron-working shop, one-story, 50 x 110 ft.; carpenter and wood-working shop, one-story, 50 x 100 ft.; store house, 60 x 200 ft.; power plant, 50 x 110 ft.; and three-story office. The structures will be of steel and concrete and are estimated to cost about $500,000, including machinery. Richard E. Ellis is company engineer; Gerald Fink is president.

The Oregon Pulp & Paper Co., Salem, Ore., has plans nearing completion for additional machinery to increase the capacity about one-third. The expansion is estimated to cost about $200,000.

The Foster Lumber Co., Dallas, Ore., is considering plans for rebuilding the portion of its mill recently destroyed by fire with loss estimated at about $100,000, including machinery.

Fire, July 5, destroyed a large portion of the mill of the Murphy Timber Co., Portland, Ore., with loss estimated at about $250,000. It was operated throughout with electric drive. It is proposed to rebuild at an early date. Edward Murphy is president.

Canada

TORONTO, July 17.

ORDERS for one or two machines still continue to predominate in this market. Automotive plants are buying in a limited way for replacement purposes, but some good orders are expected from this source later, as a number of manufacturing plants are under construction for which equipment will be required. The Durant Motors, Ltd., Toronto, is about to start work on an addition for the manufacture of the Star car, the new building to be completed and in operation by next spring. Woodworking equipment is in fair demand and some good orders having recently been closed for the line. Inquiries from various parts of the Dominion are coming in for equipment for diversified lines of manufacture and dealers are of the opinion that if only a small portion of this prospective business results in actual sales the year will show a decided improvement over that of 1921. Dealers are experiencing a steady call for most lines of small tools and buyers are ordering in larger quantities. Prices are holding firm.

Wallace R. Campbell, vice-president and treasurer Ford Motor Co. of Canada, Ltd., has announced that his company will soon begin the erection of a large motor car plant immediately adjacent to the works at Ford City, Ont. It will cover approximately 125 acres and will cost in the neighborhood of $6,000,000. For several weeks it has been known that big developments were to be looked for at Ford City, but official announcement was postponed until the real estate was actually secured. This has been purchased at a cost of approximately $1,000,000 and definite plans for the works are being prepared. It is expected that the production of the Canadian Ford will be doubled immediately the new plant is in operation and the plans are to turn out 500 cars a day. This, however, will not represent the entire capacity, as the plans will allow a production of 1000 cars per day as soon as the market warrants the output. The new property extends for 2000 ft. along the river front. The buildings will all be one story, with daylight roofs. The present plant will gradually cease to operate as a motor car factory, following the completion of the new buildings, and will eventually be devoted to the manufacture of car bodies, a line of manufacture not now carried on by the Ford company here.

The Windsor Steam Motors, a branch of the Trask Detroit Steamer Co., is arranging for the erection of a manufacturing plant at Windsor, Ont. Until the Windsor plant is ready for operation it is the intention of the company to take care of the Canadian trade from the Detroit plant.

The Charles A. Strelinger Co., Windsor, Ont., has secured one-half of the contract for machine tools let by the Sarnia Board of Education for the new technical school and collegiate institute. The order consists of five lathes, two gas furnaces, one electric furnace, torch-weld equipment, grinder and anvil.

The Toronto Board of Control has awarded contract for a 4,000,000-gal. centrifugal pump for the Island pumping station to the John Inglis Co., Strachan Avenue, Toronto, whose price was some $300 lower than that of the lowest United States bidder.

The Peninsula Cord Tire Co., 45 John Street South, Hamilton, Ont., is arranging for the erection of a local manufacturing plant.

The general contract for a paper mill for the Westminster Paper Mills, Ltd., New Westminster, B. C., has been awarded to the Dominion Construction Co., 509 Richards Street, Vancouver, B. C.

The Ideal Iron Works, 123 Powell Street, Vancouver, B. C., will build a machine shop and has awarded the general contract to the James Layfield Contracting Co., 2763 Cambridge Street, Vancouver.

The towns of Enderby, B. C., will build an electric light plant to cost $23,000, for which bids will soon be called.

The Durant Motors of Canada, Ltd., Royal Bank Building, Toronto, will receive bids, no closing date set, for an addition to its plant at Leaside, Ont., to cost $500,000. Plans are with E. A. Walberg, 909 Royal Bank Building, Toronto

Indiana

INDIANAPOLIS, July 17.

Bids are being asked by the Board of School Trustees, Fort Wayne, Ind., until July 24, for the erection of a new vocational training school, plans and specifications for which have been prepared by the Austin Co., 208 South LaSalle Street, Chicago. Bids for machinery and equipment will be asked in the near future. Henry J. Bowerfind is secretary of the board.

The Olin-Wilmeth Co., Inc., 515 North Meridian Street, Indianapolis, formerly known as the Olin Sales Co., will commence the erection of a new three-story automobile service and repair building, 59 x 195 ft., at 720-22 North Meridian Street, estimated to cost about $150,000. Roy F. Wilmeth is secretary and treasurer.

A power plant will be erected in connection with the new State reformatory to be built at Pendleton, Ind., at a cost of about $3,000,000. Plans are being completed by Herbert Foltz, Indianapolis, architect for the Special Reformatory Committee, State House, Indianapolis.

The Hercules Corporation, Evansville, Ind., has discontinued the manufacture of automobiles and parts, and subsidiaries of the company devoted to this line have been dissolved, including the Hercules Tractor Co., Hercules Body Mfg. Co., Hercules Wheel Co., Hercules Buggy Co. and the Hercules Engine Co.

William S. Baerich, Evansville, Ind., and associates, have acquired the uncompleted plant of the Stronghold Tire & Rubber Co. from the receiver. The new owner is said to be planning the organization of a new company to complete the erection, install machinery and operate the plant.

The Merchants Light, Heat & Power Co., Indianapolis, has leased a one-story building, 60 x 160 ft., at 305 North Senate Avenue, for a service and repair works for company trucks and cars.

The City Council, Michigan City, Ind., has tentative plans under way for rebuilding the pumping plant at the waterworks, destroyed by fire July 6, with loss estimated at close to $500,000, including machinery.

The Acme Works, Inc., 420 South Harding Street, Indianapolis, manufacturer of castings, etc., is planning for the installation of new equipment, including metal and wood pattern-making apparatus. Peter Lambertous is president.

A vocational department will be installed in the new two-story and basement high school at Martinsville, Ind. D. A. Bohlen & Son, 1001 Majestic Building, Indianapolis, are architects.

Fire at the plant of the Louisville Cement Co., Speeds, Ind., July 13, caused a loss estimated at $300,000, principally to the building manufacturing brickment and containing considerable machinery. A boiler-house supplying power was included in the loss. The entire plant of the company is valued at $2,000,000.

Lackawanna Steel Deficit Reduced

In the quarterly report of the Lackawanna Steel Co., which covers the three months ending with June, giving a comparative statement of the income account over the same period last year, a deficit of $172,880 is shown against $983,127, the second quarter deficit for 1921. Total net earnings of all properties after deducting taxes and other expenses were $457,303, against a net loss a year ago of $384,762.

For the first six months there was a deficit of $652,852, as against $974,392 for the first half of 1921. Net earnings over this period, before deducting charges, totaled $659,713, whereas last year they reached only $282,933. Interest charges for this period were $528,742, compared with $518,929 for 1921. Depreciation and accruing renewals amounted to $783,823, compared with $738,396.

American Car & Foundry Report

The American Car & Foundry Co. in its report for the fiscal year ended April 30, 1922, shows surplus of $4,483,320 after charges, federal taxes and preferred dividends equal to $14.94 a share earned on the $30,000,000 common stock. This compares with surplus of $6,450,856, or $21.50 a share in the previous year.

W. H. Woodin, president, says:

"The company began its year with thoroughly liquidated inventory of slightly over $14,000,000—less than was needed for the business then on books. During the year orders for new equipment have come fitfully rather than in a steady flow. The market, in the main, has been a 'buyers' market,' and the railroads have been able to get their requirements at prices which have made possible a profit to the manufacturer only by the combination of a high degree of efficiency in production with the utmost economy in operation and material-purchases. The company closed its year with an inventory of less than $10,000,000 and with a volume of new business on its books substantially in excess of that with which the year began.

"The railroads are slowly recovering from war-time conditions and effects of governmental control and operation. Rates they may charge for their service and wages they shall pay for labor are questions still in process of solution. Until these two great questions are settled, obviously the roads can with safety do no more than attempt to meet their immediate and absolute necessities in the rehabilitation of their properties. That they are lacking the facilities of transportation necessary for their requirements and for the proper handling of the country's traffic when industry and commerce shall return to normal conditions, cannot be doubted.

"The situation with respect to foreign business is not different in any marked degree from that of a year ago. While the company during the year has sold some equipment to other than domestic buyers, the management has not felt that conditions with respect to foreign credits have been such as to warrant the company in contracting for the sale of its products abroad unless payment were definitely and amply assured.

"Condition of the company is in all ways healthy and satisfactory. It has not been necessary during the year to draw to any appreciable extent upon any of the reserves.

"The company is fortunate in having a wide diversity of product which enables it to do a large and generally profitable business in the sale of miscellaneous articles and supplies."

Industrial Finances

The recent increase in the capital stock of the Doehler Die-Casting Co., Brooklyn, was for the purpose of possible future requirements rather than for any additions in the immediate future.

Pittsburgh Steel Co. has declared the usual quarterly dividend of $1.75 on the preferred stock, payable Sept. 1.

Elmer E. Mitchell, Wilmington, Del., has been appointed ancillary receiver of the Premier Motor Corporation, Indianapolis, the concern being a Delaware corporation. The petitioner is the American Foundry Co., Indianapolis, one of the creditors. The Fletcher Savings and Trust Co., Indianapolis, is receiver for the Premier Corporation, the foundry company being also petitioner there. The suits are friendly and in behalf of a reorganization of the corporation.

The Superior Court at Indianapolis has approved the sale of the Midwest Engine Co., of Indiana, that city, to the reorganization committee for a price said to be in excess of $2,000,000. The bid on which the sale was made was by Benjamin F. Castle, New York, secretary pro tem. for the reorganization committee, of which the members are: Lewis E. Pierson and L. C. Ansmann, Cincinnati; Charles F. Mills, Boston, and Elmer W. Stout and Homer McKee, Indianapolis. The reorganized company will be known as the Midwest Engine Corporation.

Listing of stock of the Brier Hill Steel Co., Youngstown, Ohio, and the Trumbull Steel Co., Warren, Ohio, on the New York stock exchange is being given consideration by important interests in both companies.

Boston and Chicago banking interests have purchased and resold an issue of $5,000,000 Crane Co., Chicago, 7 per cent cumulative preferred stock. Funds derived from the sale of this stock will be used largely as additional working capital.

Boston heavy hardware jobbing interests have been notified that the Champion Horseshoe Co., Pawtucket, R. I., has been acquired by the Phoenix Horse Shoe Co., Poughkeepsie, but is being operated under its old name. Further details are lacking.

Trade Changes

Joseph W. Jones, manufacturer of electric drills, gages, etc., has arranged with C. K. Turner & Son, 116 Broad Street, to act as his representative in the foreign market.

The Mesta Machine Co., Pittsburgh, announces the removal of its Chicago office from the McCormick Building to the Peoples' Gas Building. C. J. Mesta, second vice-president, who has been in charge of the Chicago office for over a year, has returned to the home office in Pittsburgh to take charge of the sales department. A. B. Neumann, mechanical engineer, has been appointed manager of the Chicago office. Mr. Neumann has been in the Chicago district for a number of years in the capacity of chief engineer and consulting engineer for several of the largest steel plants in that district.

A. C. Haberkorn, former Detroit branch manager, Manning Maxwell & Moore, Inc. and Biggs-Watterson Co. and E. E. Wood, former sales manager Jones & Lamson Machine Co., have formed a partnership under the name of Haberkorn & Wood, and have opened an office and warehouse at 620 E. Hancock Ave., intending to handle a line of machine tools, cutting oils and compounds, also permanent mould aluminum alloy castings.

E. V. Swangren, former vice-president and superintendent F. J. Littell Machine Co., Chicago, and W. N. Stevenson, former secretary and chief engineer of the same company, announce the formation of a partnership. The firm will be known as the S & S Machine Works, 4522 Lexington Street, Chicago.

Edward C. Dilworth, until recently manager of sales Pittsburgh-Des Moines Steel Co., Pittsburgh, who also had a broad experience in the structural steel business while affiliated with the American Bridge Co., has opened offices at 302 Wabash building, Pittsburgh, as a consulting engineer on all kinds of structural projects.

An arangement has been consummated between The Bastian Blessing Co., Chicago, manufacturer of Rego welding and cutting apparatus and the St. Paul Welding & Mfg. Co., manufacturer of the Torit welding and cutting equipment by which the Bastian Blessing Co.. has taken over the entire stock of the St. Paul Welding & Mfg. Co.'s line of soldering equipment, trucks, preheaters and acetylene generators. The latter company on the other hand, will be the service distributor of Rego welding and cutting equipment throughout the Northwest. It will carry a complete stock of welding and cutting equipment and supplies and operate a repair service station at St. Paul, Minn.

The Barnes Foundry Co. announces the removal of its main office and sales room to 515 West 56th Street, New York. The foundry and machine shop are located at Freeland, Pa.

The Westinghouse Electric & Mfg. Co. has opened a new office in Richmond, Va., in room 503, Virginia Railway & Power Co. building, with W. O. Peale in charge.

H. S. Huncke, western sales manager Lumen Bearing Co., Buffalo, N. Y., at Chicago, has resigned and formed the firm H. S. Huncke & Co., with headquarters at 15 North Jefferson Street, Chicago, to deal in wrenches, pliers, portable drills, screw plates, taps, dies, portable bench hack saw machines and welded steel shop equipment.

Plans of New Companies

The McLaughlin Radio & Electrical Corporation, Equitable Building, Baltimore, recently incorporated, will have its work done by contract for the present. The company is, however, looking toward the erection and equipment of a thoroughly modern plant.

The Wireless Mfg. Co., Canton, Ohio, recently incorporated, will conduct principally a distributors' business, handling other manufacturers' products in a wholesale way, but it will market certain items of its own manufacture, at present principally transmitting inductances and a complete line of variable condensers to be put out under the trade name of Wimco.

The Furnace Fan Corporation, Dowagiac, Mich., will manufacture a small mechanical fan system called a furnace fan. The company contemplates taking over a plant now in Dowagiac, which has a complete foundry and machine shop equipment and will manufacture the entire unit in its plant.

The Aluminum Die-Casting Corporation has moved from 87 Thirty-fifth Street, Brooklyn, to Garwood, N. J.

NEW TRADE PUBLICATIONS

Amperehour Meters.—Sangamo Electric Co., Springfield, Ill. Bulletin No. 58 describes the Sangamo "locomotive type" amperehour meter, which when installed permanently in the storage battery circuit on a truck, tractor or mine locomotive, registers every amperehour which the battery discharges in driving the vehicle. Since the total battery capacity is indicated by a red "empty" hand on the meter, the black hand indicates the remaining capacity left in the battery. When the battery is subsequently put on charge, the amperehour meter registers as the charge proceeds, operating in the reverse direction from that of the discharge. The booklet describes the principles of operation, and is illustrated with photographic reproductions and drawings.

Oil Control Pump.—The Oilgear Co., 60 Twenty-seventh Street, Milwaukee. Bulletin No. 6 describes the Oilgear control pump, designed to pump oil under pressure with instantly variable delivery from zero to maximum in either direction. A single operating handle controls the machine, giving desired rates of delivery, and stopping or reversing the flow. It can be connected to any machine or device requiring oil under pressure.

Motor Generator Sets.—Ideal Electric & Mfg. Co., Mansfield, Ohio. Bulletin No. 106 illustrates and describes the company's line of motor generator sets, giving names of some of the prominent users of this equipment.

Electro-Plating Apparatus.—Ideal Electric & Mfg. Co., Mansfield, Ohio. Bulletin No. 107 describes the company's line of electro-plating apparatus, which ranges from 50 to 7500 amperes.

Pyrometers.—Wilson-Maeulen Co., Inc., New York. Catalog No. 14, 20 pages. Illustrated description of the various instruments and recorders.

Ferroalloys and Metals.—A 26-page pamphlet giving the composition and uses of about 28 products of the "Electromet Brand" of ferroalloys and special alloys and metals put on the market by the Electro Metallurgical Co., 30 East Forty-second Street, New York.

Carbon Dioxide Recorders.—Uehling Instrument Co., Paterson, N. J. Bulletin 112, 12 pages, 6 by 9 in. Describes and illustrates single, two, three and four unit CO_2 meters and also a multiple unit which is for the office of the chief engineer, providing the means for measuring CO_2 from two to six boilers, independently and simultaneously. Type M gages operating on the hydrostatic principle are described and also type Z auxiliary boiler front indicator. The "Pyro-porus" filter for keeping the gas sampling lines clean is given space.

Boiler Installations for Textile Mills.—A 32-page heavily illustrated booklet issued by the Heine Boiler Co., St. Louis, devoted largely to illustrations of installations. Technical matters are handled, particularly the relation between boiler efficiency and flue gas temperature for different percentages of CO_2. A table is given of the properties and calorific values of fuels drawn from many localities all over the United States.

The Weather Vein.—A 32-page pamphlet issued by the Carrier Engineering Corporation, Newark, N. J. This is devoted to the question of humidity in the air in manufacturing and other buildings and means by which that humidity may be controlled.

Forty Years of Progress.—An eight-page leaflet announcing the change of name of the Heine Safety Boiler Co. to the Heine Boiler Co., St. Louis. The boiler was first called a safety boiler because, being of the watertube type, there was only a small volume of high temperature water in it, thus minimizing the danger of explosions.

Micarta Gears.—Westinghouse Electric & Mfg. Co., East Pittsburgh. Circular 1579-B, containing general and technical data on Micarta, a non-metallic material for gear and pinion application, developed by the Westinghouse company. It is a laminated product of specially treated woven fabric of homogeneous structure and physical properties are claimed for it that make possible its substitution for untreated steel, cast iron, bronze and other materials used in gear manufacture. It is self-sustaining and may be machined with ordinary standard tools and equipment. It was developed primarily to provide a silent gear drive.

Vises.—Athol Machine & Foundry Co., Athol, Mass. A 40-page booklet, recently published by this company illustrates and gives specifications of their various types of vises, as well as grindstone frames and bench grinders.

Steel Wheels and Derricks.—Marion Machine, Foundry & Supply Co., Marion, Ind. Bulletins 530 and 535, devoted to steel turnbuckle derricks and steel band wheels. Parts of the derricks are shown and line drawings give measurements and proportions. The steel band wheels and steel tug rims are described briefly in bulletin 535.

Foundry and Pattern Shop Supplies.—The Kindt-Collins Co., Cleveland. Catalog F, listing and illustrating pattern shop supplies and equipment, chaplets and snap flasks. Included are also crucible furnace blowers, blow torches and pattern shop woodworking machinery.

Valves.—Buckeye Iron & Brass Works, Dayton, Ohio. Catalogue of 159 pages, bound in cloth. This is the utilitarian type of book, of convenience to the purchasing agent and to the engineering or designing department, profusely illustrated with the types of valves and incidental specialties made by the company in both brass and iron and accompanied where necessary with sectional drawings. A noteworthy feature is an index for finding the particulars of valves by figure number. The brass section covers over 100 pages and illustrates valves under fifteen general classifications. Most of the remainder of the book is given over to the iron body valves, of which there are fourteen different general types, including blow-off valves and butterfly, throttle, safety and whistle valves. A few pages show the Government valves the company is prepared to make and fourteen or fifteen pages are devoted to data and information, such as the proportionate weight of castings to wood patterns, the shrinkage of patterns for different metal castings and tap drill sizes for threads.

Hoevel Sandblast Machines.—Hoevel Mfg. Corporation, Jersey City, N. J., 1922 catalog, 24 pages, describing and illustrating sand blasting machines and equipment, covering Hoevel revolving barrel, rotary table, cabinet, room and portable types.

Preparing Flue for Analysis.—Four-page illustrated leaflet by the Uehling Instrument Co., Paterson, N. J., patentee and manufacturer of the Pyro-porus gas filter, describes apparatus for excluding dust and dirt from gas sampling line.

Heat Treatment Furnaces.—Bulletin 242, W. S. Rockwell Co., 50 Church Street, New York, 16 pages, 8½ x 11 in., illustrates and describes the practical application of many types of heat treating furnaces. The bulletin includes also a discussion on the influence of method of heating and handling on quality and cost of heat treated products. There are 30 illustrations, mostly halftones.

Pioneer Acid-Resisting Alloys.—Pioneer Alloy Products Co., Inc., Cleveland—a 6-page leaflet giving the physical properties of Pioneer acid-resisting alloy and showing its use in an acid-resisting, quick-opening gate valve.

Low Pressure Air Gas Inspirator.—One of a series of bulletins published by the Surface Combustion Co., industrial furnaces, New York. Others are oven-furnaces, pot-hardening furnaces, soft metal furnaces, galvanizing baths, shipyard furnaces, rivet heaters, small forges and laboratory furnaces for high temperatures.

Industrial Lighting Briefs.—Cooper Hewitt Electric Co., Hoboken, N. J.—A series of bulletins containing digests and reviews of articles on the theory and practice of industrial lighting. Additional numbers to be published from time to time will deal with important phases of the subject in such a way that engineers interested in industrial lighting will be able to use them to advantage.

Coal Pulverizer.—Bannot Co., Canton, Ohio. A 12-page illustrated bulletin, 8 in. x 11 in., showing the uses, design and construction of the Bannot pulverizer, air separator and exhauster for powdered coal burning installations.

Heating Specialties.—Fulton Co., Knoxville, Tenn. Catalog No. 100, 144 pages, 3¾ in. x 6¾ in., illustrates and describes sylphon heating devices and thermostatic equipment manufactured by the company, there being in addition 26 pages of tabular matter relating to properties of steam, relative humidity, specific heats, pressure equivalents, temperature conversion, pipe dimensions, etc.

Positive Pressure Blowers.—Connersville Blower Co., Connersville, Ind. Bulletin No. 21, 4 pages, 8½ in. x 11 in. Illustrates and describes the Victor line of small blowers (capacities 40 to 275 cu. ft. of free air per min. at pressures of 1 to 5 lb.).

Malleable Nickel.—American Nickel Corporation, Clearfield, Pa. A 12-page bulletin, 8½ in. x 11 in., giving a resumé of the properties and uses of pure nickel, shown by graphs and tabular comparisons.

For Hoist Efficiency.—The Wright Mfg. Co., Lisbon, Ohio. A 16-page illustrated booklet, two colors, giving capacities, details and prices of Wright hoists.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

	Per Lb.
Bars:	
Refined iron bars, base price	2.58c.
Swedish bars, base price	7.00c.
Soft steel bars, base price	2.58c.
Hoops, base price	3.63c.
Bands, base price	3.23c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	2.68c.
Channels, angles and tees under 3 in. x ¼ in., base	2.58c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	2.60c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	2.80c.
Toe-calk, ½ x ⅝ in. and larger	3.40c.
Cold-rolled strip, soft and quarter hard	6.25c. to 7.25c.
Open-hearth spring steel	3.50c. to 6c.
Shafting and Screw Stock:	
Rounds	3.35c.
Squares, flats and hex	3.85c.
Standard cast steel, base price	12.00c.
Extra cast steel	17.00c.
Special cast steel	22.00c.

Tank Plates—Steel

¼ in. and heavier	2.68c.

Sheets

Blue Annealed	Per Lb.
No. 10	3.63c.
No. 12	3.68c.
No. 14	3.73c.
No. 16	3.83c.

Box Annealed—Black	Soft Steel C. R., One Pass, Per Lb.	Blued Stove Pipe Sheet, Per Lb.
Nos. 18 to 20	4.00c. to 4.30c.	.....
Nos. 22 and 24	4.05c. to 4.35c.	4.60c.
No. 26	4.10c. to 4.40c.	4.65c.
No. 28	4.20c. to 4.50c.	4.75c.
No. 30	4.45c. to 4.75c.	.....

No. 28 and lighter, 36 in. wide, 10c. higher.

Galvanized	Per Lb.
No. 14	4.30c. to 4.60c.
No. 16	4.45c. to 4.75c.
Nos. 18 and 20	4.60c. to 4.90c.
Nos. 22 and 24	4.75c. to 5.05c.
No. 26	4.90c. to 5.20c.
No. 27	5.05c. to 5.35c.
No. 28	5.20c. to 5.50c.
No. 30	5.70c. to 6.00c.

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.
⅛ in. Butt..	—56	—40
¼ in. Butt..	—61	—47
1-3 in. Butt..	—63	—49
3½-6 in. Lap.	—60	—46
7-8 in. Lap..	—56	—34
9-12 in. Lap.	—55	—33

Wrought Iron	Black	Galv.
¾ in. Butt..	—30	—13
1½ in. Butt..	—32	—15
2 in. Lap....	—27	—10
2½-6 in. Lap.	—30	—15
7-12 in. Lap..	—23	— 7

Steel Wire

Base Price* on No. 9 Gage and Coarser	Per Lb.
Bright basic	3.50c. to 3.75c.
Annealed soft	3.50c. to 3.75c.
Galvanized annealed	4.25c. to 4.50c.
Coppered basic	4.00c. to 4.25c.
Tinned soft Bessemer	5.50c. to 5.75c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	17¼c. to 18 c.
High brass wire	18¼c. to 18½c.
Brass rod	15¼c. to 16¼c.
Brass tube, brazed	24¼c. to 25 c.
Brass tube, seamless	20½c. to 21 c.
Copper tube, seamless	22¾c. to 24 c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 21¼c. to 22¼c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20
IC	$10.00	$8.50
IX	11.50	10.00
IXX	13.00	11.25
IXXX	14.25	12.50
IXXXX	16.00	14.00

Coke—14-20	Primes	Wasters
80 lb.	$6.05	$5.80
90 lb.	6.15	5.90
100 lb.	6.25	6.00
IC	6.40	6.15
IX	7.40	7.15
IXX	8.40	8.15
IXXX	9.40	9.15
IXXXX	10.40	10.15

Terne Plates

8-lb. coating, 14 x 20

100 lb.	$7.00
IC	7.25
IX	7.50
Fire door stock	9.00

Tin

Straits, pig	33½c.
Bar	40c. to 44c.

Copper

Lake ingot	15¼c.
Electrolytic	15 c.
Casting	14¾c.

Spelter and Sheet Zinc

Western spelter	7c. to 7½c.
Sheet zinc, No. 9 base, casks	8½c. open 9c.

Lead and Solder*

American pig lead	6¾c. to 7c.
Bar lead	8c. to 8½c.
Solder, ½ and ½ guaranteed	25c.
No. 1 solder	23½c.
Refined solder	20¼c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	75c.
Commercial grade, per lb	35c.
Grade D, per lb	25c.

Antimony

Asiatic	6½c. to 7c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb. 25c. to 27c.

Old Metals

Dealers report business improved this week with values firm. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	11.75
Copper, heavy wire	11.25
Copper, light and bottoms	9.00
Brass, heavy	6.25
Brass, light	5.25
Heavy machine composition	8.50
No. 1 yellow brass turnings	6.50
No. 1 red brass or composition turnings	7.75
Lead, heavy	4.50
Lead, tea	3.25
Zinc	3.00

THE IRON AGE

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The Electric Furnace for the Foundry

Considerations in Choosing the Proper Unit for Making Steel Castings—Too Large Sizes Often Selected —Place of Acid and Basic Operations

BY CHARLES WELLMAN FRANCIS

THE advent of the electric furnace as a real commercial factor in the iron and steel industry for the past six to seven years has revotionized the foundry business far beyond expectations. It no longer remains to be proved that castings made by the electric furnace process are of a finer quality and at the same time cheaper than those made by any other method of melting. Metallurgists and electric furnace engineers throughout the country agree that there would be more of these units in operation were it not for the ever present prejudice against their initial cost, and prospective users of electric furnaces must suppress their reluctance in order to give this process a fair trial.

Probably the most outstanding question which confronts the prospective purchaser of an electric furnace is that of the proper size or tonnage capacity to be chosen. To many this may not seem a very difficult problem to settle, but we have but to look around us to see a number of failures due to the inability to cope with this phase of the situation successfully. The writer can cite several instances where installations have proved "white elephants" because of a lack of sufficient floor space to handle the output of the unit installed.

The 3-ton furnace has universally become the most popular size furnace for foundry use in making the average run of jobbing steel castings. Foundrymen have in some instances feared they would not have sufficient melting capacity and have installed one unit of 6 tons capacity, and have not realized their mistake until depressions in business appeared. Then they begin to realize that tapping a 3 or 4-ton heat from a 6-ton furnace once or twice a day is not good operating economy.

Another reason is that even though business be plentiful, most foundry superintendents try to clear the floor of work by the end of the day turn. Not having enough molds to take a full heat, they are obliged to undercharge the furnace, which requires longer proportionate time per heat, excess of power and electrode consumption, all tending generally to increase greatly the melting costs. Still further, should melting troubles be encountered, as is often the case, caused by broken electrodes, burning out of roofs, etc., a number of laborers must be kept after the end of the day turn to handle the heat. Often time and half time must be paid these men, which fact also adds considerably to the cost and is often sufficient to counterbalance all profits, to say nothing of causing labor dissatisfaction.

A large proportion of these difficulties can be eliminated by installing two units of 3 tons each, instead of one 6-ton unit, as it is an easy matter to time two electric furnace heats to be tapped at the same time, should the demand arise for a larger amount of metal than can be tapped from one furnace.

Another angle of this question to be considered in purchasing electric furnace equipment is the fact that the most reliable furnace builders have designed their furnaces so that they can be charged 25 to 50 per cent above capacity and can be operated continuously without overtaxing the installation in the least. The large electrical equipment companies have met their part of this situation by building furnace transformers to withstand a 40 deg. rise in temperature and carry 50 per cent or more overload for a period of 2 hr. continuous operation without endangering a transformer blowout.

When the molding foreman can so adjust his work as to keep a little ahead of the melting foreman, thus enabling the furnaces to operate under conditions which the writer has just outlined, then and there only can the foundry production closely approach 100 per cent and give minimum operating costs. The writer is well acquainted with one company in the Middle West which over a period of one month produced 13 to 14 6-ton heats of mild steel for castings from a rated 3-ton capacity furnace. Needless to say this company's operating

THE author of the accompanying article, on the basis of some years experience in electric furnace work, both as superintendent and metallurgist, proposes to discuss in a number of articles the practical phases of the use of the electric furnace in the foundry. With the present contribution as an introduction the articles are to cover:

Construction Features for Operating Economy.

Acid Furnace Practice.

Basic Furnace Practice.

Comparison of Costs of Acid and Basic Operations.

Electric Furnace Labor Problems.

costs were at a minimum for this period.

Electric power facilities must be looked into thoroughly when an electric furnace installation is contemplated. The author cannot emphasize this side of the problem too strongly. It has been only a few years since that central station engineers and foundrymen were at swords points continually, due largely, the writer feels, to the ignorance of each to the other's problems. This situation is gradually being relieved, each doing all in his power to meet the other half way. The power engineer's greatest problem seemed to be the unbalancing effect that electric furnace "surges" tend to produce on the power line, causing considerable complaint from other power consumers on the same line. These "surges" which occur on all furnaces are made easier by the proper reactance in the circuit, a problem which should be thoroughly investigated at the start.

The question of the use of acid or basic operation is a vital one, and the choice of one or the other is dependent on a large number of factors. If the furnace is to be used for the manufacture of alloy steel castings, then it is almost imperative to use basic refractories, for on a basic bottom only can rigid alloy specifications be met and controlled without considerable loss of alloys.

The output of the majority of electric steel foundries is castings made from mild steel for the ordinary run of machine and jobbing work. This specification usually averages 0.25 per cent carbon; 0.75 manganese, 0.30 silicon. It is the author's opinion that for this class of work the acid lined furnace is the most practical from a production standpoint as well as the standpoint of operating economy, due largely to the fact that little or no refining is necessary in this case. It is best to use a good grade of scrap, such as heavy axle turnings, boiler plate punchings, light plate scrap, light forging stock or light forge flashings. In other words, use any good basic shoveling scrap, for there is no economy in charging the furnace with cheap scrap high in phosphorus and sulphur, and utilizing an excess of electric power and electrodes and a number of basic slags to reduce the phosphorus and sulphur and reach the desired specifications.

The acid furnace is particularly adapted to light "snap" work in the foundry where clean and hot metal is essential. These heats can be poured into a big ladle and "shanked" off, as is done with cupola metal in the iron foundry. With the proper care in handling, the loss in floor scrap and "spills" is practically negligable in this case.

Some of the points in the foregoing paragraphs may appear to be somewhat off the subject, and while they are of a more practical operating nature, they best exemplify some of the reasons for the choice of acid or basic practice in the foundry. Other minor features of some importance might be added to what has been said above, which will have some bearing on the choice of an electric furnace, but it will be found that they are all more or less interwoven each with the other, and with what have been already mentioned.

TOOL MERGER COMPLETED

Consolidated Machine Tool Corporation Elects Officers and Takes Over Five Plants

The organization of the Consolidated Machine Tool Corporation, 17 East Forty-second Street, New York, has been completed with the formal transfer of plants to the new company and the election of officers.

W. H. Marshall, formerly president of the American Locomotive Co., becomes chairman of the board; C. K. Lassiter, formerly vice-president in charge of manufacturing of the American Locomotive Co., is president, and there are five vice-presidents, each of whom will have charge of a specific branch of the company's activities as follows: James J. Dale of the Dale Machinery Co., machine-tool dealer, which has been absorbed by the Consolidated Machine Tool Corporation, will be located at the company's executive offices in New York; A. H. Ingle of the Betts Machine Co., Rochester, N. Y., will have the management of the Betts plant; Harry W. Champion, formerly president of the Newton Machine Tool Works, Philadelphia, will continue in charge of that plant; H. W. Breckenridge, formerly president of the Colburn Machine Tool Co., Cleveland, will remain at the Colburn plant, and H. J. Bailey, who has been president of the Hilles & Jones Co., Wilmington, Del., will be manager there. F. D. Paine, who will be in charge of the plant of the Modern Tool Co., Erie, Pa., is a member of the board of directors, but not a vice-president.

All of the above-named officers are members of the board of directors, which includes also B. J. Baker of B. J. Baker & Co., bankers, Boston; Lawrence Chamberlain of Lawrence Chamberlain & Co., bankers, New York, and T. Allen Hilles, Wilmington, Del. R. R. Lassiter is secretary of the company.

The capital stock consists of $10,000,000 of 7 per cent preferred and 200,000 shares of common of no par value. There is also a bond issue of $3,600,000. The appraised value of the plants entering the new company is given as $7,455,000 and the average annual net earnings of the five companies for the period Jan. 1, 1916, to April 30, 1922, is given as $1,023,014.

For the present, at least, none of the agency arrangements of the five machine-tool manufacturing companies which have entered the new organization will be disturbed. The Dale Machinery Co., which has handled both in New York and Chicago lines of tools made by companies which are not a part of the new company, has turned over these agencies to the Consolidated Machine Tool Corporation, which will continue the work as a dealer conducted by the Dale organization. An office will be maintained in Philadelphia, in addition to those now in New York and Chicago, while plans for offices in other large cities are in abeyance.

Additional floor space is being taken by the corporation on the third floor of the National City Building, 17 East Forty-second Street, New York, which will provide about 5000 sq. ft. of floor including the offices which have been occupied for the past year by the Dale Machinery Co.

Speculation as to Location of North American Steel Offices

Now that the Department of Justice has officially approved the proposed merger of the Inland Steel Co., the Republic Iron & Steel Co., and the Midvale Steel & Ordnance Co., as well as the proposed Bethlehem-Lackawanna combination, there is considerable speculation as to where the general offices of the former are to be located. Although it has no plants in Pittsburgh, there is a possibility of that city being selected on account of its central location in relation to the several plants, located at Coatesville and Johnstown, Pa., Youngstown, Ohio, and in the Chicago district, these several points being within easy riding distance of Pittsburgh. The general offices of the constituent companies now are in Chicago, Youngstown, Ohio, and Philadelphia, but executive offices of both the Midvale and Republic companies are in New York. Youngstown is almost as central as Pittsburgh, but is hardly likely to be selected and Chicago in spite of the fact that it contains the Inland Steel Co., and some of the plants of the Republic Iron & Steel Co., it is believed has small chance of being chosen. It is probable that New York will get the offices, with Pittsburgh a second choice.

IMPROVES MILLING MACHINE

Rockford Company Develops New Feed Transmission—Attachments Added—Other Features

A LITTLE over a year ago the Rockford Milling Machine Co., Rockford, Ill., put on the market a No. 3 high-power, single-pulley drive milling machine, embodying several new features, notable among which was a method of transmitting the feed drive to the knee, saddle and table, which eliminated the use of a telescopic feed shaft and universal joints. This machine was described in THE IRON AGE of April 21, 1921, page 1039. In that design the feed-reverse and quick-return gears were located in a box which projected from the right-hand side of the column; a drive shaft extended from the bottom of the box to a second gear box located at the base of the machine; from the latter box a splined shaft connected through a pair of bevel gears with the drive shafts in the knee.

The company has now gone a step further and has eliminated the employment of drive shafts in conveying power to the knee. The transmission is all inclosed in the knee casting which projects on the right hand side of the column, bearing on a wide face, which also had been provided in the previous machine. A long gear in vertical position is located in the part of transmission housing which fits over the face on the side of the column, and throughout the range of the movement of the knee is always in mesh with the feed-reverse and quick-return gears, which in the new design are located inside of the column directly behind the plane of the face. The long gear connects through a pair of bevel gears with a second long gear in horizontal position on the side of the knee, which meshes with the gears operating the knee, saddle and table. Thus it is to be noted that the feed drive throughout is through gears always in mesh and that there are no connecting shafts.

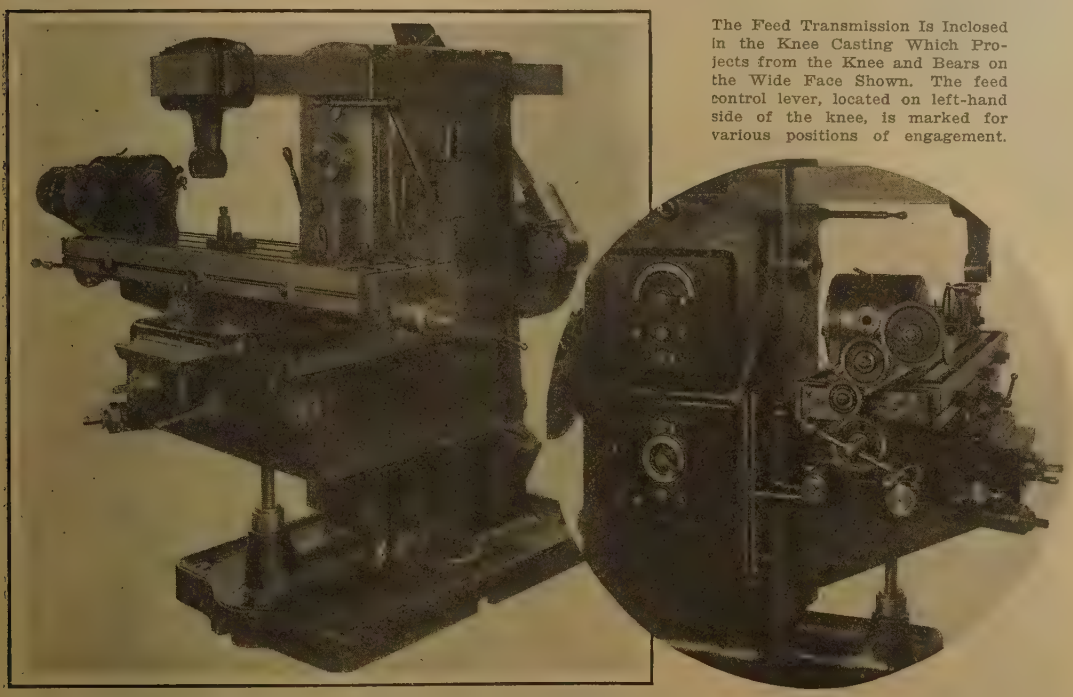
A friction adjustment has been provided on the horizontal long gear and serves to release the feed drive in case of accident or carelessness. This is accomplished through a friction clutch with double points of contact through fiber washers set at each end of the gear. Graduations have been provided on a collar at one end, so that the friction can be set to break for a predetermined pressure.

Another change is in the feed-control lever, which determines whether the transverse or vertical feed is being engaged. This is located, as in the older design, on the left-hand side of the knee, but has been provided with a dial marked with the two positions of engagement, i. e., "transverse" and "vertical," as well as a third position, "neutral," in which neither feed is engaged.

The spindle of the new machine has phosphor-bronze taper bearings and is provided with a new style positive lock nut at the ends.

New Attachments Provided

Several new attachments have been provided for the machine, among which is the universal milling and drilling attachment described in THE IRON AGE of July 6, page 29.



The Feed Transmission Is Inclosed in the Knee Casting Which Projects from the Knee and Bears on the Wide Face Shown. The feed control lever, located on left-hand side of the knee, is marked for various positions of engagement.

A new dividing head in which two index plates take care of the indexing formerly done by three is another added attachment. One turn of the index crank is equivalent to a turn of 9 deg. on the spindle. Two arms have been provided on the index plate for quick setting; and for easier handling, these arms are extended beyond the periphery of the plate. The index crank is equipped with a plunger which can be withdrawn and kept out of engagement with the holes in the plate by a slight twist of the knob. The index plates are graduated to read in minutes on spindle. The worm has unusually sturdy support and bearings, and is adjustable for wear. A positive stop has been provided for throwing the worm out of mesh.

The machine is also equipped with a power-driven rotary table attachment. Feed is obtained through a telescopic shaft which is attached to the horizontal long gear in the knee, and is transmitted through bevel gears and shafts which clear the saddle and horizontal table, to a large worm wheel with ball thrust bearings under the rotary table. The worm drive of the table has the same gear ratio as that of the dividing head, so that an index plate can be transferred to the table and indexing can be done as readily as on the dividing head. The dial of the table is graduated down to two minutes. Thus the table can be accurately swung to any desired angle in the horizontal plane.

Another attachment has been provided for slotting. This fits over the end of the rectangular overarm

which gives it rigid support and is driven from the spindle by a crank.

Outstanding among the attachments is a standard vertical head which is bolted to the top of the column after the overarm has been removed, and which has unusual rigidity. It is emphasized that a horizontal machine equipped with this attachment differs in no respect from the standard vertical machine except that the horizontal spindle is omitted. A further advantage is that it can be set over on the column one set of bolts to obtain a greater throat distance, in the normal position the overhang from the column being 15 in.; and when set over, 20⅝ in. The older type of vertical attachment which is driven from the spindle of the horizontal machine and the head of which is fastened over the end of the over arm, is also available.

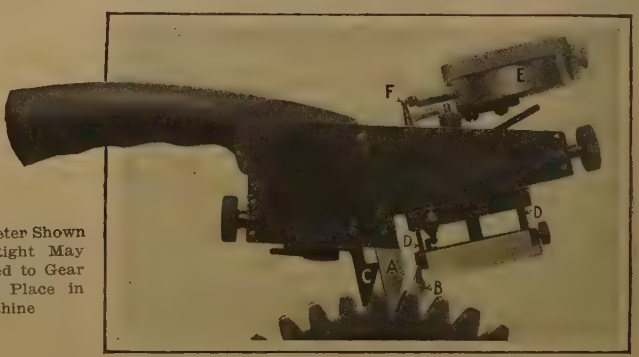
The new Rockford machine is constructed in two sizes, No. 3 heavy and No. 4 standard, the former having a 15 by 55 in. table, with a 34 in. feed, and the latter a 15 by 68 in. table, with a 42 in. feed. The unusually long overarm, 68 in. from end to end, has been retained and the specifications are for the most part the same as given for the previous type of machine.

Instrument for Testing Gear Teeth

The Pratt & Whitney Co., Hartford, has placed on the market a set of instruments for testing gear teeth, known as Odontometers. These instruments, one of which is illustrated herewith, are of simple design and self-contained. They are used for testing the accuracy or uniformity of the gear tooth profiles and spacings of the teeth in production work.

The instrument illustrated on the gear has a range of from 3 to 10 diametral pitch, may be used to check gears of any pressure angle, and can be applied to a gear while it is in place in the machine. In effect it is composed of a section of a straight-sided rack with two parallel effective faces, one fixed and the other

Odontometer Provided with a Stand and Testing a Pinion-Shaped Cutter Is Shown at the Left. The cutter is placed on a surface plate and rolled by the instrument



Odontometer Shown at the Right May Be Applied to Gear While in Place in Machine

movable. A third face, set at an angle to the two working faces, is used to hold the fixed working face in contact with the flank of the gear tooth. The fixed registering surface is at A, the movable indicating surface at B. The third surface, C, holds surface A in contact with the involute surface of the gear tooth. The surfaces B and C are adjustable so that gears of various pitches can be tested with the same instrument.

The indicating surface, B, is mounted on two thin flat springs, D, which act as pivots free from backlash. The dial indicator, E, is actuated by the lever, F, which has a ratio of 5 to 1, each division on the dial representing a movement of 0.0002 in. of the indicating surface, B.

In general the instrument is used as a comparator to test the uniformity of interchangeable and mating gears. If actual measurements are required, the distance between the two parallel working faces of the instrument can be measured. Stands are provided to hold the two smaller sizes of Odontometers when gears or pinion-shaped cutters are being tested. In this case the gear is placed on a surface plate and rolled by the instrument, as shown in the separate illustration. The actual cutting edge of cutters is tested, so that the errors, of whatever nature, are detected.

The gages are made to check gears in the following range of sizes: ¾ to 4 pitch, 3 to 10 pitch and 10 to 24 pitch.

Drill with Mechanical Reversing Device

A reversible electric drill, which reverses mechanically and is intended to eliminate electrical troubles occurring in drills of this type, has been developed by the Independent Pneumatic Tool Co., Chicago.

The reverse is operated through a mechanical device located in the gear case. The motor runs always in the same direction and the shock resulting from reversing the current under load and speed is eliminated. The reversing gear is provided with a locking device which, it is explained, can be shifted instantly to permit a locked constant forward motion for general drilling, reaming, stud driving, nut tightening and tube rolling, and a locked constant reverse motion for backing off nuts and other fastenings. The third shift gives the neutral position which permits the spindle to slip into forward motion when the machine is pressed against the work and to slip into reverse motion as the machine is withdrawn. This is an automatic action that follows the operator's movements, making the tool especially adaptable for use in wood boring, tapping, flue rolling and similar work.

The patent applied for covers the device on both electric and pneumatic tools.

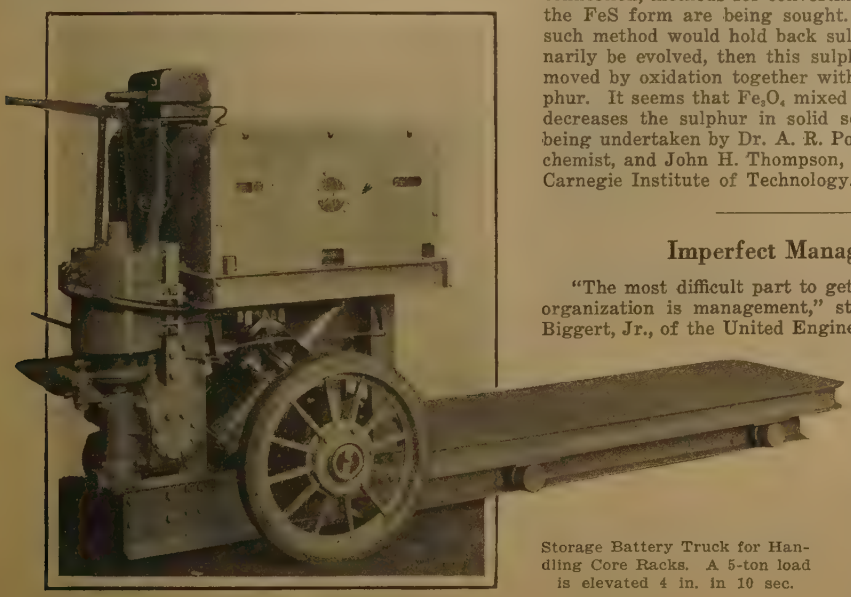
The production of natural gas in the United States in 1920 amounted to 860,540,000 cu. ft., according to the United States Geological Survey. Of the total, 28.4 per cent was produced in West Virginia, 19.3 per cent in Oklahoma and 14.9 per cent in Pennsylvania. The total consumption was 798,210,000 cu. ft., and of this total 20.2 per cent was used in Pennsylvania, 17.1 per cent in Ohio, 15.9 in Oklahoma and 12.6 per cent in West Virginia. The average price paid in Pennsylvania was 32.1c. per 1000 cu. ft., and in Ohio 36.8c. The average price covering the entire consumption was 24.8c.

Platform Truck for Foundry Use

An electric platform storage-battery truck of 5-ton capacity, shown in the illustration, and intended for use in foundries in handling large core racks in and out of core ovens, has been added to the line of the Atlas Car & Mfg. Co., Cleveland.

The load platform is 7 ft. 2½ in. long, 30 in. wide, and in its lowest position is 11½ in. above the floor. Its lift is 4 in. The over all length is 11 ft. 8 in. and the width, 4 ft. The inside turning radius is 5 ft. 9 in. and the outside turning radius is 12 ft. and with a core rack 5 ft. 1 in. wide and 7 ft. long, the car can be operated through interescting aisles 8 ft. wide. The truck without a load has a speed of 700 ft per min., or 8 mi. per hr., the loaded speed depending on the condition of the floor.

The driving wheels have solid metal base rubber tires 27¾ in. in diameter and 4¼ in. wide. The trailing or load carrying wheels are of steel, crown faced, 10¾ in. in diameter by ¾ in. face annd 11¼ in. tread and revolve on a double row of ball bearings. A ball thrust bearing is also provided for ease in steering.



Storage Battery Truck for Handling Core Racks. A 5-ton load is elevated 4 in. in 10 sec.

Steering is applied to all four wheels. The driving wheels have the Atlas type cover over the universal joints and the driving knuckle pivots are provided with inclosed ball-thrust bearings. The driving shafts and universal joints are removable from the outside and held in place by bolted clutch plates.

The driving reduction is through an inclosed worm and wheel, the motor being flexibly coupled to the worm. A contacting type of shoe brake interlocks with the foot-pedal lever and controller safety switch in such a manner that the brake is applied when pressure is completely relieved from the foot brake. The controller handle may be left in speed position but with the use of the interlocking arrangement the brake cannot be released until this handle has been brought to neutral, thus insuring that the truck will always be started on first speed. There are three speeds in either direction. Either Edison or Lead batteries may be used, the latter being the standard.

The elevating mechanism consists of a motor flexibly coupled to a double-worm reduction. A longitudinal shaft keyed to the worm wheel of the last reduction carries two miter gears which mesh with miter gears on the ends of four crank shafts located in a cross-wise position, two being on either side. The outer ends of the crank shafts form crank pins and are provided with hardened steel flanged rollers which bear against hard steel wearing plates on the under side of the platform. In operation these crank shafts are revolved simultaneously a half revolution, which causes the elevating of the load platform. In lowering the load this motion is reversed.

The control of the platform is simple, a handle being pushed upward to raise the platform and pushed down to lower it. It is stated that a 5-ton load is elevated 4 in. in 10 sec. The limit switch is operated automatically by the load platform and is thrown out of circuit in the up and down positions and at the same time a brake is applied to hold the load in place.

Desulphurizing of Coke

A study of the desulphurization of coke was begun July 1 at the experiment station of the United States Bureau of Mines at Pittsburgh. This is a practical follow-up of the theoretical study of the oxidation of iron sulphate in the coke and the subsequent removal of the free sulphur formed by this oxidation. Literature on this subject is being reviewed. Many patents were taken out in the years 1850 to 1870 and few since. Roasting and steaming were favorite methods. In this connection, methods for converting sulphur in coke into the FeS form are being sought. A process based on such method would hold back sulphur that might ordinarily be evolved, then this sulphur could later be removed by oxidation together with much additional sulphur. It seems that Fe_3O_4 mixed with coal being coked decreases the sulphur in solid solution. The work is being undertaken by Dr. A. R. Powell, physical organic chemist, and John H. Thompson, research fellow of the Carnegie Institute of Technology.

Imperfect Management

"The most difficult part to get right in a producing organization is management," states President F. C. Biggert, Jr., of the United Engineering & Foundry Co., Pittsburgh, in a statement to employees of the company's plants at Pittsburgh, Youngstown, Canton and Vandergrift, Pa. "It is never 100 per cent right and seldom 70 per cent. On an average, it is probably not 50 per cent right, and yet the advantages of large scale manufacture are so great—I mean that the increased production of goods by large manufacturing is so great—that with only this poor average management it is possible to give real service.

"This part of our manufacturing is poor because we cannot get better men for the job. If management, in which I include all those in authority, can be improved, the cost of all products can be greatly decreased. Where an individual company has exceptionally good management, the result is increased profits to that company, so that in a sense the community is not immediately benefited, but one company cannot long maintain this condition. It soon spreads to competing companies and the general price is lowered.

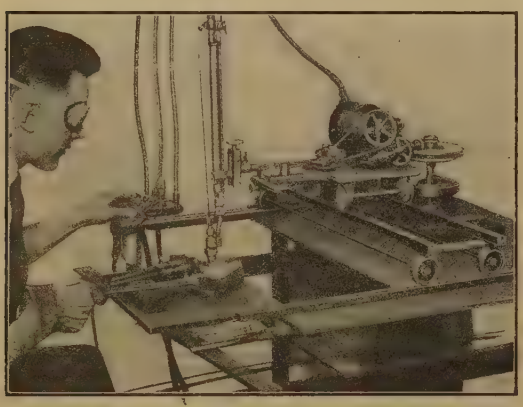
"We have better management to-day than formerly, the average is gradually improving and those companies which advance most rapidly will make the most profits and will, in the end, benefit every person."

Further expansion has been decided on at the Cumberland, Md., plant of the N. & G. Taylor Co., Philadelphia. A larger power house is to be built with improved type of boilers, automatic stokers, coal handling machinery and the like. Additional capacity has been added to the tin house to meet the demand for roofing plate, the company being conspicuously a maker of tin and terne plate. All the open-hearth furnaces of the plant are reported in operation and the bar mill has been running day and night turns.

Automatic Welding Machine

An automatic welding machine known as the "Gewe," the general construction of which may be noted from the accompanying illustration, has been brought out by the General Welding & Equipment Co., Boston.

The machine provides for heating up the line of welding on the work to the proper fusion point and heating up the material to be added, preparing it for fusion with the work and feeding in the added material continuously at a predetermined rate. It is also arranged to puddle together the molten particles of the work and the added material mechanically through the blowing action of the flame and the stirring action of the welding rod. Protecting the spot in fusion and the added material from the influence of surrounding air is by means of the cluster of flame inclosing the center of the weld and the welding rod. The work is said to be welded along the center of the seam and also to a cer-



Welding Machine in Use Joining a Drop-Forged Piece to a Split Tubing. The line of weld is an irregular curve which the machine, mounted on a double carriage system, follows by means of a pattern and a special drive

tain distance over both sides, the added material being spread over the same area.

The welding operation is performed not only with a straight progressing movement but also with an independent circular or elliptical movement of the torch, the combination of both movements being said to result in a spirally progressing, overspreading and overlapping weld. Separate adjustments are provided for the different procedures, which are operated mechanically and done at the proper moment with precision and without fatigue.

The illustration shows the machine in operation joining a drop forged steel piece of varying thickness to a split tubing of uniform thickness. The line of weld is an irregular curve, which the machine mounted on a double carriage, follows by means of a pattern and a special drive. The self-feeding torch, known as the No. 4, is oscillated in circles or in ellipses through an independent ex-center movement actuated by the sprocket shown. This movement is adjustable within wide limits. The finer feed regulations are obtained by an electric rheostat moved by the foot and permits slowing the machine down until heat conditions are right for steady movement. The welding wire passes through the center of the multiple-flame tip and feeds by gravity. It presses into the weld and when moved in spirals also forges itself in laterally. Thus, it is claimed, a combined fusion and forged weld is obtained.

A machine for heavy welding and having two torches is also available. On this machine one torch precedes the self-feeding torch and preheats the seam to very near the fusion point. Both torches are independently adjustable as to heat, height and inclination.

For extra long welds, such as long tanks, several sets of tandem torches can be used, each set welding one linear foot, a tank 8 ft. long being welded with seven sets, each starting a foot apart and the machine proper only progressing one foot. This, it is pointed out, would eliminate expansion, distortion and strain caused by one-sided overheating, and would finish the work in one-eighth the time.

To Exhibit Electrical Heating Equipment

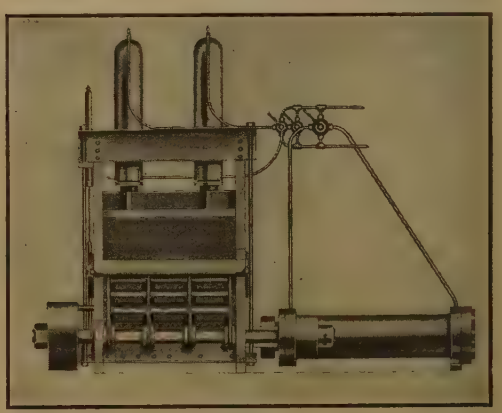
A portable semi-automatic arc welding outfit will be shown by General Electric Co. at the Chemical Exposition, Grand Central Palace, New York, during the week of Sept. 11. This outfit is mounted on a truck and will be in actual operation. The rest of the company's exhibit will consist of various devices for the industrial utilization of electric heat. Among them will be a semi-cylindrical heat treating furnace, a tool-room muffle furnace and a soldering iron muffle furnace. In addition there will be an electric rivet heater, an electrically heated oil tempering bath, a self-regulating metal melting pot for melting solder, babbitt, or similar non-ferrous metals, and a display of individual heating units. The exhibit will be in charge of I. W. Shugg, of Schenectady.

Hydraulic Press for Baling Scrap

A bundling press employing the hydraulic principle has been developed by S. H. Garrett, 234 North Thirteenth Street, Philadelphia.

The machine, shown in the accompanying illustration, is known as the Tempus No. 4. All parts where stress occurs are either of structural or cast steel and wearing surfaces are lined with heavy boiler plate which can be readily replaced when worn. The cylinders are composition lined and provided with quick return movements. The pump may be driven either by a direct connected motor or by belt.

An outstanding feature is the large and conveniently low feeding opening, into which the scrap to be bundled may be shoved, forked or shoveled. This is obtained by dropping one side of the hopper to an angle of 55 deg., making a receptacle similar to a hay rack. When the charge is in, this side is closed by a hydraulic



Scrap Baling Press. A feature is the low feed opening

cylinder through a rack and toggle movement, forming the first operation in the squeezing process. At the same time the upper ram is moving down, making the second movement, after the completion of which the main pressure is applied. This forces the mass into a rectangular chamber, which is provided with a friction device that resists to within a fraction of the ultimate pressure.

The process is then repeated. When the second billet is formed, the first is pushed out, either to drop on the floor or to be carried by means of a chute to a storage pile or placed directly into a car. This chute can be made any length and made to run in any direction and by reducing the friction the entire force of the press may be made available for conveying the finished billets.

The Youngstown Boiler & Tank Co., Youngstown, Ohio, is enlarging its capacity and installing additional equipment.

Proposed Steel Mergers Are Not Illegal

Attorney General Daugherty Renders Exhaustive Opinion Concerning Union of Independent Steel Companies

BY L. W. MOFFETT

WASHINGTON, July 25.—In giving the anticipated clean bill to the independent iron and steel companies which are proposing to merge, Attorney General Harry M. Daugherty, in his report to the Senate last Friday, presented a really profound and interesting study not only of the negotiations of the corporations involved, but also of the steel industry itself. With this basis established, the Department of Justice, discussing the question from a legal point of view and the probable effect of the mergers, held that they would not be in violation either of the Sherman act, the Clayton act, or the Webb act. Going further, the Attorney General said that the motive which prompts the Bethlehem Steel Co. to acquire the Lackawanna Steel Co. is solely the desire to acquire greater efficiency and economy in production, etc. Dealing with the proposed merger of the Midvale Steel & Ordnance Co., the Republic Iron & Steel Co., and the Inland Steel Co., the opinion said that nothing in this merger violates the Sherman act and "that there is not the slightest ground to believe that restraint of trade or monopolistic control will result." It was held that there is but one underlying purpose in the combination; that is, to enable the new company to compete with the United States Steel Corporation, which, because of the widespread distribution of its various plants and their easy accessibility to the sources of raw materials, is "enabled to produce and sell its products much cheaper than other products." Emphasizing this point, the Attorney General said: "Instead, therefore, of being in restraint of trade, the new combination will be in furtherance of trade."

View of Bethlehem Purchase of Lackawanna:

Ingot production would be 9.7 per cent of the country's total.

"I am unable to find in the exhaustive investigation I have made any reasonable warrant for asserting that the public will suffer if this combination goes through. . . . The merger now under consideration will be neither an actual monopoly nor even an attempt to monopolize."

View of Midvale-Republic-Inland Merger:

"By owning plants that are widely scattered, where production can take place in accordance with the needs of the community lying closest to the plants; by manufacturing products at plants advantageously located to ore supplies; by reducing overhead expenses; and by eliminating unnecessary sales agencies, substantial economies can be effected. The combination being formed for this sole purpose, I am unable to see wherein it is tainted with illegality."

The report of the Department of Justice, made in response to a Senate resolution offered by Senator La Follette, was of the character expected. The Attorney General, in a statement issued on June 21, made it clear that the Department of Justice had exhausted its research regarding the mergers. Indicating that he found nothing illegal regarding them, the Attorney General announced publicly that he would be glad to "hear from any dependable person who has any legitimate argument to offer against the mergers." No such arguments, except those from several State attorneys general relating to possible bearing of the basing point controversy on the mergers, having been submitted, the report clearing the steel companies of any illegal action was submitted to the Senate. The Department of Justice obviously disregarded statements asking that it consider the Pittsburgh base case in connection with the proposed mergers. This latter issue is still a matter that is before the Federal Trade Commission and is extraneous to the merger investigations of both the Department of Justice and the Federal Trade Commission and moreover has not been passed upon one way or the other, except for the issuing of a complaint.

The report of the Department of Justice was confined to the effect of the proposed mergers as they relate to the Sherman act, the Clayton act, and the Webb act. The investigation of the Federal Trade Commission regarding the mergers is under Section 5 of the Federal Trade act relating to unfair methods of competition and the Attorney General would not give any advice as to whether or not the mergers constitute a violation of this latter act.

The Federal Trade Commission, which has already issued a complaint against the Bethlehem and Lackawanna companies, held a conference last Wednesday with representatives of the Midvale Steel & Ordnance Co., the Republic Iron & Steel Co. and the Inland Steel Co., at the suggestion of the steel interests. They explained data that they have submitted regarding the proposed merger and submitted extensive schedules in connection with the questionnaire the commission has sent to steel companies throughout the country, designed to develop the effect of the proposed mergers on the steel trade. It is evident from a statement issued by Attorney Thomas L. Chadbourne, representing the steel companies, that the commission is concerned as to whether this proposed merger has any connection with the merger of the Bethlehem and Lackawanna companies, and also as to whether the proposed merger had been discussed with the United States Steel Corporation. Mr. Chadbourne said distinctly that there was no relation between the proposed Midvale-Republic-Inland merger and that of the Bethlehem and Lackawanna companies and also that the approval or disapproval of the merger by the Steel Corporation "had never been asked or wanted."

Those present at the conference included Chairman John A. Topping, of the Republic Iron & Steel Co.; President A. C. Dinkey, of the Midvale Steel & Ordnance Co.; Chairman L. E. Block, of the Inland Steel Co., and Attorneys Chadbourne and William Wallace, Jr., New York; Levy Mayer, Chicago, and John J. Walsh, of Washington. Joseph P. Tumulty, former Secretary to Woodrow Wilson, also is associated as counsel for the steel companies.

When asked whether, as has been stated, this pro-

ject had the approval of the United States Steel Corporation, Mr. Chadbourne said, "Our proposed organization has never been discussed with any of the officials or directors of the United States Steel Corporation directly or indirectly; its approval or disapproval of our plans has never been asked or wanted."

Asked whether there was any intention to combine with the Bethlehem, Lackawanna, Youngstown, Brier Hill or Steel & Tube of America, Mr. Chadbourne replied, "I wish to declare solemnly that there are no negotiations pending with any of these concerns and no thought of any negotiations." In further discussing the proposed unification, Mr. Chadbourne said, "At the end of the war inflation—October, 1920—the steel producing capacity of the country was overbuilt from 30 to 40 per cent beyond what could reasonably be expected to be the consuming capacity for several years to come. During the succeeding year and a half, the steel companies produced between 30 and 40 per cent of their capacity and the independent companies lost many millions of dollars. The United States Steel Corporation did not suffer any loss during this period. On the contrary, it made a profit. This was due to its advantages in cheaper transportation on raw materials which go into the making of steel; a greater diversification of products so that it was always producing and selling the products most in demand; advantageous location of plants so that it could supply the needed product nearest its point of consumption, thus securing more sales because of saving in the freight rate to the consumer, and cheaper selling and administration costs because of larger operation under one management.

"The independent companies enjoy none of these advantages, and to secure them they must do one of two things. Either build plants supplemental to their own in different localities throughout the country, or combine their properties, or some of them, under one management so as to overcome the handicap to some extent.

"The first alternative would involve great expenditures of captial, which it would be difficult or impossible to raise because additional building would add to the already serious situation of over-production, and any return from such additional expenditures would be very doubtful, as they would have to await the increase in the country's consuming capacity.

"The unification of the Midvale-Republic-Inland companies will produce a unit having plants in Coatesville and Johnstown, Pa., Youngstown and Niles, Ohio; Chicago (Indiana Harbor), Illinois and Birmingham, Ala. In short, it will have plants in the principal consuming districts. Its product will be very much more diversified than the product of any one of the companies, and it will be in a position to stock steel products in the principal markets of the country so as to supply the demand at different points promptly and efficiently.

"The combination of these three companies will not disturb competition in the steel industry. The output of the three companies is only 7½ per cent of the country's production.

"Some products of all three companies, or of some two of them, meet at common points or are sold within the same State. This is true, for instance, of structural shapes, plates, bars and sheets. The plants of the three companies are situated in Pennsylvania, Ohio and Indiana. That is to say, in the Eastern, Middle and Western districts. If circumstances are such that products of Midvale, Republic and Inland can meet at a common point, it must follow that products of all other plants located in any of the three districts can also be shipped to this same common point.

"If we take the actual shipments of the three companies which might have been considered competitive, say in the year 1920, and compare them with the potential competition from all other companies for that same year, we find that unification of the three companies might have eliminated competition in—

Structural shapes to the extent of 65/100ths of 1 per cent (0.65).
Plates to the extent of 1 7/100ths per cent (1.07).
Bars to the extent of 8/10ths of 1 per cent (0.80).
Sheets to the extent of 31/100ths of 1 per cent (0.31).

"In other words, the unification of these three companies would leave the following percentage of the total production of the United States in the field of competition:

Structural shapes	99.35
Plates	98.93
Bars	99.20
Sheets	99.69

"The men who are responsible for this unification realize that they can only hope by the resulting economies to cut off part of the cost differential or from $3 to $5 now enjoyed by the Steel Corporation, so we have planned a most conservative corporate structure in order that our interest charges shall be lower than the Steel Corporation's.

"The basis of the capitalization of the North American Steel Co. involves its assumption of the present outstanding bonds of the three companies. No new bonds will be issued. About 3,222,000 shares of new stock will be issued against 3,563,000 shares of the constituent companies. Additional working capital to the extent of $20,000,000 cash will be provided by sale of common stock. Thus, upon the unification of the properties, the total shares of preferred and common outstanding will be about 3,812,000 compared with the present number of shares of the constituent companies, 3,563,000, and the additional number of shares will be accounted for by $20,000,000 cash working capital added to the assets of the unified company.

"This makes our interest charges on bonds and preferred stocks about $1.41 per ingot ton against the Steel Corporation's $2.30."

The Opinion of the Attorney General

To the President of the Senate:

This communication is in response to a resolution passed by the Senate on May 8, 1922, a copy of which was duly transmitted to me. Without stopping to quote it in full, the resolution starts out with recitals that the public press has announced a proposed merger of seven steel companies, to be followed later by the inclusion therein of the Bethlehem Steel Corporation; that if such a merger takes place the corporation thereby formed will control the steel production of the country outside of that part in the hands of the United Steel Corporation, thereby placing monopolistic control of the country's entire steel production in the hands of two gigantic corporations. These recitals are then followed by requests to the Attorney General and the Federal Trade Commission to inform the Senate what steps they have taken to ascertain the purpose and effects of such a merger; the results of any investigation they may have made; what action they have instituted to protect the public interests; and that the Attorney General inform the Senate whether he thinks it advisable to proceed under the Sherman Act and the Clayton Act to prevent the impending combination.

At the outset I think it proper to call attention to the fact that my predecessors have consistently adhered to the doctrine that the duties of the Attorney General are prescribed by statute; that he is a member of the executive branch and as such is under the guidance and supervision of the President; that for the legislative branch to direct his conduct is a measurable interference with the executive branch; and that he is under no duty to obey the mandates of one branch of the Government when not sanctioned by positive law. The opinions embodying these declarations are copied in the margin. A compliance with this resolution in all of its details demands a departure on my part from what has heretofore been regarded as settled law. I do not intend, however, to allow these rulings to stand in the way of making a full and comprehensive report; but it must not be inferred that by so doing I mani-

fest any intention to challenge the correctness of these rulings or to assail in the slightest degree the reasoning on which they are founded.

Two separate and independent mergers, unrelated to each other in any way, are in process of formation. One is between the Bethlehem Steel Corporation, owning plants in Pennsylvania and Maryland; and the Lackawanna Steel Company, whose plant is at Buffalo. The other is between the Midvale Steel & Ordnance Co., owning plants in Pennsylvania and in Delaware; the Republic Iron & Steel Co., owning plants in Ohio, furnaces in Pennsylvania and in Alabama, and certain plants at East Chicago and Muncie, Indiana, and at Moline, Illinois; and the Inland Steel Co., owning plants close to Chicago.

It will be conducive to a clearer understanding of the situation if I take these mergers up separately. In order to furnish the information which I called for it was necessary for these companies to set at work for many days a large clerical force to go through hundreds of thousands of invoices covering each individual sale for the years 1919, 1920 and 1921, and to tabulate the results. The figures for all these years are before me, but to set them all forth would require an inordinately long report. I shall therefore confine myself to the figures for 1920, which I think can be considered a fairly normal year. As every one knows, there was a heavy slump in the steel business in 1921, and the figures for that year can hardly be regarded as typical.

Bethlehem and Lackawanna Merger

To get an accurate idea of the scope of the activities of the Bethlehem and the Lackawanna, it will be well to present at the outset a list of the articles made by one company which are not made by the other. As to such articles there obviously can be no competition between the two. This process of elimination will eventually lead us to the products which are common to both.

The activities of the Bethlehem may properly be divided into main divisions, one representing the production of steel products, the other the building of ships. Of the selling value of its products in 1920, 61.39 per cent. was derived from the former; 38.61 per cent from the latter. Inasmuch as the Lackawanna does not engage in ship building activities, it is apparent that no competition between the two in this line of business can possibly exist.

Coming now to the division representing the production of steel products, the Bethlehem produces for sale a large number of articles which the Lackawanna does not. These include low phosphorous pig iron; spiegeleisen; ferromanganese; Mayari iron; girder rails for street car service; guard rails; high tee rails; rail braces; frogs; switches, crossings, special track work, switch stands, turntables, Bethlehem structural shapes, ship structural shapes, eye bars, cement mill balls, hollow forgings, press and hammer forgings, fluid compressed ingots, hardened steel rolls, drop forgings, shafting, die blocks, iron, alloy, steel and other highly finished bars, cold drawn bars, spring steel, file steel, rough turned bars, window sash sections, curb bar, barrel hoop sections, blue annealed sheets, black and galvanized sheets, tin and black plate, steel castings, manganese steel castings, cast iron and steel rolls, iron castings, tunnel segments, iron moulds, brass castings, puddle iron, staybolt iron, chain iron, electric tool steel, crucible tool steel, toe calk steel, armor plate, guns, gun forgings, gun mounts, carriage caissons and limbers, range finders, gun sights, air flask forgings, shell forgings, completed ammunition, cartridge cases, fuses, turret mechanisms, armor plate vaults, safe deposit boxes, large gas engines, large oil engines, heavy machinery, large pumps, machine tools, hydraulic presses, steel automobile wheels, cutting and punching tools, special bolts and nuts of all kinds, rivets, washers, tie rods, liner wedges, car and bridge knuckle and cotter pins, clevices, pole line material, turnbuckles, marine engines, Curtiss turbines, Diesel engines, Scotch and Yarrow boilers, condensers, marine auxiliaries, Weir pumps, Dahl fuel oil burners, valves and fittings, paraffine wax machinery, mining machinery, steel and wood, sleeping, private, passenger, baggage and mail cars.

On the other hand, the Lackawanna produces for sale a number of articles which the Bethlehem does not. These include base plates; piling, plate piling, merchant steel bars, including rounds, squares and flats, agricultural shapes, auto sections.

The products produced by both companies for sale may with substantial accuracy be designated as follows: coke by-products, pig iron, blooms, billets, slabs and sheet bars, standard tee and light rails, rail joints, splice bars and tie plates, structural shapes, plates, universal and sheared, concrete bars, steel bridges, viaducts, buildings and pier caissons, railroad spikes, track bolts and nuts.

Taking the figures for 1920 as a basis, it appears that of the income received by the Bethlehem from its steel products division, 67.60 per cent was derived from products which the Lackawanna does not produce. In the case of the Lackawanna, 31.98 per cent was derived from products which the Bethlehem does not produce. Or to state the matter in a different way, the Bethlehem's income received from products common to both companies (including both the domestic and foreign trade) was 32.40 per cent; the Lackawanna's, 68.02 per cent.

In this connection it should be borne in mind that both companies engage in export as well as domestic trade. Inasmuch as the anti-trust laws differentiate between the two, it will be well to produce the figures showing the percentages of each. Of the total income, both domestic and export, received by the Bethlehem from its steel products division in 1920 on all articles, common to both companies, substantially 83 per cent was received from the domestic trade, and 17 per cent from the export. In the case of the Lackawanna, substantially 84 per cent was received from the domestic and 16 per cent from the export.

The following table shows the products in the domestic trade common to both companies in 1920, and the percentage of income represented by each such product to the total income on both common and non-common products, the Bethlehem's income from its shipbuilding activities being wholly disregarded in arriving at the percentages:

Articles	Bethlehem Per Cent	Lackawanna Per Cent
Coke and by-products	3.48	2.12
Pig iron, basic	2.12	2.24
Blooms, billets and slabs	2.06	1.08
Sheet bars	2.15	7.31
Rails—Standard	5.02	30.01
Rails—Light tee	0.06	1.53
Structural shapes, standard	8.82	10.21
Plates, 78½ in. and under	2.23	7.82
Concrete bars, twisted	0.07	0.01
Rail accessories:		
Standard splice bars and continuous and 100 per cent joints	1.96	2.49
Bonzano joints	0.19	0.06
Tie plates, standard	0.19	0.12
Railroad spikes	0.57	0.95
Track bolts	0.56	0.32
Total common products	29.48	66.27
Total all others	70.52	33.73
Total of both	100.00	100.00

Coming now to the products common to both companies, I shall take up each separately and present figures from which a fair idea of the extent of competition between the two can be obtained.

Coke and By-products: The products derived in the making of coke and tar, ammonia sulphate, naptha, benzol, toluol, motor fuel and gas. As might be inferred, the sale of coke and gas is not a normal incident of the steel business. The Lackawanna sold neither in 1920. All that was produced was needed for its own business. The tar is sold outright at the plants to purchasers in that locality. Of the various products, ammonia sulphate, motor fuel and benzol are, in the order named, the most important from the standpoint of revenue. The companies themselves do not engage in the sale of these products. They are delivered to an independent company, which disposes of them on a commission basis wherever a market can be found. Inasmuch as all concerns engaged in the manufacture of gas produce similar products, to say nothing of like products placed on the market by the United States

Steel Corporation through an independent selling agency, it will be seen how really unimportant are these items with respect to the matter in hand.

Pig Iron—Basic: The pig iron produced by both of these companies is primarily intended for their own use. The production of pig iron is, of course, the initial step in the manufacture of steel products. As both companies need pig iron in their operations, it is obvious that the sale of this article is but a mere incident. It not infrequently happens, however, that if a surplus is on hand at any particular time the companies are willing to dispose of the same; but this is usually done as a matter of accommodation to a steel manufacturer who happens to be in need of the particular product. In the year in question the entire production of all kinds of pig iron was 36,925,987 tons. Of this amount the Bethlehem produced 4.69 per cent; the Lackawanna, 2.87 per cent. The Bethlehem sold in the domestic trade 107,145 tons; the Lackawanna, 33,997 tons. At the present time the latter company is selling none. The only States in the New England district (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont) where both companies happened to ship in 1920 were Connecticut and Massachusetts; the Bethlehem shipping that year to Connecticut 6865 tons and to Massachusetts 374; the Lackawanna, 8315 tons to Massachusetts and 2337 to Connecticut. In the Eastern district (New York, Delaware, District of Columbia, Maryland, New Jersey, Ohio, Pennsylvania and West Virginia), the Bethlehem sold in that year 99,540 tons; the Lackawanna, 22,327. Of the amount thus shipped by the Bethlehem, about 57 per cent went to Pennsylvania; and of the amount thus shipped by the Lackawanna, about 65 per cent went to New York. The tonnage shipped by the Bethlehem to New York was slightly under 1200; while the Lackawanna's tonnage was slightly over 14,400. The Bethlehem shipped a large tonnage to Delaware; the Lackawanna shipped none. The Bethlehem shipped close to 10,000 tons to New Jersey; the Lackawanna shipped slightly over 4000 tons. The Lackawanna shipped a comparatively small tonnage to Ohio; the Bethlehem none at all. The Bethlehem shipped none at all to the Western district (Colorado, Idaho, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, North Dakota, South Dakota, Utah, Wisconsin and Wyoming); the Lackawanna, only 440 tons. The Bethlehem shipped none at all to the Southern district (Alabama, Arizona, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, New Mexico, North Carolina, Oklahoma, South Carolina, Tennessee, Texas and Virginia); the Lackawanna but 69 tons. The Bethlehem shipped to the Pacific Coast district (Alaska, California, Oregon and Washington) only 366 tons; the Lackawanna, 179.

While statistics are available showing the entire production of pig iron in the whole of the United States, there are none showing the total sales in each particular State. But when we stop to consider that of the total pig iron produced in the United States in 1920, the Bethlehem and the Lackawanna together produced but 7.56 per cent; it becomes at once apparent that any question of competition with respect to pig iron is a matter of small concern.

Blooms, Billets and Slabs: These are semi-finished rolled-steel products, being forms through which the steel ingot passes before its conversion into other steel products. Blooms, billets, and slabs are similar products, differing from each other merely in point of size. As might be implied, they are consumed for the most part by the company which produces them, although a small tonnage finds its way into the hands of some particular manufacturer of steel products. The total production of steel ingots in the United States in 1920 was 40,881,392 tons. Assuming a loss in the conversion of these ingots into blooms, billets and slabs of 15 per cent, which is ordinarily the case, the production of the latter was therefore close to 35,000,000 tons. The total tonnage sold by the Bethlehem in the United States in 1920 was 51,631; by the Lackawanna, 9408. In other words, their combined tonnage sold in the United States in that year was 61,039, the Bethlehem contributing 84.59 per cent and the Lackawanna 15.41 per cent.

Sheet Bars: Statistics are not available showing the entire production in the United States. Like the items last discussed, sheet bars are a semi-finished rolled-steel product and constitute the material out of which sheets are made. Obviously, therefore, the purchaser of this product is usually some particular manufacturer of steel products. In 1920 the Bethlehem sold in the domestic grade 49,870 tons; the Lackawanna, 70,473 tons. In other words, out of a combined tonnage that year of 120,343 the Bethlehem contributed 41.44 per cent; the Lackawanna, 58.56 per cent. There were only six States to which sheet bars were shipped by either company in that year—New York, Delaware, Maryland, Ohio, Pennsylvania, and West Virginia. Of the 70,473 tons sold by the Lackawanna that year 66,248 tons, or 94 per cent of its entire tonnage, were sold in New York, while the Bethlehem shipped none at all to that State. Of the 49,870 tons sold by the Bethlehem that year, 26,803 tons were sold in Maryland and 17,168 in Pennsylvania, representing 88.17 per cent of its entire tonnage. On the other hand, the Lackawanna sold none at all in Maryland and only 1850 tons in Pennsylvania. Of the entire business transacted by these companies, blooms, billets and slabs constitute a very small part.

Sheet Plates—78½ Inches: No mention will be made of plates exceeding the size just mentioned, inasmuch as one of these companies does not produce them. In 1920 the sales made by these companies were distributed as follows: in the New England district, the Bethlehem 1564 tons, the Lackawanna 2720; in the Eastern district, the Bethlehem 37,626 tons; the Lackawanna 43,375; in the Western district, the Bethlehem 2408 tons, the Lackawanna 9612; in the Southern district, the Bethlehem 2500; the Lackawanna 368; in the Pacific Coast district, the Bethlehem 1946; the Lackawanna 5694. In short, out of a combined tonnage of 107,813, the Bethlehem contributed 42.71 per cent, the Lackawanna 57.29 per cent. It will be observed that 81.72 per cent of the total tonnage sold by the Bethlehem in 1920 found its way into the Eastern district as against 70.20 per cent on the part of the Lackawanna. Of the portion produced by both companies which found its way into the area described as Greater New York, the Bethlehem shipped 72 per cent, the Lackawanna 28 per cent. Of the tonnage produced by both which found its way into the rest of New York State, the Bethlehem shipped 8.62 per cent; the Lackawanna 91.38 per cent.

Concrete Bars — Twisted: In the entire United States the Bethlehem sold but 1192 tons; the Lackawanna, only 129 tons.

Structural Shapes: In point of tonnage and revenue this constitutes a very important item. There are two kinds known to the trade, the standard and the Bethlehem. The latter derives its name from the fact that it is made alone by the Bethlehem company under letter's patent. The manufacture of standard shapes is open to anyone. The total tonnage of structural shapes produced in the United States in 1920, both standard and Bethlehem, aggregated 3,306,748 tons. The Bethlehem shipped for the domestic trade 204,837 tons of standard; the Lackawanna, 88,877. In addition the Bethlehem shipped for the domestic trade 185,347 tons of the Bethlehem shapes. In other words, the percentage of the portion shipped by both companies in the domestic trade was 14.49 per cent of the total production in the United States. Of the total tonnage of both shapes shipped by the Bethlehem close to one-third was marketed in Pennsylvania alone, while slightly less than one-tenth was marketed in New York. The Lackawanna, on the other hand, shipped about one-ninth of its product to Pennsylvania and about one-quarter to New York. The Bethlehem shipped about one-thirteenth of its product to Ohio; the Lackawanna, about one-tenth. The Bethlehem shipped about one-sixth of its product to New Jersey; the Lackawanna scarcely any. In passing it may be

(*Continued on page* 246a)

World's Iron Ore Resources, 32 Billion Tons

That Is "Actual Reserves"—Potential Reserves Are Put at Several Times That Amount—A Summary by Countries and Districts

BY OLIN R. KUHN*

It is impossible to estimate closely the world's reserve of iron ore, because of the lack of available information on the unexplored fields and the varying iron content of the ores; but practically all authorities agree that there is a known reserve of from 30 to 35 billion tons of commercial ore.

According to Clarke, the American geologist, the crust of the earth contains 4.4 per cent of metallic iron, a small fraction of which has been concentrated by geological agencies to form commercial iron ore, and for every ton of these ores containing 60 per cent of metallic iron there are many tons that contain 50 per cent, many more tons that contain 40 per cent, and so on. Thus, as the iron makers or blast furnace operators are able to use the lower grades of ore at a cost that is not prohibitive, vast reserves of ore will be available for commercial use.

Iron ores are divided into many classes, as Bessemer, non-Bessemer, low phosphorus, manganiferous, etc., and each class of ore is used for the specific kind of iron or steel that is to be made. What is prejudicial in one ore may be beneficial in another. A self-fluxing ore containing 35 per cent of metallic iron may be more valuable than a refractory ore containing 45 or 50 per cent iron. An ore high in silica content is generally objectionable, because of the additional limestone that is required to neutralize the acid content, thereby decreasing the output of the furnace and increasing the cost of the iron.

The physical condition of an ore is of the utmost importance. A very fine ore chokes the furnace and prevents the free passage of the gases and leads to excessive dust losses unless it is sintered or nodulized. A hard, dense ore, such as some magnetites, is refractory and is more costly to smelt than the less refractory ores.

Extensive explorations have been made in the Americas and in Europe, so that considerable is known of the reserves of iron ore in these continents, but so little has been done in Asia and Africa that no dependence can be put on the estimates of reserves of these continents.

With a known reserve for the world of from 30 to 35 billion tons, assuming that the consumption of ore steadily increases, there is enough proved reserve to supply the requirements of the world for over 75 years. With a potential reserve of over 100 billion tons, there would probably be enough ore for between 150 to 200 years. It seems to be agreed by authorities that the reserve of iron ore in the world will be sufficient to supply the requirements for 200 years or more. Of course, this does not take into consideration the now uncommercial low grade ores or the vast unexplored regions.

A World Map of Iron Ore Resources—Percentages Are Based on an Estimated "Actual Reserve" of 32,555,500,000 Tons, with Potential Reserve Much Larger—the Circles Represent Only Reserves in Excess of 100,000,000 Tons

Over 80 per cent of the known reserves of iron ore are located in five countries—Brazil, United States, France, Newfoundland and Cuba—although the United States is by far the largest producing country, mining from 35 to 40 per cent of the total world production. In 1917, the record year, 76,493,473 tons of iron ore was produced in the United States, 15,084,008 tons in the United Kingdom, and 22,464,780 tons in Germany. But since the war Germany has ceased to be a very large producer and France, by the acquisition of the Lorraine fields, has taken its place.

United States

The United States, which outside of Brazil contains the largest reserve of high grade iron ore in the world, the estimate being about 6½ billion tons, is divided into four districts:

Lake Superior District, including Minnesota, Michi-

*Midvale Steel & Ordnance Co., Philadelphia.

gan and Wisconsin.

Southern District, including Alabama, Georgia, the Carolinas, the Virginias, Tennessee, Kentucky, Maryland, Arkansas, Missouri and Texas.

Eastern District, including New York, New Jersey, New England, Pennsylvania and Ohio.

Western District, including the States of the Plains, the Rocky Mountains and the Pacific coast region.

The Lake Superior district, the largest iron ore producing district in the world, sends out about 85 per cent of the ore mined in the United States. The normal supply from these fields is about 60 million tons annually and the ore is for the most part high grade hematite, averaging over 58 per cent metallic iron, dry content. There are various estimates of the reserves in this district, ranging from 1600 million tons to 3500 million tons, but good authorities agree that there is a reserve of about 3 billion tons of ore averaging over 45 per cent natural metallic iron content. The low grade ore, unavailable at present, is estimated at about 70 billion tons.

The Birmingham field in Alabama is the largest in the Southern district and the ore is for the most part hematite, averaging from 35 to 45 per cent iron and usually high in silica content. The estimate for the Southern district is about 2½ billion tons.

The ores of the Eastern district are generally magnetite, although some red hematite ores of the Clinton age are also found. The magnetites are as a rule low grade, averaging about 25 to 40 per cent iron, but they are usually concentrated, and this raises their iron content to 55 to 60 per cent. There has not been sufficient exploration in the Eastern district to give any close estimate, but it is safe to say there are 500 million tons of commercial ore in these States.

Very little is known about the ores of the Western district, which produces less than 2 per cent of the total output of iron ore in the United States. The ores are hematite, brown and magnetite and are as a rule high grade, running from 55 to 65 per cent iron content. The reserve is estimated at about 500 million tons.

Newfoundland

Newfoundland contains one of the largest iron ore reserves in the world, and it lies within a radius of five miles of Belle Island, in the Wabana basin, a greater part of it lying under Conception Bay. The ore is hematite and averages 48 to 57 per cent iron and 6 to 12 per cent silica. The Stockholm report credits Newfoundland with 3635 million tons of ore.

Canada

There are no large proved reserves of iron ore in Canada, although some is found in New Brunswick, Nova Scotia, Quebec, Ontario, Alberta and British Columbia. Recently there has been a report of a large body of ore found south of Hudson's Bay, but little is known of it and no exploration has been done. The ores are both hematite and magnetite and average from 50 to 65 per cent iron content. Hatch estimates the reserve of Canada at 150 million tons.

Mexico

On account of its lack of fuel Mexico has never been explored for iron ore to any great extent and the two coasts are the only places where deposits would be available for international trade. The ores found have been both hematite and

Iron Ores of the World—Reserves,

Country and District	Reserve in Million Tons: Actual	Reserve in Million Tons: Potential	Iron Content	Kind of Ore
EUROPE:				
United Kingdom				
Northumberland-Durham	35.0	200.0	25-30	Carg.
Cumberland-Lancaster	35.0	100.0	50.00	Hem.
Cleveland	190.0	400.0	30.00	Oolitic
York and Derby	.....	200.0	25-30	Carb.
Lincoln	250.0	450.0	33.00	Carb.
Leicester	62.0	.....	30.00	Carb.
Strafford, Scalop, etc	200.0	800.0	25-30	Carb.
Ruthland and Oxford	123.0	300.0	25-30	Carb.
Northampton	100.0	300.0	25-30	Carb.
Wilts and Kent	.....	5.5	27.00	Cret.
Gloucester	2.5	.....	36.00	Brown
Inverness, Scotland	10.0	.....	23.00	Oolitic
Glasgow and Edinburgh	7 7	400.0	25-30	Carb.
South Wales	.....	1,500.0	25-30	Carb.
Total United Kingdom	1,015.2	4,655.5		
Norway				
Sydvaranger	108.8	310.0	68.00	Mag. Concen.
Sarreisen	.....	43.0	35.00	Mag.
Salangen	21.4	34.0	35.00	Mag.
Lofoten Islands	.....	50.0	35.00	Tit.
Sjaafeld and Melkedal	.....	17.1	35.00	Mag.
Sulitjelma	9.0	17.7	62.00	Mag.
Dunderland	90.0	300.0	35.00	Mag. & Hem.
Eiteraadal	.....	13.0	35.00	Mag. & Hem.
Beitstaden	8.5	23.0	48.00	Mag. & Hem.
Total Norway	237.7	808.1		
Sweden				
Kirunavaara-Luossavara	365.0	840.0	54.00	Mag.
Ekstromberg	20.0	40.0	62.00	Mag.
Suappavaara-Leveanieni	50.0	61.7	60.00	Mag.
Gellivaare	129.0	115.7	51.00	Mag.
Ruouteyare	.....	12.0	40.00	Tit.
Central Sweden	185.0	120.0	40.00	Hem.
Taberg	.....	50.0	50.00	Mag.-Tit.
Total Sweden	749.0	1,239.4		
Finland:				
Jussaro	.....	30.0	38.00	Mag.
Pitkaranta	13.5	7.0	30.00	Mag.-High Sul.
Total Finland	13.5	37.0		
Germany:				
West Rhine	4.0	0.5	30.00	Brown
East Rhine-Kalkberg	3.5	4.0	40.00	Brown
Siegerland	116.0	50.0	38-40	Carb.
Lahn-Dill	166.0	100.0	48.00	Brown & Hem.
Westerwald-Taunus	15.7	15.3	35.00	Brown
Spessart	3.5	3.5	33.00	Carb.
Weser-Salzgitter	248.0	1,000.0	30.00	Brown & Ool.
Harz Mountains	20.5	55.0	45.00	Brown & Hem.
Kellerwald	4.0	8.0	48.00	Brown & Hem
Lower Hesse	1.5	2.0	40.00	Brown
Bentheim	.....	200.0	30.00	Brown
Teutoburger Wald	20.5	100.0	35.00	Brown & Carb.
Oolitic Ores	20.0	100.0	32.00	Oolitic
North and Central Germany	8.0	8.0	30.00	Bog Ore
Thuringia	52.0	105.0	45.00	Silic. Carb.
Bavaria and Wurttemberg	42.0	1,100.0	35.00	Brown
Silesia	0.6	.....	50.00	Mag.
Total Germany	725.8	2,851.3		
Luxemberg:				
Lorraine Field	200.0	70.0	25-40	Brown
Belgium:				
Mamur and Liege	7.1	7.1	35.00	Hem.
Antwerp and Limburg	.....	66.0	35-40	Brown
Total Belgium	7.1	73.1		
France:				
Lorraine	4,800.0	1,500.0	25-40	Brown
Haute Marne	13.5	10.0	40.00	Brown
Dielette	50.0	50.0	55.00	Mag. & Hem.
Calvados Manche	175.0	2,000.0	47.00	Oolitic
Brittany and Anjou	250.0	500.0	50.00	Mostly Brown
Pyrenees-Orientales	30.0	30.0	54.00	Spathic
Total France	5,318.5	4,090.0		
Spain:				
Lugo	70.0	40.0	48.00	Brown & Spa.
Leon	25.0	100.0	49-52	Brown
Oviedo	60.0	50.0	57-64	Brown & Hem.
Santander	20.0	.....	55.00	Brown
Vizcaya	35.0	30.0	49-62	Brown & Hem.
Guipuzcoa and Navarra	8.0	4.0	52.00	Hem.-Calc.
Logroma	.....	20.0	32.00	Low Grade
Saragossa	34.0	.....	60.00	Hem.
Terrel and Guadalajara	130.0	60.0	50.00	Brown
Badajoz	7.0	7.0	55-66	Hem. & Mag.
Huelva	174.0	.....	51-58	Brown & Mag.
Seville	18.0	18.0	50.00	Brown & Mag.
Malaga	10.0	.....	55.00	Brown & Hem.
Granada	17.0	10.0	50-59	
Almeria	45.0	24.0	50-59	
Murcia	25.5	10.0	50.00	Mangan.
Total Spain	678.5	373.0		
Portugal:				
Mancorvo	10.0	25.0	40-60	
Serra dos Monges	3.0	.....	55-63	Brown
Porto de Moz	1.0	2.0	55-60	
Sao Thiao de Cacem	3.0	.....	30-40	Mangani
Total Portugal	17.0	27.0		

magnetite, averaging 55 to 65 per cent iron, and most of the deposits are located in the states of Guerrero, Micheacan, Oaxaco and Pueblo. The International Geological Congress placed the reserve of Mexico at 55 million tons, but more recent explorations have shown that the reserve is far greater than this.

Average Iron Content and Kind of Ore

Country and District	Reserve in Million Tons—Actual	Reserve in Million Tons—Potential	Iron Content	Kind of Ore
Switzerland:				
Jura Mountains	1.0	1.0	42.00	Tit.
Erzegg-Planplatten	2.5	2.5	30.00	Ool. & Sil.
Total Switzerland	3.5	3.5		
Italy:				
Elba	2.5	.....	60.00	Hem. & Mag.
Sardinia	.....	6.0	45.00	Ool. & Mag.
Val d'Austa	6.0	.....	55.00	Mag.
Central Italy	2.0	.....	40.00	Brown
Total Italy	10.5	6.0		
Austria:				
Carinthia-Huttenberg	7.0	.....	50.00	Brown & Sid.
Styria-Erzberg	210.0	150.0	50.00	Brown & Sid.
Total Austria	217.0	150.0		
Czecho-Slovakia:				
Ruthenia	50.0	18.0	35.00	Ool. Hem.
Bohemia	35.0	100.0	38.00	Brown
Total Czecho-Slovakia	85.0	118.0		
Poland:				
Jurassic Ore	32.5	210.0	30–35	Brown & Spa.
Bog Ore	2.0	2.0	30–35	Brown & Spa.
Total Poland	34.5	212.0		
Rumania:				
Hunyad	3.7	13.3	44.00	Brown & Carb.
Banat	2.5	10.0	40.00	Brown & Spa.
Total Rumania	6.2	23.3		
Jugo-Slavia:				
Vares	21.0	40.0	45.00	Hem. & Sid.
Greece:				
Kopias	40.0	50.0	45.00	Brown-Chrom.
Russia:				
Moskva Basin	300.0	400.0	40.00	Brown
Voronezh and Tamlof	50.0	75.0	40.00	Brown
Orel and Kursk	.....	37.0	40.00	Brown
Krivoi Rog	50.0	100.0	50–70	Hem.
Kerch	100.0	200.0	40–45	Oolitic
Caucasus	10.0	30.0	62.00	Mainly Mag.
Ural Mountains	2.0	1.0	40–60	Hem. & Mag.
Perm & Viatka	20.0	20.0	22.00	Siderite
Gora Blogodat	10.0	10.0	27.55	Hem. & Mag.
Versk Isetsk	6.5	.....	50–60	Brown & Hem.
Alapaievsk	30.0	50.0	44.00	Brown
Bakalsk	26.0	10.0	50.00	Brown
Magnitnaig Gora	25.0	25.0	45.00	Hem. & Mag.
Total Russia	629.5	958.0		
Total Europe	10,009.5	15,785.2		
ASIA:				
India:				
Bengal and Central Prov.	400.0	.....	64–69	Hem. & Mag.
China:				
Ta-Yeh and Pen-Hsi-Hu	400.0	.....	60–62	Hem. & Mag.
Japan:				
Kamaishi	20.0	.....	55–60	Mag.
Total Asia	820 0	457.0		
AFRICA:				
North Africa:				
Tunis and Algeria	150 0	.....	50–60	Hem.
South and West Africa:				
French West Africa	100.0	.....	62.00	Hem.
Australia:				
New Zealand—N. S. Wales	136.0	.....	50–68	Brown & Hem.
Total Africa	386.0	.....		
NORTH AMERICA:				
Newfoundland:				
Bell Island	3,635.0	.....	48–57	Hem.
Canada:				
Total Canada	150.0	.....	46–66	Hem. & Mag.
United States:				
Lake Superior	3,000.0	.....	54–62	Hem.
Southern District	2,500.0	.....	32–45	Hem.
Eastern District	500.0	.....	25–65	Mag.
Western District	500.0	.....	45–69	Hem. & Mag.
Total United States	6,500.0	70,000.0		
Mexico:				
West Coast	55.0	.....	42–67	Hem. & Mag.
Cuba:				
Oriente-Mayari	600.0	.....	40–50	Brown Hem.
Levisa	75.0	.....	40–50	Brown Hem.
Moa	1,985.0	.....	40–50	Brown Hem.
Camaguey	450.0	.....	40–50	Brown Hem.
Pinar del Rio	40.0	.....	55–65	Mag. & Hem.
Total Cuba	3,150.0	12,000.0		
Total North America	13,340.0	82,000.0		
SOUTH AMERICA:				
Venezuela: Orinoco	500.0	.....	65–68	Mag.
Chile: Valparaiso		.....	55–68	Mag.
Brazil: Minas Geraes	7,500 0	.....	60–70	Hem.
Total South America	8,000 0	.....		
Total World Reserve	32,555.5	98,242.0		

Cuba

About 90 per cent of the Cuban ores are brown and hematite and are found on the northeast coast of the Oriente Province. The famous Mayari field lies in this district. The ores average from 40 to 50 per cent iron, 6 to 14 per cent alumina, 1 per cent nickel, and 1.5 per cent chromium; but on account of the high moisture and sulphur content it is necessary to roast them before they are desirable for commercial use. The reserves of Cuba are estimated at 3 billion tons. Cuba has no iron industry and exports its entire production of ore. About 80 per cent of the ores in Cuba reserve are owned by four steel companies in the United States.

Venezuela

The ore depostis of Venezuela are located in the delta of the Orinoco River and the ore is generally magnetite. Eckel estimates that Venezuela and Chile have 500 million tons of high grade ore.

Chile

The iron ores of Chile are scattered along the west coast north of Valparaiso and consist chiefly of high grade hematite. The Bethlehem Steel Co. is operating a property at Tofo which is said to contain 200,000,000 tons of ore.

Brazil

Brazil has probably the largest undeveloped iron ore reserve in the world, being estimated by Merriam and Leith at 7½ billion tons averaging from 60 to 70 per cent iron. The principal deposits are located in the State of Minas Geraes, but so far little ore has been produced.

United Kingdom

The bulk of the ore in the United Kingdom is found in England and is of the carbonate variety, averaging from 25 to 35 per cent iron. Roesler estimates the known reserve at about 1015 million tons. England does not produce enough ore for its consumption and must draw upon Spain, Norway and Sweden.

Norway

The greater part of the iron ores of Norway are low grade magnetites, averaging about 35 per cent iron, and must be concentrated before they are desirable for furnace use. The Sydvaranger and Dunderland deposits are the largest, and the other deposits average from 50 to 60 per cent iron. The known reserve is estimated at about 237 million tons. Norway has no iron industry and exports practically all of its ore production.

Sweden

Sweden is renowned for the great purity of its iron ores. The largest deposits are in the north of Sweden and the ores, generally magnetite, contain about 62 per cent iron and are low in sulphur. The known reserve is estimated at about 750 million tons. Sweden exports over 80 per cent of its ore production.

Germany

Since the war, by the loss of the Lorraine fields, the reserves of Germany

have been greatly reduced. The ores are, as a rule, low grade brown or hematite and in some cases must be roasted to reduce the moisture. Germany without the Lorraine field only produces 5 to 10 million tons annually, while in 1913 she consumed 48 million tons, so that in the future she will have to import a great part of her ore. About 90 per cent of the reserves, which are estimated at about 725 million tons, are located in the Rhine and Wesser fields.

Luxemburg

The Luxemburg deposits lie in the Lorraine basin and are estimated to contain about 200 million tons. These ores are controlled and consumed by Germany.

Belgium

The Belgian iron ore deposits are small and are generally low grade brown ore averaging from 35 to 40 per cent iron and high in phosphorus. They are located in the Antwerp-Limburg district and the known reserve is estimated at only 7 million tons. The ore production of Belgium is very low and practically all of the ore it consumes is imported from France.

France

France ranks next to the United States and Brazil in reserves of available iron ore, the largest deposits being those of the Lorraine basin. France at present will produce about 40 million tons annually. The Lorraine ores are of the low grade brown type, averaging from 25 to 40 per cent iron, and are generally high in phosphorus. The other deposits in Normandy and Brittany are hematite and average about 50 per cent iron. Roesler estimates the reserve of France, including Lorraine, at 5318 million tons, the Lorraine field alone containing 4813 million tons.

Spain

Deposits of iron ore are scattered all through Spain, and the ores are generally brown, hematite, and spathic, averaging from 50 to 65 per cent metallic iron and low in phosphorus. The Huelva deposits in southern Spain are the largest. Spain produces 8 to 10 million tons of iron ore annually, most of which is exported, and the reserve is estimated at 678 million tons.

Portugal

The deposits of Portugal are small and the ores average from 40 to 60 per cent iron. Portugal has no iron industry. The reserves are estimated at about 17 million tons.

Italy

There are no large deposits of iron ore in Italy, the largest being the Val D'Aesta in the north, which has a known reserve of about 6 million tons. The ores are high grade magnetite low in phosphorus. Roesler credits Italy with a total of 10 million tons, and Italy and Switzerland with a reserve of 14 million tons. Italy produces about 1,000,000 tons of ore per year, which is consumed in Italian furnaces.

Austria

The only deposits of iron ore in new Austria are the Erzberg deposits of Styria and the Huttenberg deposits of Carinthia. The ore is as a rule low grade and must be roasted before it is suitable for use. The reserves of Austria are placed at about 217 million tons.

Czecho-Slovakia

The largest ore deposits in Czecho-Slovakia are in Bohemia and Ruthenia. The ore is generally low grade hematite and brown, averaging about 35 per cent iron, and must be roasted to reduce the moisture. Czecho-Slovakia has a reserve of about 85 million tons and produces from 2 to 3 million tons annually.

Poland

The main deposits of Poland are Jurassic and bog ores averaging from 30 to 35 per cent iron, and the known reserve is estimated at only about 35 million tons.

Rumania

There are no extensive iron ore bodies in Rumania

Iron Ore Produced in Some Principal Countries, 1913 and 1916-1920, in Metric Tons. Table from "Mineral Resources, 1920," Part I

Country	1913	1916	1917	1918	1919	1920	Source of Data [a]
North America:							
Canada [b]	279,084	249,638	195,317	191,967	178,869	115,961	1913-1920, 1.
Cuba [b]	1,607,750	724,119	562,341	653,829	363,522	896,952	1913-1920, 2.
Newfoundland [b]	1,456,859	918,121	801,172	769,809	453,565	585,074	1913-1920, 1.
United States	62,972,124	76,370,355	76,493,473	70,772,810	61,943,913	68,689,517	1913-1920, 2.
South America:							
Chile	14,100	56,166	5,000	2,743	.....	.....	1913-1917, 3; 1918-1920, 2.
Venezuela [c]	58,141	.....	.....	.....	.....	.....	1913, 4.
Europe:							
Austria-Hungary	5,318,531	(d)	3,744,656	(d)	(d)	(d)	1913, 5; 1917, 30.
Belgium	150,450	30,430	17,000	500	4,820	(d)	1913-1919, 6.
France	21,917,870	1,680,684	2,034,721	1,671,851	e9,412,786	e13,871,187	1913-1918, 7; 1919-1920, 9.
Germany	e28,607,903	e21,333,664	e22,464,780	e18,392,569	(d)	(d)	1913-1917, 10; 1918, 10 and 11.
Greece	313,578	84,985	63,364	67,871	46,939	44,751	1913-1917, 12; 1918, 30; 1919-1920, 8.
Italy	603,116	942,244	993,825	693,872	613,025	423,300	1913-1919, 13; 1920, 8.
Luxemberg	7,333,382	6,957,854	4,502,692	3,131,400	3,111,602	(d)	1913-1917, 10; 1918, 11; 1919, 30.
Norway	544,686	417,899	302,739	95,887	(d)	(d)	1913-1918, 14.
Portugal	49,182	2,261	7,381	.....	8,712	12,845	1913, 5; 1916-1918, 30; 1919-1920, 8.
Russia	9,513,945	(d)	(d)	(d)	(d)	(d)	1913, 15.
Spain	9,861,668	5,856,861	5,551,071	4,692,651	4,640,061	4,767,693	1913-1919, 16; 1920, 8.
Sweden	7,475,571	6,986,298	6,217,172	6,623,661	4,981,110	(d)	1913-1919, 17.
United Kingdom	16,254,085	13,711,247	15,084,008	14,847,571	12,450,875	12,911,430	1913-1920, 18.
Asia:							
China	f423,003	278,555	304,356	c382,719	c640,420	c682,938	1913, 19; 1916-1917, 5; 1918-1920, 30.
Chosen	142,012	245,355	140,613	202,882	423,267	(d)	1913-1916, 4; 1917, 30; 1918-1919, 20
India	376,797	418,418	419,991	500,607	572,798	(d)	1913-1919, 21.
Japan	171,656	158,815	(d)	232,436	204,846	(d)	1913-1916, 4; 1918-1919, 22.
Africa:							
Algeria	1,348,899	1,042,865	985,293	902,465	735,579	1,071,278	1913-1918, 7; 1919-1920, 23.
Rhodesia	.....	4,887	4,799	5,765	2,268	.....	1916-1920, 24.
Tunis	597,500	500,935	605,958	421,543	(d)	(d)	1913-1918, 7.
Union of South Africa	.....	.....	.....	4,426	3,268	2,326	1913-1920, 25.
Oceanica:							
Australia—							
New South Wales [g]	75,981	95,626	97,840	120,548	149,134	161,294	1913-1919, 26; 1920, 8.
Queensland	41,031	44,870	25,467	43,469	25,072	20,025	1913-1919, 20; 1920, 8.
Southern Australia	61,632	191,352	333,657	261,154	272,840	419,667	1913-1920, 28.
Philippine Islands	(d)	(d)	(d)	(d)	18,598	(d)	1919, 29.

[a] 1, Canada Dept. Mines, Mines Branch; U. S. Geol. Survey; 3, Anuario estadístico de la República de Chile; 4. Bur. Foreign and Domestic Commerce; 5, National Federation of Iron and Steel Manufacturers (London); 6, Statistique des Industries Extractives et Métallurgiques; 7, Statistique de l'Industrie Minérale; 8, Official Preliminary; 9, *Min. Jour.*, April 23, 1921; 10, Vierteljahrshefte zur Statistik; 11, Comité Central des Houillères de France, No. 5532; 12, Tableaux Statistiques du Mouvement Minier; 13, Rivista del Servizio Minerario; 14, Norges Offisielle Statistik; 15, Russian Gornago Dept. Mining and Metallurgical Industries; 16, Estadística Minera de España; 17, Bergshantering Sveriges Officiella Statistik; 18, *Mines and Quarries* (London); 19, *Iron Trade Review;* 20, Official data furnished by American consul-general, Keijo (Seoul), Chosen, and American Embassy, Tokio, Japan; 21, Records Geol. Survey of India; 22, Mining Industry of Japan; 23, Consular Report; 24, Rept. Secretary for Mines; 25, Ann. Rept. Dept. Mines and Industries; 26, Ann. Repts. Dept. Mines; 27, Ann. Repts. Under Secretary for Mines; 28, Review of Mining Operations, Dept. Mines; 29, Mineral resources of the Philippine Islands; 30, Imperial Mineral Resource Bureau, London. [b] Shipments. [c] Exports. [d] No data available. [e] Includes Lorraine. [f] From Tayeh deposit. [g] Includes iron ore from State mines received at Eskbank Iron Works, Lithgow, also ironstone for flux and iron oxide.

and the reserve is estimated at only about 6 million tons of carbonate ore, averaging about 44 per cent iron. Rumania has no iron industry and produces practically no ore.

Jugo-Slavia

The only ore found in Jugo-Slavia is in Bosnia, and it is of the hematite variety. The reserve is estimated at 21 million tons. The production is very small and the ore is used in the furnaces of Trieste.

Greece

The principal deposits of iron ore in Greece are the chromiferous hematite ores near Lake Kopais. They average about 45 per cent iron and 2 per cent chromium and the reserve is placed at about 40 million tons. Practically all of the ore is exported. There are several small deposits of manganiferous ores in the islands of Syra, Cerigo, Zea, Thermia and Serpho.

Russia

The largest bodies of iron ore in Russia are found in the central and southern parts of the country and the most extensive of these are the deposits at Lipetsk, but the ore averages only about 40 per cent iron. Some high grade hematite ores averaging from 50 to 70 per cent iron are found in the southwest around Krivoi Rog. Russia produces about 10 million tons annually and the reserve is estimated at about 630 million tons.

India

The main deposits of India are hematite similar to those of the Lake Superior district in the United States and are located at Mayurbhanj and Singhum in Bihar and Orissa, Clanda and Drug in the central provinces, and Kadur in Mysore. The ores are high grade, averaging about 60 per cent metallic iron, but on account of the small portion of India that has been explored no very correct estimate of reserves can be given. The known ores are estimated at about 400 million tons, running above 60 per cent in iron.

China and Korea

As with the rest of Asia, very little is known about the iron ores of China. The largest known deposits are at Hanyang in Hu-Pei Province, which are estimated to contain over 100 million tons of hematite ore, and the magnetite deposits of Pen-Hsi-Hu, which are said to contain another 100 million tons of commercial ore. The ore is high grade, ranging from 50 to 65 per cent iron. Foster Bain, chief of the United States Bureau of Mines, gives the reserve of China and Korea at 400 million tons of known ore, although all authorities seem to agree that the undiscovered ores will prove many times that amount.

Japan and Chosen

The iron ores of Japan are widely distributed and the total available tonnage is fairly large, but no single large deposit is known. There are five producing deposits, the Kamaishi, Nakakasaka, and Hitekabe, which contain magnetite, and the Sennin and Chugeku deposits, which are hematite. The Kamaishi deposit is probably the largest and the ore will average from 55 to 60 per cent iron. Ineuye estimates the known reserve of Japan at 20 million tons.

North Africa

The only data on iron ore deposits in northern Africa show deposits in Tunis, Algeria and Morocco. The ore found is generally hematite and averages from 50 to 60 per cent iron. Eckel gives the reserve of these three countries as 150 million tons.

East and Southeast Africa

Brown hematite ores have been found in Egypt and the Soudan, but the deposits are scattered and little is known of them. Some magnetite ores are reported from Uganda, British Somaliland, and East Africa Protectorate, and there are large bodies of ore in the Congo and German East Africa, but no estimates of reserves are given for any of the deposits.

South and West Africa

Various types of ore are found in South and West Africa somewhat similar to those found in Cuba. They are generally of high silica and alumina content and fairly high in iron. One deposit in French West Africa has been found recently to contain a reserve of about 100 million tons, and others are found in Rhodesia and Transvaal, but like the rest of Africa, little is known of the amount of reserve tonnage.

Australia

Although no definite estimates are given of the reserve of ore in Australia, high grade hematite is found in New Zealand, New South Wales and Tasmania in considerable quantities, with scattered deposits in Victoria, Queensland, West and South Australia. Sjogren estimates the total for Australia at 136 million tons.

Summary

The above countries show a total reserve of known ore of 32,555,500,000 tons, equivalent to about 15,000 million tons of metallic iron, and the potential or possible ore will probably reach 100 billion tons. F. H. Hatch in 1920 estimated the actual reserve at 31,800 million tons and Sjogren in 1910 estimated it at 32,408 million tons, with a potential reserve of over 125 billion tons. E. C. Eckel in 1914 estimated the known ore at 34,792 million tons, with a potential reserve of over 90 billion tons.

Great Tonnage Moved at Steel Plants

YOUNGSTOWN, July 25.—Dependence of operations of important iron and steel properties on transportation is again being emphasized in curtailments following in wake of shopmen's strike. Within the plants of large industrial companies an astonishing volume of material is being constantly moved by rail.

"Transportation is of vital importance in a large industry," states V. W. Delaney, superintendent of transportation of the Youngstown Sheet & Tube Co. "Every commodity entering into manufacture must be handled by rail and all finished material likewise.

"Our plant has handled a maximum of 32,000 cars in one month to and from railroads, averaging better than a thousand a day. Every car averages five separate moves from its arrival to departure from our tracks, making a grand total of approximately 5000 car movements per day and necessitating almost clock-like work to avoid delays to some department or group of workmen.

"The greatest co-operation must exist between the more than 150 foremen ordering work, and the car department. Locomotives cost about $7 per hr. to operate, and a wrong order from a department causing unnecessary work is a costly thing for the company.

"The freight tonnage required to be handled in the normal operation of our plants amounts to more than 5,000,000 tons of inbound freight, 1¼ million tons of outbound and 1,000,000 tons of intra-mill between departments, making a grand total of more than 7,000,000 tons of freight to be handled on our tracks per year. This includes 30,000 cars of ore dumped through our car dumper."

Ignition of Coal Dust by Electric Arcs

The extensive use of pulverized coal for fuel in industrial plants gives interest to tests recently made by the United States Bureau of Mines, which proved that coal dust suspended in air can be exploded by electric arcs under conditions that might prevail in a pulverized coal plant or in a coal mine. If there is electrical machinery in places where coal dust is apt to collect in quantities capable of producing a dust cloud, such electrical machinery should be housed in compartments designed especially for use in dusty atmospheres. Under Schedule 2B, the Bureau of Mines is prepared to conduct investigations looking toward the safety of electrical equipment for this class of service. Details of tests of the ignition of coal dust by electric arcs are given in serial 2365 just issued by the Bureau of Mines.

THE 8-HOUR DAY IN GERMANY

August Thyssen Considers It a Misfortune Under Present Conditions

IN a recent issue of *Stahl und Eisen* an article appeared, commemorating the 80th birthday of August Thyssen, the well-known German iron master. His career is traced from the building of a small plant in 1871 having five puddling furnaces and two rolling mills, the production in the first year amounting to about 3000 tons. Of particular interest to his American friends is the reproduction in the article of a letter he wrote a short time before to the *Mülheimer Zeitung* on the occasion of its 50th anniversary. What Mr. Thyssen says of hours of labor in German industries in their relation to the country's ability to rise from its prostrate position is of special significance. The letter is as follows:

"Consideration of the past, when one thinks of the outstanding anxieties and successes of his work, always gives a certain satisfaction. If, however, one directs his glance forward and tries to look into the future, he is faced with complete uncertainty, and as conditions are at present the outlook is only dark. We have a terrible war behind us, we have experienced hard war years with many privations from which scarcely anyone has been exempt. We have lost the war; we have heavy war burdens to bear, and only dark prospects meet our eyes. We hope for a savior who will deliver us from our distress, but no one knows whence the savior will come. From without certainly no savior can or will come to us; if deliverance comes it can only come from within ourselves.

Work the Only Way Out

"And this deliverance can only lie in work. As work keeps the individual man healthy and sound, so it alone can keep a nation healthy; and on the other hand a nation like ours, which is sick through the war and war conditions, can only be made well again by work. It is a splendid thought that to each man who works there comes a share in the joy of living. I believe that I dare safely say that in general before the war it was the case that each man who was industrious and worked, even if he had a large family to support and because of that had much anxiety, had yet a share in life's enjoyment, even if sometimes perhaps in different amount from others who lived under more favorable conditions.

"It is no part of my intention to discuss the eight-hour day, whether it is really the ideal of the working class, and whether in that is its happiness and the solution of the great living and economic questions. I should be genuinely glad if the times were such that this ideal could be realized. But I am thoroughly sure that the mechanical eight-hour day, as it has been brought in by the revolution, especially in the present times, is a great misfortune for Germany. With a rigid eight-hour day, that for many men on hard work is thoroughly justified but for light work is just as strongly unjustified, we shall not come out from the difficulties in which we find ourselves to-day, and from which we absolutely must come out, come what may, by working ourselves out.

"We can only bring our political administration again to convalescence (especially after the great weakening that it has experienced through the loss of the industrial regions in Lorraine and Upper Silesia which are so important for Germany) by raising our industrial efficiency above the normal, and increasing it to the utmost. We must create values, because without the creation of new values it is impossible to bring the financial conditions of the country again into order.

Community Thought Must Be Cultivated

"We must create values in order to be in position to bring in raw materials, which we lack, from foreign countries, and with them operate our plants to give possibilities for work and wages; and on the other hand to again create values for export and thereby pay for increased imports that we use for the nation's nourishing. In order to reach this it is necessary that the German people themselves reflect and finally bring into use the community thought, about which there has been so much talk but so little action. In recent years, unfortunately (no other designation can be used), a tremendous amount of harm has been done with shibboleths or phrases, but the world cannot be governed with phrases, and I have not found that with them bread is created for the needy.

"The world is full of discontent, there is constantly talk of contrasts, which are thereby aggravated. Every logical man knows that there have always been differences, also class differences, which never can be equalized, and there will therefore always be economic differences. There is constant talk of equality and equal rights which will finally only amount to a desolate uniformity. No one will believe that the able and industrious can endure or will allow being placed on the same level as the idlers, but each must admit that if all were made equal through whatever agency or law the more able and diligent would again raise themselves above the unfit.

"On the one side one reads of the solidarity of the hand and head worker, on the other always of the opposition between proletariat and capital. I suppose I shall be counted in the class of capitalists, but however that may be I am conscious of having worked during my life just as hard as the most able and industrious of the workmen that have worked in the plants of my firm or in other plants.

Capital Interest and Common Interest

"What capitalist and plant owner can have personally of real profit is really little, not even an old age free from anxiety. I believe I dare say without exaggeration that from my life work the general community has had more profit than I myself. What I have created and worked out remains finally to the whole community, because I can carry nothing with me to the other life.

"When I look over everything I can only say that I mostly regret that always prominence is given to that which separates us whether in regard to religious, political or social considerations. On the other hand we have still many things common to the German people, which unite us, and to accentuate these things is far better in my opinion than always to talk of those things which separate us.

"Whether we live under a monarchical or democratic constitution is finally the same if the nation in itself is able and there are able leaders to lead it and give it regulation whereby our national and economic life will be made sound and our fatherland come to honor both at home and abroad. But the chief thing is that we ourselves as German people perceive and form a national community, which without misconstruing and worrying over petty jealousies and the constant bringing up of oppositions, will cultivate the conviction that all, whether high or low, poor or rich, hand-workers or head-workers, together form one nation in the good of which each one has the greatest interest, and to work together should receive from each the highest allegiance.

"The times are hard; the outlook is dark. If one would maintain alive the small gleam of optimism that

we still have within us, then we must make sound the national community spirit, hold together unreservedly, work together and save our earnings as much as possible instead of squandering our money in excessive and frivolous methods of living as seems to be so much the case with the young people.

"As I have said before, the best means of becoming healthy and at the same time the most simple, is and remains work. Only through constant, industrious and hard work, combined with the greatest economy will it be possible for us, even though slowly, to work out of the distress in which we find ourselves today. It is just as certain that without this increased joy and efficiency in work our people and the fatherland that we all love, whatever color we may be known by, must go down in misery."

French Iron and Steel Production for May

PARIS, FRANCE, July 11.—The following figures just given out officially at Paris show the production of iron and steel in France during the month of May, 1922, with totals for the current year so far:

Iron, Metric Tons

	For May, 1922	Preceding Months, 1922	Total for Current Year to May 31
From coke furnaces	435,426	1,385,267	1,820,693
From electric furnaces	6,780	17,792	24,572
Total*	442,206	1,403,059	1,845,265*
Detail of Production			
Forging iron	21,170	76,240	97,410
Foundry iron	102,919	317,025	419,944
Bessemer	1,682	1,727	3,409
Thomas	300,384	949,883	1,250,267
All other iron	16,051	58,184	74,235
Steel, Metric Tons			
Ingots	356,957	1,296,054	1,653,011
Castings	6,846	26,550	33,396
Total*	363,803	1,322,604	1,686,407*
Method of Making			
Converter:			
Acid	2,479	6,871	9,350
Basic	238,708	800,971	1,039,679
Open-hearth furnaces	120,271	503,084	623,355
Crucible furnaces	509	1,896	2,405
Electric furnaces	1,836	9,782	11,618

*Of the above there was produced in disannexed Lorraine during the month of May, 1922, 190,301 tons of iron and 142,856 tons of steel.

Engineers Receive French Honors

Charles F. Rand, chairman of the Engineering Foundation, and Col. A. S. Dwight, president of the American Institute of Mining and Metallurgical Engineers, were decorated on July 20 with the Croix de Chevalier de la Legion d' Honneur by the French Government for distinguished service during the war. The decorations were conferred by Consul General Gaston Liebert, at a luncheon given in his honor at the Engineers Club, New York.

Mr. Rand is internationally known for his years of service in mining as the head of large iron ore properties in this country and Cuba. He is an honorary member of the British Iron and Steel Institute, past president of the American Institute of Mining and Metallurgical Engineers, and as the head of the Engineering Foundation is active in promoting industrial research in the United States. Colonel Dwight is a member of the American Engineering Council of the Federated American Engineering Societies.

M. Liebert said that reconstruction was going on rapidly in northern France, two-thirds of whose industries are now working. The French Government, he said, is planning water power improvement on a vast scale and as a result it would soon be unnecessary for France to import a single ton of coal. He urged that French students be sent to this country to study engineering. It was announced by Calvin W. Rice, secretary of the American Society of Mechanical Engineers, that M. E. de Margerie, director of the Geological Service of France, had been appointed as exchange professor to the United States in applied science and engineering. He will lecture during 1922-23 in seven American universities, starting at Columbia.

Appeals for Retaining Foreign Chemical Patents

Engineers have appealed to President Harding to protect patents sold to America. Dean Mortimer E. Cooley, of the University of Michigan, president of the Federated American Engineering Societies, has announced that a resolution adopted at a meeting in New York on July 14 of the Federation's committee on procedure says that the patents formerly owned by Germany and her allies, and, through the Alien Property Custodian, ordered returned from the Chemical Foundation, "have become the nucleus of our American synthetic organic chemical industry, which must be encouraged for the sake of scientific research, public welfare and national defence."

The hope was expressed that no action will be taken without hearing representatives of chemists, chemical engineers, chemical manufacturers, the medical profession and others most directly concerned. It was implored that nothing be done which can, in any way tend toward the ultimate return to former owners of patents or other property lawfully sequestered and sold to Americans.

Rate on Steel Tanks

WASHINGTON, July 25.—In a tentative report handed down last Friday in connection with a complaint of the Parkersburg Rig & Reel Co., Parkersburg, W. Va., Examiner Warren H. Wagner recommends that the Interstate Commerce Commission find that the rate on steel tanks, knocked down, in carloads from Casper, Wyo., to Bixby and other California points, taking the same rate, be found unreasonable to the extent that it exceeds $1.50 per 100 lb., minimum 4000 lb. The complainant was charged the fifth class rate of $2.84. The report states that the consolidated classification does not distinguish between plates and sheets not otherwise indexed by name. Tanks made of material No. 3 to No. 16 gage, inclusive, were rated the same as tanks made of No. 2 gage and thicker in carloads.

Rates on Wire Fencing

WASHINGTON, July 25.—The Interstate Commerce Commission, pending any action it may take regarding applications for relief from the long-and-short haul provision, has authorized rates on wire fencing east of the Mississippi River and south of the Ohio and Potomac Rivers, the same as the rates in effect on special or manufactured iron, in the same territory. It is provided that the rates shall not exceed those to intermediate points. The minimum weight on wire fencings, fittings, posts, gates, etc., is 30,000 lb.

Studying Steel Suitable for Gages

Experimental work has been started by the Bureau of Standards in the study of the rate of or resistance to wear of steels when run in contact and without lubrication of any sort. The Amsler wear testing machine is being used for this investigation. The steels included in the preliminary studies form a series that has been submitted by the gage steel committee and which is being studied in detail to determine the suitability of the steels for gages. In gage work, the question of wear is of extreme importance.

More than 288,000 cars, trucks and buses were produced in the United States during June, according to Alfred Reeves, general manager the National Automobile Chamber of Commerce. This is a new high record in motor car production and is 12 per cent in advance of the May figures, 256,000. On this basis, Mr. Reeves predicts a total 1922 production of 2,000,000 motor vehicles. The total for the first six months passes the million mark by 137,000.

The Board of Public Service, St. Louis, has let the Worthington Pump & Machinery Corporation, Buffalo, the contract for the last of seven pumps for the Bissel Point high service station. The cost of the last unit is $199,000.

Heat-Temperature Curves of Metals

Basis for Average and Instantaneous Specific Heat Values Provided by German Laboratory Tests—New Specific Heats for Molten Metal

BY JOSEPH F. SHADGEN*

CALORIFIC energy influences all materials in different ways. Besides increasing their volumes, the most important effects of heat on bodies are the variation of their temperatures and often the transformation of their physical form.

Heating a solid material raises its temperature proportionately to the amount of energy involved. This increase varies with the nature of each material, and the thermal capacity of any material is the quantity of heat required to vary the temperature of unit mass of that material one degree from t to $t + 1$. The specific heat of the material is the ratio of its thermal capacity to that of pure water.

Certain solids change their physical forms when heated to certain temperatures, becoming liquid; these temperatures, also characteristic of each material, are called melting points, and the amount of heat necessary to cause the change of internal molecular equilibrium, without increase of temperature, is called heat of fusion. By adding further to the heat concentration, the temperature of the liquid rises to a second critical point, where gasification takes place; the liquid takes the form of a gas or a vapor. The temperatures characterizing these changes are called boiling points and the thermic energy absorbed, specific to the material, is called heat of vaporization.

These simple physical notions are known to practically all engineers, as they form the foundation of all industrial heat problems. Books dealing with the subject are filled with tables giving the results of numerous research investigations. Most of these tables concerning the commonly used metals date back to the early beginning of physical science, and are perpetuated, even in new issues of old publications, by the simple application of the law of least effort, because the majority of the recent test data is not only fractional, but also incoordinately spread in the multitude of technical magazines and reports of learned societies.

The notion of specific heat led to various complications; it was noticed by investigators that its value was not constant, for most materials, at all temperatures. This dependence necessitated further definitions, and that is the reason of the conception of mean specific heat and real specific heat. This can be best explained by a graphic analysis. In Fig. 1, ox represents the temperature and oy the amount of heat. By

Table I. Heat Content-Temperature Relations for Iron, Nickel and Cobalt

Temperature Deg. Cent.	Temperature Deg. Fahr.	Iron: Heat Content B.t.u. per Lb.	Iron: Heat Content Cal. per Kg.	Iron: Specific Heat Mean O° to T°	Iron: Specific Heat At T°	Nickel: Heat Content B.t.u. per Lb.	Nickel: Heat Content Cal. per Kg.	Nickel: Specific Heat Mean O° to T°	Nickel: Specific Heat At T°	Cobalt: Heat Content B.t.u. per Lb.	Cobalt: Heat Content Cal. per Kg.	Cobalt: Specific Heat Mean O° to T°	Cobalt: Specific Heat At T°
0	32	....	....	.....	0.1055	.....	.....	.....	0.1095	....	....	.....	0.0912
100	212	20.00	11.11	0.1111	0.1168	20.66	11.47	0.1147	0.1200	18.14	9.52	0.0952	0.0993
200	392	42.65	23.36	0.1168	0.1282	43.20	24.00	0.1200	0.1305	35.73	19.85	0.0993	0.1073
300	572	66.15	36.75	0.1225	0.1396	67.63	37.57	0.1252	0.1409	54.79	30.99	0.1033	0.1154
320	608	....	....	.....	.....	72.74	40.41	0.1262	0.1430	....	....	.....	.....
330	626	....	....	.....	.....	77.56	43.09	0.1306	0.1294	....	....	.....	.....
400	752	91.39	51.27	0.1282	0.1509	93.87	52.15	0.1304	0.1294	77.28	42.93	0.1073	0.1235
500	932	120.49	66.94	0.1339	0.1623	117.16	65.09	0.1302	0.1294	100.24	55.69	0.1114	0.1316
600	1,112	150.73	83.74	0.1396	0.1737	140.47	78.04	0.1301	0.1295	124.65	69.25	0.1154	0.1396
700	1,292	183.01	101.67	0.1452	0.1850	163.76	90.98	0.1300	0.1295	151.52	83.62	0.1195	0.1477
725	1,337	191.34	106.30	0.1467	0.1879	.....	....	.....	.....	....	....	.....	.....
745	1,373	201.99	112.21	0.1506	0.3760	.....	....	.....	.....	....	....	.....	.....
765	1,409	212.79	118.41	0.1548	0.1592	.....	....	.....	.....	....	....	.....	.....
785	1,445	222.01	123.34	0.1571	0.1592	.....	....	.....	.....	....	....	.....	.....
800	1,472	226.31	125.73	0.1572	0.1592	187.07	103.93	0.1299	0.1295	177.82	98.79	0.1235	0.1558
850	1,562	240.64	133.69	0.1573	0.1592	.....	....	.....	.....	....	....	.....	.....
900	1,652	254.93	141.65	0.1574	0.1592	210.38	116.88	0.1299	0.1295	206.59	114.77	0.1275	0.1639
919	1,686	260.42	144.68	0.1574	0.1592	.....	....	.....	.....	....	....	.....	.....
919	1,686	272.43	151.35	0.1647	0.1448	.....	....	.....	.....	....	....	.....	.....
950	1,742	280.51	155.84	0.1640	0.1448	.....	....	.....	.....	....	....	.....	.....
1,000	1,832	293.54	163.08	0.1630	0.1448	233.81	129.83	0.1298	0.1295	221.53	123.07	0.1295	0.1679
1,100	2,012	319.61	177.56	0.1614	0.1448	257.01	142.78	0.1298	0.1296	244.62	135.90	0.1359	0.1590
1,200	2,192	345.79	192.05	0.1600	0.1448	280.33	155.74	0.1298	0.1296	290.00	161.10	0.1465	0.1424
1,300	2,372	371.75	206.53	0.1589	0.1449	303.66	168.70	0.1298	0.1296	315.90	175.50	0.1463	0.1454
1,350	2,462	384.79	213.77	0.1584	0.1449	.....	.....	.....	.....	329.14	182.80	0.1463	0.1483
1,400	2,552	.....	.....	.....	.....	.....	.....	.....	.....	....	....	.....	.....
1,404.5	2,560	399.01	221.67	0.1578	0.1449	326.99	181.66	0.1298	0.1296	342.33	190.18	0.1465	0.1512
1,404.5	2,560	402.50	223.61	0.1592	0.2142	.....	....	.....	.....	....	....	.....	.....
1,451	2,643.8	.....	.....	.....	.....	.....	.....	.....	.....	....	....	.....	.....
1,451	2,643.8	.....	.....	.....	.....	338.89	188.27	0.1298	0.1296	....	....	.....	.....
1,478	2,692.4	.....	.....	.....	.....	439.83	244.35	0.1684	0.1338	....	....	.....	.....
1,478	2,692.4	.....	.....	.....	.....	.....	....	.....	.....	390.70	217.05	0.1469	0.1535
1,500	2,732	439.81	244.06	0.1627	0.2142	.....	.....	.....	.....	495.42	275.28	0.1863	0.1472
1,520	2,768	.....	.....	.....	.....	451.64	250.91	0.1673	0.1338	501.34	278.52	0.1857	0.1472
1,528	2,782.4	450.11	250.06	0.1637	0.2142	476.38	253.59	0.1668	0.1338	....	....	.....	.....
1,528	2,782.4	538.94	299.41	0.1959	0.1501	.....	....	.....	.....	....	....	.....	.....
1,600	2,912	558.40	310.22	0.1939	0.1501	.....	....	.....	.....	....	....	.....	.....
										527.84	293.24	0.1833	0.1472

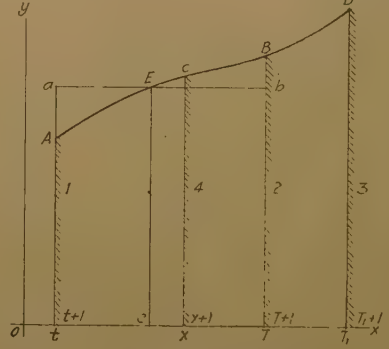


Fig. 1—Diagram to Illustrate Mean and Real Specific Heats

*Consulting engineer, New York.

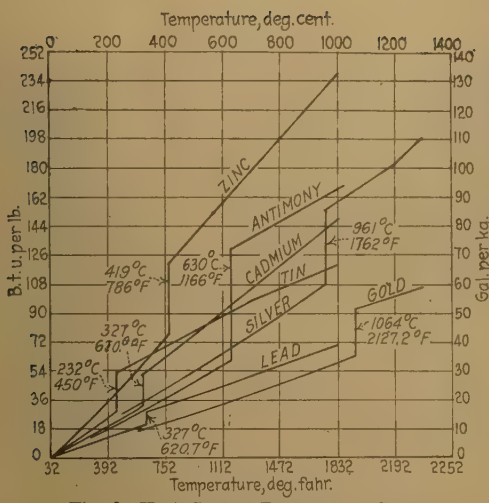


Fig. 2—Heat Content-Temperature Curves

successive determinations, with the help of a calorimeter, the curve *ACBD* has been plotted. The amount of heat contained in the unit weight of a certain material between t and T_1 is represented by the area $tACBDT_1t$. The real specific heat at the temperature t is represented by the area (1); the real specific heat at the temperature T is (2); at any point X it is (4). The heat between t and T is represented by $tACBTt$.

To avoid planimetric complication or the integration of difficult formulas, it was found practical to

Table II. Comparison of Results Obtained on Iron by Different Investigators

Investigator	Material	Carbon, Per Cent.	Heat of Fusion, Cal. per Kg.	Heat Content, Cal. per Kg.	Temperature, Deg. Cent.
Gruner	White pig iron	Not given	32 to 34	...	....
Wuest and Laval	Pig iron	3.4	....	277	1,220†
Springorum	Pig iron	3.3	....	246	1,203
Springorum	Steel	0.08	....	354	1,580
Schmidt	White pig iron	4.35	59	...	....
Gillhausen	Hematite	4.3	....	278	1,220†
Gillhausen	Thomas* pig iron	3.2	....	258	1,210†
Wuest, Meuthen & Durrer	pure iron	0.0	49.35	299.4	1,528
	pure iron	0.0	49.35	306.4	1,580

*Bessemer pig iron. †About.

assimilate the real area $tACBTt$ to a rectangle $taEbTt$ of the same surface, and the ordinate Ee was called mean specific heat between the temperatures t and T. It follows that, for all those substances whose specific heat is dependent upon the temperature, the two varieties of specific heats have to be considered, and consequently two tables will be required for complete information.

To avoid this complication, and to avoid in all calculations the multiplication $S(T-t)$, the writer has used in all his technical reports heat-content tables giving immediately the result of the above multiplication, without duplicate effort and source of error. The recognition of the multiple advantages of this practice was the reason for working up several data sheets along these lines for iron and aluminum; these were unfortunately very fractional, as no complete methodical investigations had been carried on along these lines.

Lately the writer's attention was drawn to the publication, by the German Engineers' Society, of the heat-content temperature curves of the industrially important metals, by Wuest, Meuthen and Duerrer, in which the three authors have done this work with typical German thoroughness and the help of large scale laboratory equipment. The completeness of this research work and its scope are far beyond the effort of any individual, no matter how willing. The practical importance of the data is the reason for this article. The writer makes no claim to originality, so far as the source of his information goes, but a rearrangement of the tables and their co-ordination, and condensation of the comment, was thought opportune. The linking up of the results with more general metaleographic knowledge was also thought necessary.

Remarkable is the range of temperatures of the tests, from 0 deg. to 1000 deg. C. (1832 deg. Fahr.) for the low-melting metals and 0 deg. to 1500 or 1600 deg. C. (2732 or 2912 deg. Fahr.) for the others. New in every way are the specific heats of the metals in the

Table III. Heat Content-Temperature Relations for Manganese

Temperature Degrees Cent.	Temperature Degrees Fahr.	Heat Content B.t.u. per Lb.	Heat Content Cal. per Kg.	Specific Heat Mean 0° to T°	Specific Heat At T°
0	32	.....	.....	.....	0.1204
100	212	22.12	12.29	0.1229	0.1254
200	392	45.16	25.09	0.1255	0.1305
300	572	69.07	38.37	0.1279	0.1356
400	752	93.98	52.21	0.1305	0.1407
500	932	119.75	66.53	0.1331	0.1458
600	1,112	146.46	81.37	0.1356	0.1509
700	1,292	174.08	96.71	0.1382	0.1559
800	1,472	202.61	112.56	0.1407	0.1610
900	1,652	232.11	128.95	0.1433	0.1661
1,000	1,832	262.40	145.78	0.1458	0.1712
1,050	1,922	277.92	154.40	0.1471	0.1737
1,070	1,958	284.11	157.89	0.1476	0.1747
1,130	2,066	346.68	192.60	0.1704	0.1770
1,200	2,192	369.00	204.99	0.1708	0.1770
1,210	2,210	372.17	206.76	0.1709	0.1770
1,230	2,246	445.26	247.37	0.2011	0.1980
1,250	2,282	452.39	251.33	0.2011	0.1980

Table IV. Heat Content-Temperature Relations for Antimony

Temperature Degrees Cent.	Temperature Degrees Fahr.	Heat Content B.t.u. per Lb.	Heat Content Cal. per Kg.	Specific Heat Mean 0° to T°	Specific Heat At T°
0	32	.....	.....	.....	0.0521
100	212	9.39	5.21	0.0521	0.0527
200	392	18.86	10.48	0.0524	0.0533
300	572	28.46	15.81	0.0527	0.0539
400	752	38.16	21.20	0.0530	0.0545
500	932	47.97	26.65	0.0533	0.0551
600	1,112	57.87	32.15	0.0536	0.0557
630	1,166	60.88	33.82	0.0537	0.0559
630	1,166	130.82	72.68	0.1154	0.0546
700	1,292	137.73	76.52	0.1093	0.0550
800	1,472	147.69	82.05	0.1026	0.0556
900	1,652	157.77	87.65	0.0974	0.0562
1,000	1,832	167.94	93.30	0.0933	0.0568

molten state. The investigators used for all tests the purest forms of metals commercially available. The most outstanding feature, however, is the influence of allotropic modifications on the heat content-temperature curve, an effect that, while not unknown to the metallographers, was absolutely ignored by others interested in the heat applications of the various metals.

For their tests the investigators used an apparatus

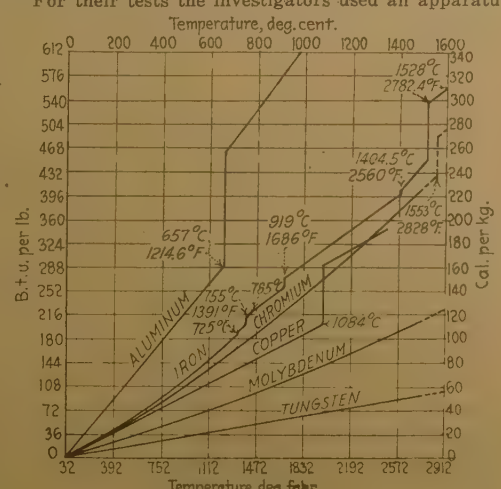


Fig. 3—The Iron Curve Is Shown to Have Nine Distinct Parts

Table V. Heat Content-Temperature Relations for Chromium, Molybdenum, Platinum and Tungsten

Temperature		Chromium				Molybdenum				Platinum				Tungsten			
		Heat Content		Specific Heat		Heat Content		Specific Heat		Heat Content		Specific Heat		Heat Content		Specific Heat	
Deg. Cent.	Deg. Fahr.	B.t.u. per lb.	Cal. per kg.	Mean 0° to T°	At T°	B.t.u. per lb.	Cal. per kg.	Mean 0° to T°	At T°	B.t.u. per lb.	Cal. per kg.	Mean 0° to T°	At T°	B.t.u. per lb.	Cal. per kg.	Mean 0° to T°	At T°
0	32	.....	.....	.....	0.1023	.....	.....	.....	0.0616	.....	.....	.....	0.0312	.....	.....	.....	0.0333
100	212	19.93	10.57	0.1057	0.1090	11.29	6.27	0.0627	0.0638	5.69	3.16	0.0316	0.0319	6.01	3.34	0.0334	0.0335
200	392	39.24	21.80	0.1090	0.1157	22.97	12.76	0.0638	0.0660	11.48	6.38	0.0319	0.0326	12.04	6.69	0.0335	0.0337
300	572	60.68	33.71	0.1124	0.1224	35.06	19.48	0.0649	0.0682	17.42	9.68	0.0323	0.0333	18.13	10.07	0.0336	0.0339
400	752	83.32	46.29	0.1157	0.1291	47.54	26.41	0.0660	0.0704	23.49	13.05	0.0326	0.0340	24.25	13.47	0.0337	0.0341
500	932	107.15	59.53	0.1191	0.1358	60.41	33.56	0.0671	0.0726	29.68	16.49	0.0329	0.0348	30.40	16.89	0.0338	0.0343
600	1,112	132.21	73.45	0.1224	0.1425	73.67	40.93	0.0682	0.0748	36.00	20.00	0.0333	0.0355	36.61	20.34	0.0339	0.0345
700	1,292	158.45	88.03	0.1258	0.1492	87.32	48.51	0.0693	0.0770	42.44	23.58	0.0337	0.0362	42.84	23.80	0.0340	0.0348
800	1,472	185.90	103.28	0.1291	0.1559	101.41	56.34	0.0704	0.0792	49.01	27.23	0.0340	0.0369	49.07	27.26	0.0341	0.0349
900	1,652	214.58	119.21	0.1324	0.1626	115.85	64.36	0.0715	0.0814	55.73	30.96	0.0344	0.0376	55.42	30.79	0.0342	0.0352
1,000	1,832	244.44	135.80	0.1358	0.1693	130.70	72.61	0.0726	0.0836	62.55	34.75	0.0348	0.0383	61.78	34.32	0.0343	0.0354
1,100	2,012	275.51	153.06	0.1392	0.1760	145.99	81.08	0.0737	0.0858	69.50	38.61	0.0351	0.0390	68.17	37.87	0.0344	0.0356
1,200	2,192	307.78	170.99	0.1425	0.1827	161.58	89.77	0.0748	0.0880	76.59	42.55	0.0355	0.0397	74.59	41.44	0.0345	0.0358
1,300	2,372	341.26	189.59	0.1458	0.1894	177.64	98.69	0.0759	0.0902	83.81	46.56	0.0358	0.0404	81.05	45.03	0.0346	0.0360
1,400	2,552	375.95	208.86	0.1492	0.1960	184.06	107.81	0.0770	0.0924	91.13	50.63	0.0362	0.0411	86.59	48.65	0.0347	0.0362
1,500	2,732	411.84	228.80	0.1525	0.2027	210.89	117.16	0.0781	0.0946	98.60	54.78	0.0365	0.0418	94.10	52.28	0.0348	0.0365
*1,553	2,828	427.32	237.40	0.1530													
*1,553	2,828	466.00	270.00	0.1738													
*1,600	2,912	497.52	276.40	0.1727													

*These three lines figured, approximately, by author.

similar to the vacuum calorimeter of Oberhoffer, that is, a combination of an ice calorimeter with an electric vacuum furnace. For very high temperature, modifications were made to obtain a quick rise in temperature so as to avoid all side effects. For further details it will be necessary to refer to the above mentioned source, which has also a most complete and up-to-date compilation of the literature on the subject.

All tables give the results in the calorie-Centigrade system, and the corresponding results in the B.t.u.-Fahrenheit system. They indicate for the given temperatures the heat content, the mean specific heat from 0 deg. to T, and the real specific heat at T. The calorie columns were taken from the various pages of the above-mentioned source; the others were figured by the writer. For the change of units, 1 kg.-calorie per kilogram of material was assumed equivalent to 1.8 B.t.u. per lb.; or 1 B.t.u. per lb., the same as 0.555 kg. cal. per kg.; in other words, in the ratio of the temperature scales (1 large calorie or kilogram calorie equals 3.968 B.t.u., or 1 B.t.u. equals 0.252 kg. cal.). The curves are plotted with the temperatures as abscissæ and the amounts of heat as ordinates. Both unit systems are given.

Information concerning iron is most important, and Figs. 3 and 5 as well as Tables I and II deal with this most useful metal. For the tests an electrolytic iron was secured with practically no impurity, even the gases having been purged out by a special process. It was found that the heat content temperature curve was made up of nine distinct parts. From 0 deg. C. to 725 deg. C. (1337 deg. Fahr.) there was an uninterrupted slightly parabolic line, corresponding to the crystallization of the metal. After that temperature a somewhat steeper branch ran from 725 deg. C. to 785 deg. C. (1445 deg. Fahr.) during which a change in the molecular structure took place; this corresponds to the gradual formation of the β variety of iron, stable at those higher temperatures. After 785 deg. C. practically a straight line occurred, until at 919 deg. C. (1686 deg. Fahr.) a pretty nearly definite decalescence point was characterized by a heat jump of 6.64 cal. per kg. (11.95 B. t. u. per lb.). This indicates the recrystallization of the mass into the α variety.

From 919 deg. C., the fifth part of the curve is practically straight, with no disturbance until 1404.5 deg. C. (2560 deg. Fahr.), at which temperature a third critical point is noticed very clearly by a sudden heat absorption of 1.94 cal. per kg. (3.5 B. t. u. per lb). At this temperature another allotropic change takes place, a new resetting of molecular forces, which is called the δ variety of iron. From 1404.5 deg. C. the diagram continues as a straight line up to 1528 deg. C. (2782.4 deg. Fahr.), where the melting phenomena take place, accompanied by the large absorption of 49.35 cal. per kg. (88.83 B. t. u. per lb.) without increase in temperature. This quantity represents the heat of fusion, which is in fact only a sudden increase in the specific heat. After all molecules have found

Table VI. Heat Content-Temperature Relations for Cadmium, Lead, Tin and Zinc

Temperature		Cadmium				Lead				Tin				Zinc			
		Heat Content		Specific Heat		Heat Content		Specific Heat		Heat Content		Specific Heat		Heat Content		Specific Heat	
Deg. Cent.	Deg. Fahr.	B.t.u. per lb.	Cal. per kg.	Mean 0° to T°	At T°	B.t.u. per lb.	Cal. per kg.	Mean 0° to T°	At T°	B.t.u. per lb.	Cal. per kg.	Mean 0° to T°	At T°	B.t.u. per lb.	Cal. per kg.	Mean 0° to T°	At T°
0	0	.....	.....	.....	0.0555	.....	.....	.....	0.0359	.....	.....	.....	0.0683	.....	.....	.....	0.0878
100	212	10.10	5.61	0.0561	0.0568	6.26	3.48	0.0348	0.0336	12.24	6.83	0.0683	0.0683	16.58	9.21	0.0921	0.0965
200	392	20.43	11.35	0.0568	0.0580	13.10	6.72	0.0336	0.0313	24.59	13.66	0.0683	0.0683	34.72	19.29	0.0965	0.1052
232	450	.....	.....	.....	.....	.....	.....	.....	.....	28.51	15.84	0.0683	0.0683	.....	.....	.....	.....
232	450	.....	.....	.....	.....	.....	.....	.....	.....	53.33	29.63	0.1277	0.0620	.....	.....	.....	.....
300	572	31.00	17.22	0.0574	0.0593	17.52	9.74	0.0325	0.0290	60.73	33.74	0.1125	0.0592	54.43	30.24	0.1008	0.1139
321	610	33.23	18.46	0.0575	0.0595	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
321	610	52.686	29.27	0.0912	0.0736	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
327	620.6	.....	.....	.....	.....	18.91	10.51	0.0322	0.0284	.....	.....	.....	.....	.....	.....	.....	.....
327	620.6	.....	.....	.....	.....	28.76	15.98	0.0489	0.0270	.....	.....	.....	.....	.....	.....	.....	.....
400	752	63.23	35.13	0.0878	0.0746	32.92	18.29	0.0457	0.0266	72.06	39.48	0.0987	0.0556	75.74	42.07	0.1052	0.1226
419	786	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	79.94	44.41	0.1060	0.1242
419	786	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	121.36	67.42	0.1609	0.1199
500	932	77.13	42.65	0.0853	0.0769	38.72	21.51	0.0430	0.0259	80.73	44.85	0.0897	0.0519	138.65	77.03	0.1541	0.1173
600	1,112	90.54	50.30	0.0838	0.0772	44.62	24.79	0.0413	0.0252	89.73	49.85	0.0831	0.0482	159.50	88.61	0.1477	0.1141
700	1,292	104.544	58.08	0.0830	0.0784	50.65	28.14	0.0402	0.0246	98.08	54.49	0.0793	0.0446	178.49	99.16	0.1427	0.1109
800	1,472	118.76	65.98	0.0825	0.0799	56.81	31.56	0.0394	0.0239	105.77	58.76	0.0735	0.0409	199.42	110.79	0.1385	0.1076
900	1,652	133.25	74.03	0.0823	0.0810	63.10	35.05	0.0389	0.0233	112.79	62.66	0.0696	0.0373	218.52	121.40	0.1349	0.1044
1,000	1,832	147.94	82.19	0.0822	0.0823	69.43	38.57	0.0386	0.0226	119.36	66.20	0.0662	0.0336	237.04	131.69	0.1317	0.1012

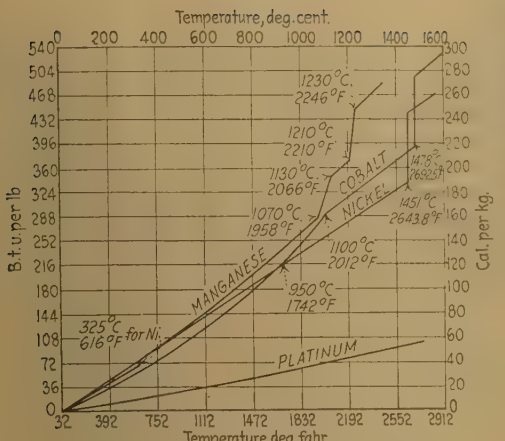


Fig. 4—Heat Content-Temperature Curves

their new balance, the curve indicates a steady increasing line showing the conditions of the superheated molten metal.

These results indicate that the specific heats not only vary with temperatures, but are also subject to irregularities pertaining to allotropic changes within the mass of the metal. While the few theories on the mechanism of these recrystallizations and their balance are still very conflicting, the practical thermic effect is undeniable, and has to be accepted at full face value. It must be stated that the first caloric disturbance, around 725 deg. C. (1337 deg. Fahr.), is accompanied by the loss of the magnetic qualities of the metal.

Similar curves are not available for the industrial forms of iron, such as soft steel containing 0.1, 0.2, 0.5, etc. per cent of carbon. It is undeniable that such investigations would be of enormous benefit to industry, but the metallographic researches have given us the well known Roberts-Austen diagram of Fig. 5, which, used in conjunction with the heat content-temperature curve, will prove of great value. Instead of the various allotropic changes of iron, the well known forms of iron carbon combinations and solutions have to find their internal balance and relative solubility, one in the other. The phenomena change very little in their nature, but the critical temperatures vary according to the lines given in the diagram.

National research laboratories have here a great opportunity to earn, besides scientific reputation, the thankfulness of the whole technical world by carrying out similar investigations. Table II is a comparative compilation of all experimental results of the literature on the subject, which shows that, in spite of the differences, the above data are very acceptable for industrial purposes. The recognition of the heat variations at the so-called critical points has up to now been the monopoly of the metallographer of the specialist—and this knowledge has hardly diffused beyond this narrow circle.

It is useless to emphasize the practical importance and great value of a better understanding of the interrelation of the thermic and crystallographic phenomena, and a generalization of this remarkable knowledge is imperative. The newly developed industry of alloys, with its enormous possibilities, and the interesting and efficient application of electric heating, will require a thorough knowledge of these data. Recently developed heat-treating methods, like the hump method of Leeds & Northrup, are only the logical application of the result of this science in a practical, foolproof form. In fact, it may be stated, without exaggeration or error, that all irregularities in the pyrometer-time curves, without reason from outside, are due to variation of the specific heat in correlation with internal changes within the mass of the metal.

Manganese, nickel and cobalt are dealt with on Fig. 4 and in Tables I and III. These three metals are closely related to iron, and present also irregularities in their heat content-temperature curves indicating allotropic transformations and recrystallizations; some of them are sudden and clearly defined, others are gradual and progressive. Nickel has a perturbation

Table VII. Heat-Content-Temperature Relations for Aluminum, Copper, Gold and Silver

Temperature		Aluminum				Copper				Gold				Silver			
		Heat Content		Specific Heat		Heat Content		Specific Heat		Heat Content		Specific Heat		Heat Content		Specific Heat	
Deg. Cent.	Deg. Fahr.	B.t.u. per lb.	Cal. per kg.	Mean 0° to $T°$	At $T°$	B.t.u. per lb.	Cal. per kg.	Mean 0° to $T°$	At $T°$	B.t.u. per lb.	Cal. per kg.	Mean 0° to $T°$	At $T°$	B.t.u. per lb.	Cal. per kg.	Mean 0° to $T°$	At $T°$
0	32	.....	.....	.....	0.2220	.....	.....	.....	0.1008	.....	.....	.....	0.0317	.....	.....	.....	0.0573
100	212	40.66	22.59	0.2259	0.2297	18.20	10.11	0.1011	0.1014	5.72	3.18	0.0318	0.0320	10.40	5.78	0.0578	0.0583
200	392	82.69	45.94	0.2297	0.2374	36.51	20.28	0.1014	0.1020	11.50	6.39	0.0320	0.0322	20.90	11.64	0.0582	0.0594
300	572	126.12	70.07	0.2336	0.2451	54.92	30.51	0.1017	0.1026	16.85	9.36	0.0321	0.0325	31.81	17.67	0.0589	0.0605
400	752	170.95	94.97	0.2374	0.2529	73.44	40.80	0.1020	0.1032	23.20	12.89	0.0322	0.0328	42.80	23.78	0.0595	0.0616
500	932	217.15	120.64	0.2413	0.2606	92.09	51.16	0.1023	0.1038	29.12	16.18	0.0324	0.0330	54.00	30.00	0.0600	0.0627
600	1,112	264.76	147.09	0.2452	0.2683	10.74	61.57	0.1026	0.1045	35.08	19.49	0.0325	0.0333	65.38	36.32	0.0605	0.0638
657	1,214.6	292.50	162.50	0.2473	0.2727	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
657	1,214.6	461.63	256.46	0.3904	0.2502	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
700	1,292	481.09	267.27	0.3818	0.2523	129.69	72.05	0.1029	0.1051	41.09	22.83	0.0326	0.0335	76.97	42.76	0.0611	0.0649
800	1,472	526.93	292.74	0.3659	0.2571	148.64	82.58	0.1032	0.1057	47.36	26.20	0.0328	0.0338	88.76	49.31	0.0616	0.0660
900	1,652	573.66	318.70	0.3541	0.2619	167.72	93.18	0.1035	0.1063	53.26	29.59	0.0329	0.0341	100.73	55.96	0.0622	0.0670
961	1,762	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	108.14	60.08	0.0625	0.0678
961	1,762	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	154.98	86.10	0.0896	0.0615
1,000	1,832	621.26	345.14	0.3451	0.2667	186.91	103.84	0.1038	0.1069	60.02	33.01	0.0330	0.0343	159.37	88.54	0.0885	0.0637
1,050	1,922	.....	.....	.....	.....	.....	.....	.....	.....	62.51	34.73	0.0331	0.0344	.....	.....	.....	.....
1,064	1,947.2	.....	.....	.....	.....	.....	.....	.....	.....	63.38	35.21	0.0331	0.0345	.....	.....	.....	.....
1,064	1,947.2	.....	.....	.....	.....	.....	.....	.....	.....	91.94	51.08	0.0480	0.0323	.....	.....	.....	.....
1,084	1,983	.....	.....	.....	.....	203.11	112.84	0.1041	0.1074	.....	.....	.....	.....	.....	.....	.....	.....
1,084	1,983	.....	.....	.....	.....	294.94	163.81	0.1511	0.1007	.....	.....	.....	.....	.....	.....	.....	.....
1,100	2,012	.....	.....	.....	.....	295.99	164.44	0.1495	0.1028	94.05	52.25	0.0475	0.0329	171.34	95.19	0.0865	0.0694
1,200	2,192	.....	.....	.....	.....	315.68	175.38	0.1462	0.1159	100.13	55.63	0.0464	0.0346	182.34	102.41	0.0853	0.0750
1,300	2,372	.....	.....	.....	.....	337.72	187.62	0.1443	0.1291	107.50	59.17	0.0455	0.0364	198.34	110.19	0.0848	0.0807

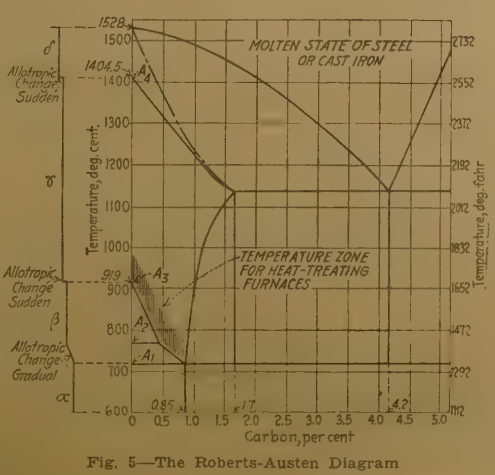


Fig. 5—The Roberts-Austen Diagram

at 325 deg. C. (about 615 deg. Fahr.) accompanied by the loss of magnetic properties. Manganese has, besides, a gradual modification at about 1100 deg. C. (2000 deg. Fahr.)—the peculiarity of melting within a range of temperatures, rather than at a definite melting point.

Chromium, molybdenum and tungsten are shown on Fig. 3 and platinum on Fig. 4; and the results are compiled in Table V. These metals do not show any disturbances in their diagrams. Chromium has been investigated up to only 1500 deg. C. (2732 deg. Fahr.); the dotted continuation is approximated, and the three last lines of its table are not absolutely correct.

Table VIII. Condensed Sequence of Melting Points and Fusion Points of Metals

Metal	Temperature of Fusion		Heat of Fusion		Temp'ture of Vaporization	
	Deg. Cent.	Deg. Fahr.	Cal. per Kg.	B.t.u. per Lb.	Deg. Cent.	Deg. Fahr.
Tin	232	450	13.80	24.80	2,270	4,118
Bismuth	270	518	10.32	18.57	1,420	2,588
Cadmium	321	610	10.81	19.47	778	1,432
Lead	327	620.6	5.47	9.85	1,550	2,822
Zinc	419	786	23.01	41.42	920	1,688
Antimony	630	1,166	38.86	69.95	1,440	2,624
Aluminum	657	1,214.6	93.96	169.12	1,800	3,272
Silver	961	1,762	26.00	46.80	1,955	3,551
Gold	1,064	1,927	15.87	28.56	2,200	3,992
Copper	1,084	1,983	50.97	91.75	2,310	4,190
Manganese	1,220	2,228	36.63	65.93	....	....
Nickel	1,451	2,644	56.08	101.92	....	....
Cobalt	1,478	2,692	58.23	105.71	....	....
Iron	1,528	2,782	49.35	88.83	....	....
Chromium	1,553	2,828	32.00	58.60	....	....
Platinum	1,750	3,182	27.18	48.92	....	....

The results of the investigation of the low-temperature melting metals are given on Figs. 2 and 3, and Tables IV, VI and VII contain the compiled data. No changes take place and all the diagrams are made up of three links only, due to the melting phenomena. Worth mentioning is the large heat capacity of aluminum, the light density metal.

Table VIII condenses in order the melting points of the metals investigated and the corresponding heats of fusion. Added are several boiling points at atmospheric pressure. These were determined by special tests, as the circumstances of the previous research, in inclosed quartz tubes under vacuum, did not allow these phenomena to interfere with the results. That is why, for certain metals, the curves do not show a disturbance, in spite of temperatures higher than the boiling points.

Bonuses Given to Dismissed Employees

How one of the leading shipbuilding companies in Japan successfully reduced the number of its workers by about one-fifth without labor difficulties is explained in a recent report of Vice-Consul Irvin C. Carrell at Nagasaki. The number of employees at the beginning of this year was in excess of the number needed for the building program. In February the company announced that in addition to the usual bonus given Japanese workmen upon resignation or dismissal, employees tendering their resignations within 10 days would be given a special bonus in addition, of cash amounting to 60 to 120 days extra pay and traveling expenses for themselves and families back to the workman's native city. The scale was worked out as follows: For 1 year's service 10 days pay, and 10 days additional for each year of service up to 5 years. For 10 years of service 150 days pay were given and this scale ranged up to 1520 days pay for 40 years of service.

The Youngstown Steel Co., Youngstown, Ohio, has awarded contracts for one 1200 hp. motor and one 1500 hp. motor to the Westinghouse Electric & Mfg. Co., Pittsburgh. The equipment is to be used in the mechanical puddling plant being erected by the company at Warren, Ohio.

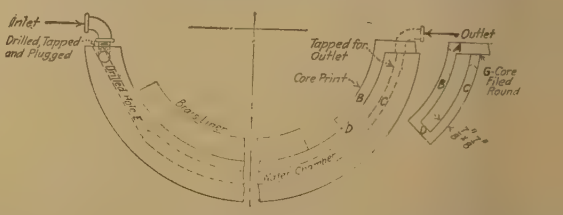
Improved Casting for Mill Journals

BY M. E. DUGGAN

It is not uncommon to have to renew mill roll journal boxes within twenty-four hours after installation. I have seen two boxes taken out and replaced in a 10-hr. run.

The large amount of machine labor involved in preparing one of these water-cooled boxes for use can be materially reduced by using a core, as shown in the illustration, in place of the usual machining operation.

The drawing shows a standard mill roll water-cooled journal box with inlet and outlet at the top. The left-hand or inlet side shows the usual machining operation; the right-hand side shows the core arrangement suggested by the writer. Ordinarily a ¾-in. hole is drilled into the water chamber—a distance of 5 to 8 in.—as shown at *F*, and plugged at the top. A hole is then drilled and tapped square with the top face and a little to the side of the hole *F*, connecting it with the inlet.



Drilled, Tapped and Plugged Outlet on Left; Simpler Cored Outlet at Right

On the right-hand side, *A B* is the core print, *C* is the cored outlet port and *D* is a cored hole through the casting providing a support for the core, which is shown separately. Dimensions are as shown with the square section filed round at *G* so that the port can be drilled and tapped to receive the outlet fitting—a much simpler operation than its alternative.

Mechanical Working of Invar

Invar steel is very difficult to work mechanically but is an important alloy for certain classes of work where very low coefficient of expansion is desired. In order to see whether it could not be worked successfully, four small ingots of invar were prepared by the metallurgical division of the Bureau of Standards. The first attempt at forging was unsuccessful, the ingot cracking and breaking under the forging press. The second attempt was quite satisfactory as a result of very careful handling during forging operations.

It was found necessary to give very light reductions and not allow the forging temperature to drop below 1000 deg. C during the first reduction. This ingot was forged to a ⅜-in. rod, and a portion of this was cut off and machined to a ¼-in. rod. This has been cold drawn with two intermediate annealings down to approximately 1/16-in. wire. It is being carried further with the idea of determining how fine a wire of invar may be made.

Number Wood Screw Sizes Reduced

On June 20, a second conference of wood screw manufacturers was held at the Bureau of Standards. Twelve of the largest wood screw manufacturers were represented. A new list of standard sizes was adopted which reduces the sizes of both steel and brass screws from 555 to 291, a reduction of 47 per cent The previous standards for tolerance in lengths of round head screws were revised.

Specifications for wood screws have been written as an outcome of the above conference and are now under consideration by the hardware committee of the Federal Specifications Board. It is expected that these specifications will be published shortly as a Government standard.

Government Takes Decisive Action

Plans to Prevent Distress Due to Railroad and Coal Strikes Are Adopted After Washington Conference

WASHINGTON, July 25.—The iron and steel and allied industries of the United States are expected to suffer severely from the rigid plans adopted by the Government to meet the acute situation growing out of the railroad and coal strikes. Effective at 12 o'clock tonight, orders issued this afternoon by the Interstate Commerce Commission establish a priority list for the dispatch of traffic to be observed by all railroads East of the Mississippi in respect to essential consumers. Iron and steel and allied industries not being so classified, they will take the lowest grade with reference to shipments of their products and receipt of coal.

Fitting in with this plan of the commission is one adopted as the result of a conference yesterday between Secretary of Commerce Hoover, representatives of railroads and coal operators providing for the distribution of current coal production and for prevention of unfair prices. This latter plan, to be reported back to coal operators, is expected to be put in operation within 36 hours.

Plans Outlined

The plans outlined are so sweeping in their character that cars may be assigned as directed by the commission, and coal obtained for consumers on the preference and priority list. Moreover, private cars may be commandeered and likewise coal from private mines may be taken for the purpose of supplying the consumers given priority and preference, if necessity demands it. The priority and preference list is as follows: Food for human consumption, feed for livestock, livestock, perishable products, coal, coke and fuel oil. It is intended that fuel be given preferential movement to the consumers on the priority list in the following preferred order: Railroads, bunkering for ships, public utilities directly serving the general public, electric power and light, gas, water and sewer works, ice plants, hospitals, Federal, State, county and municipal governments and their hospitals, schools, and other public institutions.

Priority List Created

In the creation of the priority list for the distribution of coal, the Interstate Commerce Commission said that in the supply of cars to mines upon the lines of any coal-loading carrier the railroad should observe the preference and priorities established in five classes as follows: For such special purposes as may from time to time be designated by the commission, the list previously mentioned, beginning with fuel for railroads, coal for trans-shipment by water from Lake Erie ports to Lake Superior ports to care for the needs of the Northwest, this covering coal from mines in Pennsylvania, Ohio, West Virginia, Kentucky, Tennessee and Alabama, commercial sizes of coal for domestic use. Lastly comes the classification "All other purposes," which includes, while not specified, among others, iron and steel and allied industries. The latter will be required to wait for coal until after the so-called essential consumers have been supplied.

Car Service Orders

The car service orders of the commission were issued upon its declaration of a national emergency, and the railroads of the country east of the Mississippi were accordingly placed upon a footing that in many respects is as serious as in a time of war.

Traffic is to be moved by the most available routes designed to expedite shipments and prevent congestion regardless of the routing that may be ordered by shippers or the ownership of the cars. The declaration of an emergency was made in one order, while another established the preferences and priorities. The wording is somewhat different from that of the car service order of May 20, 1920, and is phrased so as to avoid, if possible, controversies which followed the issuance of the order of 1920. The priority order provides that in the event carriers east of the Mississippi River are not able to transport all the tonnage offered to them within a reasonable time, they are to put aside the traffic of industries other than those engaged in the production of food and foodstuffs, livestock, perishable products, coal, coke and fuel oil. Coke ovens operating under this condition can be compelled by means of the distribution of cars to make shipments where directed. Iron and steel and other shipments can be withheld if cars are required for so-called essential purposes.

Directions to Railroads

The commission directed all railroads to place an embargo on the receipt of coal or other freight transported in open top cars suitable for coal loading and against the placement of such open top cars when any consignee fails to unload the coal or other freight within 24 hours after cars are placed. This is not to interfere with the movement of coal to tidewater or to the Great Lakes for trans-shipments by water. No coal included in any of the special classes is subject to reconsignment or diversion, except for some purpose in the same or superior class in the priority prescribed. Railroads are divided into coal loading and non-coal loading classes and orders are specified for their operation east of the Mississippi River, although the order affects all railroads of the country where the occasion may require it. A machine for the administration of the car orders will be set up by the commission.

The Hoover Plan

The organization being set up through the Hoover plan is distinct. It provides for a committee in Washington, to be appointed by the President, of representatives of the Department of Commerce, the Interstate Commerce Commission, the Department of Justice, and the Department of Interior, to be designated by the presidential committee. It will have general supervision of the measures adopted. Next will be an administrative committee, comprising representatives of the presidential committee, together with representatives of coal operators, and railroads, and where necessary of the larger consuming groups. The presidential committee will establish a representative in each coal producing district and appoint a committee of operators in each district to be nominated by the district operators' association or independent operators. In case of failure of the operators to take such action, the presidential committee may appoint such operators as it sees fit on such committee. The presidential committee will co-operate with the Interstate Commerce Commission in carrying out preferential orders to be issued by the commission. Governmental representatives in the districts in co-operation with the district committee will advise the commission as to the local car movement, and operators will proceed with their usual business until they are affected by preference

orders. It is expected that the district committees under the authority of the presidential committee will recommend allotment of cars on the basis of those who conform to the fair prices to be agreed upon with the presidential committee, the purpose being to give preference in car supply to mines living up to the price agreed upon with Secretary Hoover. Railroads will be asked to appoint a representative to deal with purchases of railroad fuel.

Should coal be moved at once to the preferred classes, it is estimated that it would take practically all of the present output, which is said to be at the rate of 4,000,000 tons this week, leaving other industries to depend entirely upon their stocks. Moreover the contracts the latter have had for coal can be abrogated, if necessary.

Further Reduction in Coal Output

WASHINGTON, July 25.—Further sharp restriction of coal production is reported by the Geological Survey, which says that the week of July 17-22 may set a new low record since the strike began. Reports indicate that output cannot exceed 3,600,000 tons, against a minimum of 3,575,000 tons in the third week of the strike and a maximum of 5,363,000 tons in the twelfth week. The chief factor in the continued curtailment is the railroad shopmen's strike. Practically no anthracite coal is being mined. At the present rate of production, it is from 5,000,000 to 6,000,000 tons weekly below normal. There was a gradual daily decline of car loadings during the sixteenth week of the strike, going down from 12,657 cars on Monday to 10,800 on Thursday, the latest day of the Geological Survey record. The cause of the decrease was traffic congestion on railroads serving the non-union fields. In the southern West Virginia and Eastern Kentucky from which the bulk of the country's supply during the strike has come, almost every field reported acute transportation disability. In Virginia, western Kentucky and Tennessee the interruption of car supply was less serious and in Alabama and the Far West increased. No important change in the number of men at work during the sixteenth week took place. Production in non-union Pennsylvania during the first half of the week showed a slight decrease from the week preceding.

The total number of unbilled cars at the mines on July 15 was only 2,405 of which 621 were at anthracite mines. For a group of 22 of the largest carriers, holding about 75 per cent of the total number of unbilled loads, there were only 1079 cars.

Developments in Connellsville Region

UNIONTOWN, PA., July 22.—Railroad and coal strikes are cutting into the fuel production and business conditions generally in the Connellsville bituminous region. Coal production is being affected more seriously now by the railroad strike than by the sympathetic strike of the coal miners who have affiliated with the United Mine Workers. Additional miners daily are being brought into the Connellsville region and operators are attempting to increase their production. The H. C. Frick Coke Co. has advanced its output to around 35 per cent of normal, but operating independent plants have not reached this proportion. W. J. Rainey, Inc., posted notices this week that its plants would resume in accordance with the President's invitations to operators. The Rainey notices read:

> The President of the United States has ordered all mines to start at once and will furnish complete protection. The Government expects you to return to work immediately or your places will be filled by others.

So far there has been no response to these notices. None was expected, however, until around the first of the week and the situation at the Rainey plants is largely one of watchful waiting. Four of the six Rainey plants have been idle since April 1. It is understood that some of the other companies in the region are considering posting similar notices.

An attempt was made this week to blow up the tipple at Lemont mine of the H. C. Frick Coke Co. A heavy charge of dynamite was exploded about 200 ft. from the tipple, but aside from tearing a hole in the ground, did no damage. When a suspicious person was seen near the Dearth tipple of the Frick company, guards ordered him to stop. He ran and they fired at him. A fusillade of some 75 to 100 shots fired from the hillside overlooking the plant followed, presumably by strikers in tent colonies on the hill. The home of a guard at Hopwood was destroyed by fire during absence of the family, incendiarism being charged. Two coal trains, one on the Smithfield branch of the Baltimore & Ohio and the other on the M. R. R. Railroad were wrecked last night. It is declared that switches had been tampered with. One brakeman was injured.

The coroner's jury investigating the recent tipple killing of three strikers at the New Geneva plant of the Atlantic Coal Co. disagreed as to Leroy S. Lincoln, chief deputy. Two other deputies were exonerated. Lincoln was later held under $15,000 bail for the grand jury on three charges of voluntary manslaughter. Two members of the coroner's jury were members of the United Mine Workers. The vote is said to have been five to one for exonerating Lincoln. It is the first time in the history of the county that a coroner's jury has failed to agree.

GERMAN MACHINE-TOOL MEETING

Manufacturers Discuss the Effects of Adverse Price Situation—Unable to Compete in Many Markets

The serious effect of the present price level on export trade was discussed at the annual meeting in Berlin of the Association of German Machine Tool Manufacturers, says a report from Commercial Attache Herring at Berlin. The association, it is stated, includes 700 plants employing 125,000 workers. Although in the closing months of 1921 the industry experienced a boom, it was asserted at the meeting that world market prices have recently been reached and even exceeded in certain lines, resulting in a decline of 80 per cent in export orders since Jan. 1 of this year.

The difficulties which an improvement of the mark would occasion, since labor costs could not be immediately reduced without serious controversy, were dwelt upon and the present difficulties of obtaining a regular and adequate supply of materials, particularly coal, was emphasized. Complaint was made of the lack of skilled labor. The shifting price system (gleitende Preise) was recognized as necessary under present conditions, and invoicing of export sales in foreign currencies was recommended. The foreign-trade control by the Aussenhandelsstelle of the machine-tool industry was commended, having resulted, it was said, in preventing exchange dumping abroad.

Exports of machine tools to Italy, Switzerland, France, Belgium and Spain, it was pointed out, have virtually ceased, since price competition in these countries on a c.i.f. duty paid basis is no longer possible.

Two pamphlets have recently been issued by the Electric Furnace Construction Co., Philadelphia. One describes the electro steam generator and the other the latest developments and improvements in the Greaves-Etchells electric melting and refining furnaces. Particular mention is made of the recent improvements which make it possible for all of the electric current to be put either entirely through the top electrodes or, by change of position of the switch, through the whole of the furnace hearth. Other specialties are discussed.

The Hydraulic Society has issued a second edition of its pamphlet entitled, "Trade Standards in the Pump Industry." Additional tables and explanatory data have been added to this compilation of standards of manufacture and engineering practice in the pump industry. There is also a revised list of members of the society. Copies of the pamphlet may be secured from the secretary, C. H. Rohrbach, 50 Church Street, New York.

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The Steel Merger Decisions

For many years big business has been groping in the dark because it has not known its rights. Beginning with the days of President Roosevelt, there was strong sentiment, which had much justification, against large combinations of companies, and this feeling reached its climax under the Taft administration with the filing of the dissolution suit against the United States Steel Corporation and continued under President Wilson until war came. As one prominent ore man expressed it: "Men of the same line of products can hardly meet on the street for a friendly conversation without placing themselves under suspicion of getting together in wicked alliance to fix prices." When war came, all was changed. As another industrial leader said: "Nowadays we are invited by the Government to violate the law." In other words, manufacturers were urgently requested to unite in regulation of both production and distribution of their products. And they did.

After the signing of the armistice, business was again surrounded by clouds of uncertainty. No one knew what the policies of the Wilson administration would be and there was little if any clearing of the skies after Warren G. Harding entered the White House. Many times, under the various administrations, it had been urged that business be provided some chart to guide it and that organizers of proposed mergers be told whether or not they were proceeding illegally. Generally the answer given was, in substance, that if the Government believed that the Sherman act or the Clayton act was being violated it would be heard from. Perhaps there would have been no departure from this policy of acting only after the fact, had not Senator La Follette forced the hand of the Department of Justice with his ranting resolution alleging an intended monopoly in the steel industry.

In responding to the Senate resolution, which to one type of public men would have been a not unwelcome invitation to corporation baiting, the Attorney-General has acted with courage seldom seen in public officials. He declares that the two proposed mergers of independent companies—one of Bethlehem and Lackawanna and the other of Midvale, Republic and Inland companies—are not in contravention of the Sherman, the Clayton or the Webb law. There is no evasion, no mincing of words. As to the former, the Attorney General emphatically says:

> I am persuaded that the motive which prompts the Bethlehem to acquire the Lackawanna plant is the sole desire to secure greater efficiency and economy in the production, handling, and distribution of steel products, and that the thought of acquiring a monopoly or of enhancing prices was never present. The whole transaction from beginning to end impresses me as being thoroughly clean, honest and straightforward.

As to the Midvale-Republic-Inland merger, the Attorney-General says in concluding his review of the proposal:

> Instead of being in restraint of trade, the new combination will be in furtherance of trade. Its formation has, I believe, been prompted in a great measure by the heavy losses which all of these companies sustained following the marked depression in the steel industry which began over a year ago. These losses, aggregating many millions of dollars, have naturally induced these companies to devise methods of cheapening the production, sale and distribution of their products. By owning plants that are widely scattered, where production can take place in accordance with the needs of the community lying closest to the plants; by manufacturing products at plants advantageously located to ore supplies; by reducing overhead expenses; and by eliminating unnecessary sales agencies, substantial economies can be effected. The combination being formed for this sole purpose, I am unable to see wherein it is tainted with illegality.

It is significant that the Attorney-General stresses what has appealed to steel manufacturers in the trying readjustments following the collapse of 1920 as the way out of their serious situation. There must be a cheapening of production and distribution. In a day of high transportation cost there must be ownership of plants in various districts, so that long hauls may be eliminated. Overhead must be cut down and output increased to produce the largest possible divisor into a lessened aggregate of fixed charges.

Seeing that the opinion just given was in response to a call of the Senate, it does not follow that the Department of Justice has established a policy of advising corporations definitely what they may or may not do without fear of prosecution. But a door has been opened that is not likely again to be completely shut. The Midvale-Worth-Cambria merger of war time went without

protest from Washington; likewise the acquisition of the Pennsylvania and Maryland companies by Bethlehem. Later came the Wheeling, La Belle and Whitaker-Glessner merger and the acquisition of the Ashland Iron & Mining Co. by the American Rolling Mill Co. But none of these or of the several minor consolidations of recent months met the challenge of a La Follette resolution.

The steel trade is not likely to conclude that the Attorney-General's findings as just announced give warrant for the indiscriminate forming of combinations, and it will not need to be reminded that the policy of to-day cannot determine with certainty that of to-morrow. Even the Supreme Court has made rulings that were tantamount to a reversal of itself. But there will be the satisfaction in connection with the opinion the Department of Justice has just given, that the "rule of reason" laid down in the Standard Oil case in 1911 is being practically applied and that furtherance of trade rather than restraint of trade may result from consolidation under the conditions now existing in the steel industry.

Better Sands for the Foundry

Not the least of the more recent developments in the foundry industry are those in molding sand research. For the first time in the history of the American Foundrymen's Association a special session was devoted to this subject at the annual convention in June. Too little attention has been paid to scientific study in this field; yet a vast deal depends on the composition and physical properties of molding sand, particularly in steel foundry practice. Temperatures are high there, and the chances of chemical reactions in the sand or between the sand and metal are many. It has been too long the custom to judge a sand by its appearance, by its action when handled, or by other untrustworthy tests. Scant investigation has been made of the chemistry required to meet temperature and other conditions.

The research now under way has had good results. More is being done in combining sands of various compositions to attain proper mixtures for diverse foundry conditions. It has been brought out that sands have been discovered which will not fuse at 3200 deg. Fahr. Mixtures which rightly may be called synthetic sands are also a possible development, and their use should mean better castings. As in the refractory industry, so with sand, the value of a knowledge of chemistry is being more thoroughly recognized.

Despite the slow recovery in the output of steel in Great Britain, exports are large and expanding. The May shipments of steel and iron from the country, 300,981 gross tons, were second only to those of March, and bring the monthly average for 1922 to 275,300 tons, or almost on a par with the 1920 rate. Over 50 per cent of the exports to June, this year, are made up of pig iron, rails, tin plate and galvanized sheets, with the latter predominating. An examination of the steel output, however, presents a singular contrast. For the first half of this year the monthly average was only 427,100 tons, with the June output next to the lowest for the year. In 1920 British steel furnaces made 755,600 tons per month. The rate this year is, therefore, only 56.5 per cent of the 1920 rate, while the exports to June 1 have been almost the same as in that year. The conclusion is natural that domestic demand is abnormally low.

The Relation of Scrap Prices

The theory held in many quarters that the coal strike would be particularly influential in advancing the market value of iron and steel scrap has not been borne out by events. It was natural enough to entertain such a theory. For many months it appeared that scrap was selling at less than what might be called its "intrinsic" value, i.e., that the offerings were so large that buyers did not have to pay as much for it as they could afford to pay, considering its value to them in relation to pig iron. When coke becomes scarce, scrap is particularly useful. Certain forms, which are quite cheap relative to heavy melting steel, can be charged into the blast furnace with the effect of reducing the consumption of coke per ton of pig iron produced. Certain forms of scrap can be used advantageously in the open-hearth furnace to reduce the amount of pig iron needed to make a ton of steel, the saving in coke being in proportion to the amount of pig iron saved. The iron mill makes rolled material from scrap, taking the place of steel in the manufacture of which coke plays a part. Similarly the iron foundry can use scrap and get along with less pig iron from the blast furnace.

Scrap, however, has not had any remarkable price advance since last March, while recent reports indicate an easier position in the market. At no time have buyers of scrap found any difficulty in getting all they wanted, merely by paying slight advances in price. Some of the advances that have occurred in the scrap market, moreover, were produced more by the ingenuity of the sellers than by consumers bidding against each other.

The average quoted price of the ten descriptions of scrap given in the comparison table of THE IRON AGE was $14.95 for March 28 last, and $16.875 for July 18, showing an advance of $1.925 per ton or about 13 per cent. In the same interval the composite of pig iron advanced $5.23, or about 28 per cent, while the composite of finished steel advanced $3 a net ton or 7½ per cent.

Thus scrap advanced barely more than one-third as much as pig iron in dollars per ton and less than one-half as much in percentage. It advanced more than did finished steel, but every one expects an average of finished steel products to be a slow-moving affair.

This showing agrees with the broader view that may be taken of the history and position of scrap. We seem to have passed into a new era. There was a time when scrap was regarded as one of the sensitive items in the general iron and steel market. Often an advance or decline in scrap prices foreshadowed what was likely to occur in pig iron or steel prices generally. When

scrap became scarce it was very scarce and when it became plentiful it was very plentiful.

Nowadays there is a much larger quantity of scrap moving, and the quantity is probably considerably larger than 15 or 20 years ago relative to the total tonnage of pig iron or steel produced. With larger tonnages, better facilities are provided for storing scrap and moving it as occasion requires. A scrap yard is an institution rather than a place where some junk chances to be piled. No small factor in this development is the magnet, which has facilitated greatly the handling of scrap.

A general principle is involved, that when the production of pig iron was increasing in geometric ratio, with a doubling every ten years, the old material coming out was naturally a smaller percentage of the new material being made than is the case when production is increasing at a more moderate rate. At the moment there is also the factor that a lot of material was left over from the war.

Employers the Buffer

When organized workmen demand of their employers higher wages and easier working conditions, under the guise of requiring a "living wage," the employers are only the buffer between their employees and the general public. The "living wage," which B. M. Jewell, president of the railroad shopmen's organization, sets at $2,637 a year, is not in essence the number of dollars mentioned, but the things the number of dollars would buy at present prices. The men would not be content to be paid in depreciated dollars and have prices of everything go up correspondingly.

It is well established by various statistical investigations, the substantial accuracy of which cannot be questioned, that the sum total of production in the country is far from sufficient to furnish each worker a share equal to that demanded by those who have expressed the "living wage" in concrete form. When workmen demand a disproportionate share the demand can be granted only by the general public suffering to the extent of the extra amount involved. The employer feels the full shock, but it is so distributed that the individual member of the community suffers but a little part of each particular shock. In the aggregate, however, the pressure upon the public is the sum total of all the shocks.

Employers have been so unwilling to emphasize the fact that they must perforce pass the extra payments along, that the public has been encouraged to remain in the unthinking stage. The public needs to be educated to the fact that it, not the employer, pays in the long run. There is need of one publicity campaign after another to carry enlightenment to all workers.

As a matter of fact, the machinery for passing the expense of unreasonable wages or working conditions on to the public is in the most important cases in full view. More than one-third of all organized labor is taken care of under the Transportation Act, which requires the Interstate Commerce Commission to fix passenger and freight charges upon the public covering the expenses of the railroads, whatever they may be. This is a plain legislative enactment. In the coal industry, where organized labor is largely represented, few if any are disposed to question that the long strikes or mining suspensions occasioned by the United Mine Workers are paid for by the public. In the building trades, where there is the third great group of organized workmen, the contractors make no secret of the fact that when they bid on a job they take cognizance of the wages they will probably have to pay and the number of days the workmen will be on the job. No contractor pretends that he pays any increase in wages out of his own pocket.

Surprise often is expressed that organized labor has the temerity to make the demands it does. It should not be particularly surprising. The surprise rather should be that employers make so little effort to advertise the fact that in these matters they are merely the buffers between their employees and the general public, and an equal surprise that the general public is not more roused by being forced to pay excessively for transportation service, for coal, for houses and for other things because organized labor demands more than its proper share of the total production of the country.

Evidence of the increased activity of manufacturing is given in the customs returns for May. The value of crude materials imported for use in manufacturing was 34 per cent greater in that month than for May, 1921, without taking into account the higher prices ruling a year ago, and the imports of "manufactures for further use in manufacturing" were valued at 64 per cent more than those of May a year ago.

Iron and Steel Production in Canada

The production of pig iron in June in Canada showed an increase of 23 per cent over the output of the previous month according to the statement issued by the Dominion Bureau of Statistics, Ottawa. A tonnage of 28,367 was reported for the month as compared with an output of 23,363 gross tons in May. The basic pig iron produced for the further use of the companies reporting increased by 8449 tons over the previous month's record. The malleable iron produced for sale also presented a substantial increase. On the other hand the production of ferroalloys in blast furnaces decreased from 2680 tons in May to 2051 tons in June, involving a reduction of 23 per cent.

The pig iron and ferroalloys produced during the first six months of the year presents a decline of 118,129 gross tons or 31.9 per cent from the output for the corresponding period of 1921. At the end of June last year six furnaces were in blast as compared with four furnaces in operation on June 30. One furnace was blown in in June by the Dominion Steel Corporation at Sydney, N. S., and two were blowing at the plant of the Algoma Steel Corporation, Sault Ste. Marie, Ont., and one at Hamilton, operated by the Steel Co. of Canada.

It may be of interest to quote the price of basic pig iron in this connection as given by one of the Canadian producers. The price was $24 per ton in April; $26 in May and $27 in June. The Labor Department index of iron and steel wholesale prices, including eleven commodities reached the lowest point in April since 1916. The index for the month was 182.5 as compared with an advance to 184.2 in May.

With the exception of the output during February,

the steel production in June was the greatest for any single month this year. The output of castings was practically maintained while the production of ingots increased from 15,646 tons in May to 31,270 tons in June involving an increase of 99.8 per cent. As usual a large proportion of the output consisted of open hearth basic steel intended for further use. On the other hand 1318 tons of castings comprising three different grades of castings were produced for sale.

A comparison of the cumulative steel production during the first six months of the present year with the record for the corresponding period of 1921, throws recent performance into an unfavorable light. The half year of 1921 was credited with an output of 295,140 tons, or 66.7 per cent more than the production of the first six months of the present year.

German Steel Prices and Costs Are Steadily Rising

Shortage of Supplies at Home Causes Export Market to Be Neglected—The "Catastrophe Boom" Goes On—Coal Situation Tightening

(*Special Correspondence*)

BERLIN, GERMANY, July 12.—The currency crisis which followed Dr. Rathenau's assassination has accentuated the existing tendencies in the German iron, steel and machinery trades. Prices are flying upwards, production cost is rising accordingly, the home market is buying so greedily that a general shortage of supply prevails and the export market is neglected and nearly all producers have orders for months ahead. Judging by experience, these familiar features of the so-called "catastrophe boom" will continue unless the reichsmark has not only a real recovery, but a recovery that is maintained for at least some months. Of this there is at present no sign.

Prices of the Steel Syndicate's products have undergone another all-round increase. The rise in coal prices came unexpectedly on July 1. Standard Ruhr coal (Foerdergruskohlen, price in 1914 13.75 marks) was then increased from 890.30 marks to 1184 marks per metric ton, and all coal, coke and briquettes correspondingly. Foundry coke was raised from 1355 to 1851 marks. This was the result of a mining wage increase of 65 marks per man per shift. The average coal price increase was 31 per cent. The resulting increase in Steel Syndicate prices was given in THE IRON AGE, July 20, page 184.

A marked divergence as to price policy has shown itself among the groups represented in the Steel Syndicate. The pure producer firms stand solidly for higher prices. But many of the most influential producers are also increasingly consumers, owing to the co-operation of their mills with machine construction and shipbuilding concerns. This applies to Stinnes, Krupps with their machine and locomotive shops, the Gutehoffnungshütte, which operates with the important Augsburg-Nürnberg Machinery Co., and the Stumm concern, which as early as 1919, the chief lower Rhine plant of August Thyssen, used its whole steel production for its own finishing manufactures. This tendency was one of the factors causing the dissolution of the old Stahlwerks Verband, of which the present Stahlbund is an offshoot. The diversity of interest has tended to keep down Steel Syndicate prices. While the legal maximum pig iron prices have been raised four times since May 1, the Stahlbund products have been raised only twice. However, the new fall in mark exchange (the dollar having closed last week at 536) has again thrown the German prices far below those of the world market, and for a time German complaints of English, French and Belgian underselling of Stahlbund products have ceased.

Scrap iron is very firm, having risen between May 18 and July 3 from 4400 to 5800 marks, and being about 12-fold the 460 marks which was the low point reached in May, 1921. In the belief that this rapid rise is due partly to speculation, the Reichsrath has sanctioned an ordinance restoring official rationing and control of scrap, which may henceforth be requisitioned at fair prices and distributed to consuming concerns.

Fuel Scarcity Accentuated

The coal and coke shortage continues to be acute. The official limitation of self-consumption by combined coal mining and smelting concerns imposed in June is still in force. The Government has decided to prolong the term for tax-free import of foreign coal from Sept. 1, 1921, to March 31, 1923. English coal is now being used in parts of Germany which it never reached before the war.

The Wirth Cabinet has resumed negotiations with the Allies, declaring that financially Germany cannot continue coal importations, and complaining that the Reparations Commission takes one-third of the whole supply of coking-coal, while it takes practically no brown coal.

The coal loss caused by the cession of Upper Silesia is put officially at 20 per cent. The Ruhr coal miners still refuse to agree to work extra shifts for much higher wages, and output is checked by a syndicalist agitation and by the flight of mining labor into the now reviving building trade. In May the Ruhr production per working day was only 310,844 tons against

The Iron Age and Its Readers

Frequently a letter has come to the editorial offices of THE IRON AGE relative to an article which the inquiring reader overlooked in the week of its publication. Having had his attention called to the article and its direct bearing on his business, the writer appealed to the editors to help him in locating it. This may be the experience of some IRON AGE readers in respect to the article on page 1754 of the issue of June 22, dealing with market prices in German metal-working industries, also the wages and hours of workers in those lines. The article brought out clearly the competitive possibilities of German products as determined by the exchange situation and the efficiency of German workers. A reader of THE IRON AGE writes: "It impresses me as the most illuminating review of this highly important subject that it has been my privilege to read."

Surprisingly interesting data are often found in documents which the average manufacturer and user of iron and steel rarely sees. THE IRON AGE of July 6, for example, gave two pages of little-known facts concerning iron and steel products which enter into the everyday life of the people, among them pins, pens, wood screws, snap fasteners and clasps, metal buttons, wire staples and steel wool and shavings. Coming to heavier things, this article, which was based on research of the United States Tariff Commission, gives interesting facts about woven wire cloth, chains, bolts and nuts, and wire for fencing and for baling hay. Many letters come in THE IRON AGE mail asking questions to which the article in the July 6 issue gives the answer.

326,637 tons in April and 333,862 tons in March.

Germany has practically ceased to export coal, with exception of compulsory reparations deliveries, and practically compulsory deliveries to Austria, Poland, Hungary, Danzig and Memel. The entirely free export to Holland, Switzerland and Czecho-Slovakia totaled in 1921 only 2½ million tons. With the mark exchange again depreciated, the price of English coal is far above German. The Essen "Bergwerks-Zeitung" predicts that further smelting furnaces will be blown out.

Pig iron is still being imported. Just before the last mark drop, the Pig Iron Syndicate sold imported Luxemburg foundry pig (No. 3) at 6800 marks.

The demand for rolling mill products is enormous. The State Railroad central office complains that it cannot get a sufficient supply of rails. For field, light and mine rails there is also an extraordinarily active demand. The export market in heavy rails is, however, sharply fought for. Germany's competitors of late have been offering very cheaply, and German firms declare that they cannot stand the 5 per cent export duty and the 2 per cent sales duty. This was before the new mark fall which has restored Germany's advantage.

Machine and electro-technical shops report having an abundance of old orders. Late last month they reported that few new orders were coming in, but since the mark collapse there have been symptoms of a new ordering boom.

German Exports to Holland Cut Down

Foreign trade reports show that the continuous home boom and the short supply (the two things are really one) have badly hit exports. Competitors have cut into Germany's chief market, Holland. In March Holland imported 4,123,000 kg. of pig iron, of which 1,867,000 kg. came from Germany, 1,140,000 kg. from Belgium, and 586,000 kg. from England. In April, of 2,057,000 kg. imports only 543,000 kg. came from Germany, while 1,030,000 kg. came form Belgium. Of Holland's imports of 696,000 kg. of semi-finished products in March Germany supplied 440,000 kg., whereas in April she supplied only 153,000 kg. out of 349,000 kg. In cast and forged machine parts, etc., deliveries from Germany fell from 544,000 kg. to 366,000 kg., while the German delivery of iron plates of all kinds fell from 8,011,000 kg. to 4,913,000 kg., both English and Belgian sales having increased. Germany's exports of iron and iron wares of all sorts other than machines, but including machine parts, in January-April inclusive, were 811,680 metric tons, valued at 11,249,040,000 marks. The figures for these months of 1921 are still lacking. The export of machines was 146,889 tons, valued at 5,022,284,000 marks.

A new patent fee schedule came into force on July 1. The patent registration fee is 300 marks; the annual fee, for the first and second years is 300 marks, for the third, 400 marks; fourth, 500 marks, and so on progressively up to 20,000 marks for the fifteenth and last year. The Reichstag rejected the Government's proposal to lengthen the patent term to 18 years.

Under presidency of Herr Adolf Ebering of Westhofen, a number of firms in the small iron manufacturing branches have formed the Eisenzentrale G.m.b.H., which is to do all the iron and steel buying for its members. The Deutsche Bank, reports *Deutsche Export*, is behind a new Hungarian company, capitalized at 120,000,000 Hungarian crowns, formed for exploitation of the newly-discovered manganese ores in the Hungarian Comitat of Vessprim. Stinnes' Rhine-Elbe Union is about to lay down a new great iron works in the neighborhood of Dortmund.

ERRATIC MARKET

Much Anxiety in the Valley Districts—Sheet Maker Withdraws

YOUNGSTOWN, July 25.—Sales officials characterize the market as "erratic," as current unsettlements are creating considerable anxiety on the part of manufacturing consumers over steel supplies.

An independent whose blast furnace has been forced into suspension is protected on its pig iron requirements for 60 days, much of this iron having been purchased at $18, before prices advanced. This interest has withdrawn from the sheet market for the time being.

In general, makers are showing little interest in new offerings, being satisfied to meet obligations of regular customers, if possible. In full finished sheets, merchant bars and pipe, district interests are falling behind in their obligations.

Little or no surplus iron is available from Valley interests, whose own supplies are becoming inadequate. The shopmen's strike has prevented resumption by a number of merchant furnace operators, which had prepared to blow in their stacks during July.

In the sheet market, a number of independents are endeavoring to meet requirements of their customers at the prices quoted by the leading interest. One maker, however, reports that it is getting some tonnages of black at 3.30c. and galvanized at 4.30c., or $3 per ton above quotations of other producers. This same company likewise claims to be entering blue annealed tonnages at 2.60c., or $4 per ton higher than the 2.40c. price of the leading maker.

All Valley sheet mills have a comfortable backlog on their books, and the problem of delivery is now paramount to that of sales.

There has been accelerated demand for plates from tank builders and car repair interests. The principal Valley maker is well filled on 84-in. mill plate sizes. Plate quotations vary, say consumers, from 1.70c. to 2.25c., though little tonnage is available for early delivery at the lower figures.

The market on merchant bars ranges from 1.75c. to 1.80c., with principal district independent declining new offerings.

All orders are being subjected to close scrutiny, in finished lines.

Important district shippers fear that a car shortage will follow in wake of settlement of the coal and railroad strikes, especially affecting open top equipment. Difficulties in car supply are anticipated through balance of the summer.

Melters are using larger tonnages of scrap since restrictions in iron output, with heavy melting grades moving to consumers at $18.50.

Among the papers announced to be submitted to the technical sessions which will be held at the time of the eighth national exhibition of chemical industries at Grand Central Palace, New York, in the week of Sept. 11, are mentioned the following: "Steel Belts and Their Application to the Solution of Conveying Problems," by Harry Carlson, of Sandvik Steel, Inc., New York. "Moderation in Standardization," by W. D. Collins, United States Geological Survey, and "Standardized Testing Apparatus," by N. F. Harriman, United States Bureau of Standards.

New editions of its books on wheels, car blanks and circular forgings have been issued by the Carnegie Steel Co., Pittsburgh. One of these is devoted to wrought steel wheels for steam and electric railroad service. Besides the specifications of the American Society for Testing Materials, the book contains profiles with detailed dimensions of the wheels it manufactures. A saparate booklet includes the profiles and tables of dimensions for various types of industrial car wheels, including crane wheels, and besides gear blanks, shows the form and range of sizes of piston blanks and pipe flange blanks regularly made.

JAPANESE BUYING LIGHT

Price Ideas Below Prevailing Market—Shanghai Market 15 Per Cent Below American Prices—Imports

NEW YORK, July 25.—A small but active trade continues with South American countries in merchant products, orders being usually of 50 to 75 tons. The Chinese market is dull as far as American exporters are concerned, as a result of the uncertainties of the political situation there. Because of inability of merchants to obtain advances from banks, warehouses in Manchuria are stated to be carrying less than 25 per cent of usual stocks. A recent cable received by a large export house dealing exclusively with China, reports that prices in the Shanghai market are about 15 per cent below the quotations now being received by importers from the United States. The needs in China are large and with any considerable improvement in the situation, exporters to this market expect a satisfactory run of buying.

Japan continues to buy rails, black sheets of light gage and some structural material. A recent order from the Keizo Electric Railway, Keizo, Corea, involving a small tonnage of 60-lb. and 92-lb. grooved rails, was divided between Suzuki & Co., and Mitsui & Co. A tonnage of steel scrap, for use in a large steelworks, has been contracted for with Asano Bussan & Co., 165 Broadway. The total contract is for about 10,000 tons and is being shipped c.i.f. Moji, in lots of 1000 and 2000 tons. Some small purchasing of structural material is noted and there is an inquiry in the market from a private interest involving about 200 tons of structural steel. A tender on tin plate for canning purposes, the annual requirement of the Japanese army, is in the market from the Imperial Government. When first issued it called for slightly more than 7000 base boxes, but was later reduced to about 4300 base boxes.

Japanese buyers are exhibiting a distinct tendency to bear the market. Whether this is because of a belief that lower prices are unobtainable from the United States than are being quoted, or because of lower offers from British sellers, is a question. Inquirers for tin plate have made counter offers to exporters of about 50c. per base box lower than the c.i.f. quotation made and on structural material the offers have been as much as $5 per ton under the possible c.i.f. price at the present market. On light rails Japanese buyers seem to think they should be able to purchase from the United States at as low as $50 per ton, c.i.f. Japanese port.

Japanese exporters in Japan will be partly financed by the Imperial Government, if a proposal to be presented to the Diet, proves successful. The plan is designed to aid Japanese exporters to compete in foreign markets by the extension of long-term credits, the Government furnishing one-half the necessary financial assistance. It is proposed to seek yen 100,000,000 from the Diet, if the plan is acceptable to the Government.

As the American domestic market ascends, importers become more and more convinced that they should be able to import foreign material. At the same time, the shortage of pig iron is influencing more consumers to interest themselves in foreign iron. While these efforts at importation are largely confined to pig iron, one export and import house in New York is offering shovel steel, about 0.40 to 0.60 per cent carbon, of English origin, at $2 to $3 per ton, f.o.b. New York, under the prevailing price.

According to the American consul at San Salvador, a contract involving about 4000 meters of 3½-in. iron pipe, 500 meters of 2-in. and 100 meters of 1-in. pipe, has been closed between the Water Supply Committee, Department of La Paz, San Salvador and J. Gerardo Flores, San Salvador. The pipe is to be installed for water supply to San Juan Talpa. A contract involving cast-iron pipe will be opened Aug. 16 by the Argentine Sanitary Works and calls for 8201 tons of pipe as well as a tonnage of valves and accessories. The material is for installation at Resistencia, Posadas, La Banda, Rawson and Jachal, Argentina. Bids are being received by the Secretaria del Directorio de las Obras Sanitarias de la Nacion, Charcas 1840, Buenos Aires, Argentina.

China's total production of pig iron annually, according to the estimates of K. Y. Kwong, engineering and mining authority, is about 450,000 tons from Chinese owned and operated furnaces and 250,000 tons from Japanese owned furnaces, says Commercial Attache Julean Arnold at Pekin. The iron ore output is estimated at 2,000,000 tons.

FRENCH MARKET QUIET

About 50 Per Cent of Furnaces in Blast—Rise of Pound Sterling Aids Exports—Shortage of Skilled Labor.

(By Special Correspondence)

PARIS, FRANCE, July 13.—The domestic demand for iron and steel is very quiet, but there is more activity for export. The number of blast furnaces now in operation in the east of France is about 74: Lorraine (June 27), 37, out of a total of 66; Meurthe-et-Moselle (production in May, 178,000 tons), 37, out of a total of 85.

Reports recently published by large Lorraine works, such as Knutange, Rombas, etc., have shown material losses. These concerns hope, of course, to increase output, which will reduce costs; but, besides world economic conditions which restrict this expansion, there are other factors, such as a shortage of skilled labor. For instance, the Société de Redange-Dilling has blown out the only blast furnace it had in operation at its Redange works. The Société Lorraine Minière et Métallurgique, Thionville, has not yet re-started one blast furnace lately blown out because of lack of labor. It is a lack of labor also which prevents the Société Métallurgique de Knutange from blowing in the sixth blast furnace, out of its total of 10.

Iron Ore.—There is no change in the iron ore market. Transportation rates on French iron ore have been reduced as follows: Exported iron ore receives a 15 per cent reduction on old rates, reduced themselves by 10 per cent for full trainloads made up of cars owned by the railroad companies and by 15 per cent when the cars are privately owned. Iron ore forwarded from a mine situated outside the eastern and northern areas to ironworks situated also outside those areas receives a 25 per cent reduction on old rates or 30 per cent if minimum consignment is 180 tons. These reductions will remain in force until Oct. 31.

Pig Iron.—Chill-cast foundry pig iron, No. 3 P. L., has declined to 205 to 210 fr. With the Belgian franc at 0.95 fr. French, Belgian pig iron is at about the same level. Very low prices f.o.b. Antwerp are being quoted for export by Lorraine works. The considerable rise of the British pound has greatly benefited French producers, who can now sell hematite pig iron easily, within the zone of penetration of British hematite, at 295 to 305 fr. Prices for the other areas are: Eastern area, 305 to 315 fr.; Center and Parisian areas, 325 to 330 fr.

Semi-Finished Steel.—Inland demand for semi-finished products is restricted, but a rather large export business is being done, in competition with Belgian and Luxemburg producers.

Finished Steel.—There is nothing new to report in plates and sheets, except that the rise of the British pound is greatly helping French producers. The base prices of the Comptoir des Tôles, delivered at average destinations, remain as follows: Flat bars, 590 fr. per metric ton; heavy sheets, 640 fr. per metric ton; medium sheets, 720 fr. per metric ton; light sheets, 900 fr. per metric ton. The prices of rolled merchant products, affected by the lack of orders, are lower, and purchasers easily obtain quotations as low as 400 fr. on large orders of heavy shapes. But on small orders of various specifications the price remains 420 to 430 fr. Steel wire is 450 to 470 fr.

Iron and Steel Markets

GREAT UNCERTAINTY

Emergency Order Brings a Crisis

Industry May Be Dependent for a Time on Fuel Stocks—A Week of Increasing Suspensions

The sweeping order of the Interstate Commerce Commission, effective Tuesday midnight, establishing priorities in all railroad traffic and in fuel distribution have thrown the steel trade into a condition of utmost uncertainty.

Under the war priorities of four years ago, steel as one of the chief war necessities was high on the priority list, but the order just issued requires that the iron and steel and allied industries wait for coal until the more essential consuming lines have been supplied.

An immediate effect, assuming that coal begins to move at once to the preferred classes, would probably be to take up most of the soft coal output, estimated at 4,000,000 tons this week, leaving steel and other industries to depend to a large extent upon their stocks. These represent in most cases not more than a 30 days' supply.

While recently the insufficiency of transportation and the lack of coal have affected steel production more than consumption, it is now to be expected that actual requirements of steel consumers will decrease along with the cutting off of shipments from mills. An unknown factor, in the absence of actual experience under the rationing scheme, is the extent to which the coal output of steel company mines will be taken for distribution among preferred consumers.

It is not to be overlooked that shipments of food and other preferred commodities as named on the Commerce Commission's list are fully provided for in the present movement of freight and that therefore the effect of the priorities in fuel distribution are the chief of the new factors introduced into the situation.

Before the announcement of the new order, which comes as this review is written, the slowing down in blast furnace and steel works operations was more noticeable than in the third week of July. Eastern Pennsylvania, Johnstown and the Mahoning and Shenango valleys had the most marked curtailment. The Pittsburgh district was nearly up to its operation of the preceding week.

In the week ending July 22, four additional blast furnaces were banked in the East, including one Bethlehem and one Sparrows Point, one at Sharpsville, Pa., and one at Leetonia, Ohio.

At best the outlook is for such a railroad congestion as will affect the entire industry for weeks to come.

Coke prices have advanced rapidly and Connellsville foundry coke has been sold at from $14.50 to $15, an advance of $4.50 to $5 within a week. Quotations on furnace coke are almost, if not fully, as high. Coal which sold at $1.90 on April 1 and at $3.50 under the agreement with Secretary Hoover, is now selling at from $8 to $9 and the Hoover schedule has been abandoned, although coal companies are making deliveries at low prices on contracts. Considerable imports of British coal have been arranged for and there are some negotiations for British coke.

Due to the increasing scarcity of coke, there is a decided upward tendency in pig iron prices, with much irregularity. Advances range from 50c. on Alabama iron to as much as $3 in some Northern centers on foundry and malleable grades. Sales have been limited and there is only fair inquiry. The largest sales of the week was 5000 tons of basic to a Cleveland steel company. Foreign pig iron has already advanced under increased demand and higher freight rates which have been brought about by contracting for the shipment of coal from England to the United States.

It is now definitely announced that reduced freight rates on pig iron from Birmingham to St. Louis, Cincinnati and Louisville will become effective Sept. 1, but there will be no reduction to Cleveland, Chicago, or other Northern points because Northern railroads would not agree to reductions proposed by Southern lines.

Scotch foundry iron has been sold for prompt shipment to Atlantic ports of the United States, and our London cable reports pending inquiries.

Railroad equipment business is still noteworthy. Not only have several more large car repair inquiries been put before the trade, involving upward of 8500 cars, but 5000 steel cars have been bought, taking probably 50,000 tons of steel, and the locomotive orders of the week aggregate more than 100.

Iron ore stocks at blast furnaces and on Lake line docks on July 1 were 25,367,000 tons, as against 30,066,000 tons one year previous. Furnace consumption of ore was 3,388,000 tons in June, compared with 3,294,000 tons in May, an indication that until the railroad strike operations were being well maintained.

Pittsburgh

Curtailment of Operations More General — Outlook Uncertain

PITTSBURGH, July 25.—The slowing down in blast furnace and steel mill operations is beginning to reach impressive proportions. Thus far the most serious curtailment has been in eastern Pennsylvania at Johnstown, and in the Mahoning and Shenango Valleys. The immediate Pittsburgh district is still running fairly well, but it also will suffer severely within a few weeks unless there is a great improvement in fuel supplies. Nearly all the by-product plants are receiving much less coal than formerly. Some have had to curtail operations already, while others are running on stocks, which will not last long, a 30-day stock being probably the greatest at any by-product plant. The chief cause of present trouble is the inability of railroads to move Kentucky and West Virginia coal, this having been lately the principal dependence of Ohio, western Pennsylvania and Buffalo by-product coke plants and the chief cause of railroad incapacity is the shopmen's strike, although some congestion had developed by the middle of June.

Thus far the insufficiency of transportation and the lack of coal has affected steel production more than steel consumption, but it is the common view in Pittsburgh

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	July 25, 1922	July 18, 1922	June 27, 1922	July 26, 1921
No. 2x, Philadelphia‡	**$28.77**	$27.64	$27.82	$21.35
No. 2, Valley furnace†	**25.00**	24.00	24.00	19.50
No. 2, Southern, Cin'ti†	**22.55**	22.05	23.00	24.50
No. 2, Birmingham, Ala.†	**18.50**	18.00	18.00	20.00
No. 2 foundry, Chicago*	**25.00**	24.00	23.50	18.50
Basic, del'd, eastern Pa.	25.75	25.75	25.00	21.25
Basic, Valley furnace	24.00	24.00	25.00	19.00
Valley Bess., del. Pitts	26.77	26.77	26.96	22.46
Malleable, Chicago*	**25.00**	24.00	23.50	18.50
Malleable, Valley	**27.00**	24.50	24.50	20.50
Gray forge, Pittsburgh	**26.27**	25.27	25.46	21.46
L. S. charcoal, Chicago	31.65	31.65	32.00	36.00
Ferromanganese, seaboard	67.50	67.50	67.50	70.00

Rails, Billets, Etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$40.00	$40.00	$40.00	$47.00
Bess. billets, Pittsburgh	35.00	35.00	35.00	30.00
O.-h. billets, Pittsburgh	35.00	35.00	35.00	30.00
O.-h. sheet bars, P'gh.	35.00	35.00	35.00	32.00
Forging billets, base, P'gh	40.00	40.00	40.00	35.00
O.-h. billets, Phila.	40.17	40.17	40.74	35.74
Wire rods, Pittsburgh	40.00	40.00	40.00	42.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	1.70	1.70	1.70	1.90
Light rails at mill	1.75	1.75	1.60	1.85

Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	1.925	1.925	1.96	2.10
Iron bars, Chicago	**2.00**	1.90	1.75	1.85
Steel bars, Pittsburgh	1.70	1.70	1.70	1.75
Steel bars, Chicago	1.75	1.75	1.75	2.13
Steel bars, New York	2.04	2.04	2.08	2.13
Tank plates, Pittsburgh	1.70	1.70	1.70	1.80
Tank plates, Chicago	1.75	1.75	1.75	2.18
Tank plates, New York	2.04	2.04	2.08	2.18
Beams, Pittsburgh	1.70	1.70	1.70	1.85
Beams, Chicago	1.75	1.75	1.75	2.23
Beams, New York	2.04	2.04	2.08	2.23
Steel hoops, Pittsburgh	2.50	2.50	2.40	2.50

Sheets, Nails and Wire,	July 25, 1922	July 18, 1922	June 27, 1922	July 26, 1921
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	3.15	3.15	3.15	3.00
Sheets, galv., No. 28, P'gh	4.15	4.15	4.15	4.00
Sheets, blue an'l'd, 9 & 10	2.40	2.40	2.40	2.40
Wire nails, Pittsburgh	2.40	2.40	2.40	2.75
Plain wire, Pittsburgh	2.25	2.25	2.25	2.50
Barbed wire, galv., P'gh.	3.05	3.05	3.05	3.40
Tin plate, 100-lb. box, P'gh	$4.75	$4.75	$4.75	$5.50

Old Material, Per Gross Ton:				
Carwheels, Chicago	$19.50	$19.50	$18.25	$12.50
Carwheels, Philadelphia	17.50	17.50	17.50	16.00
Heavy steel scrap, P'gh.	17.25	17.25	17.00	12.00
Heavy steel scrap, Phila.	15.00	15.00	15.00	11.00
Heavy steel scrap, Ch'go	15.50	15.50	14.75	10.00
No. 1 cast, Pittsburgh	19.00	19.00	19.00	16.00
No. 1 cast, Philadelphia	17.50	17.50	19.00	17.00
No. 1 cast, Ch'go (net ton)	17.00	17.00	16.50	11.50
No. 1 RR. wrot., Phila.	**17.50**	17.00	17.00	13.50
No. 1 RR. wrot., Ch'go (net)	13.50	13.50	13.25	9.00

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	**$14.00**	$11.00	$7.50	$2.75
Foundry coke, prompt	**14.00**	11.00	8.00	4.00

Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake Copper, New York	14.00	14.00	13.75	12.50
Electrolytic copper, refin'y	13.75	13.75	13.50	12.25
Zinc, St. Louis	*5.95*	5.75	5.27½	4.25
Zinc, New York	**6.30**	6.10	5.62½	4.75
Lead, St. Louis	*5.40*	5.50	5.55	4.35
Lead, New York	5.75	5.75	5.80	4.40
Tin (Straits), New York	**32.12½**	31.50	31.00	26.00
Antimony (Asiatic), N. Y.	**5.25**	5.00	5.00	4.65

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price, July 25, 1922, Finished Steel, 2.169c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel

July 18, 1922,	2.169c.
June 27, 1922,	2.169c.
July 26, 1921,	2.364c.
10-year pre-war average,	1.689c.

Composite Price, July 25, 1922, Pig Iron, $24.05 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

July 18, 1922,	$23.61
June 27, 1922,	24.05
July 26, 1921,	19.48
10-year pre-war average,	15.72

steel circles that the actual requirements of steel consumers will decrease almost as much as the supplies of steel. Thus far, however, buyers of steel have not exhibited any expectation that their consuming ability will be much decreased and they are clamoring for deliveries for steel while mills are endeavoring to regulate their deliveries to the respective requirements of customers.

There is somewhat more urgent inquiry in connection with the purchase of products for prompt mill deliveries, but the tonnages called for are relatively small. Premiums for early delivery are tending to increase. They apply almost entirely to assured early deliveries, rather than to moderately early deliveries. Buying from warehouse, in place of ordering for direct mill shipment, has increased, orders not infrequently being for whole carloads, particularly in butt weld pipe. Pittsburgh warehouses are endeavoring to avoid taking orders that should go direct to mill, and preserve their warehouse facilities to meet regular small lot requirements. Pittsburgh warehouse prices were advanced $3 a ton last week, to 2.35c. for bars and 2.45c. for plates and shapes.

In iron and steel circles, regret is universally expressed that the industrial outlook, recently so promising, should be clouded by the railroad and coal strikes. The augury for autumn business is much less favorable than 30 or 60 days ago.

The mill price of 1.60c. on bars, shapes and plates, occasionally quoted in the past few weeks on particularly desirable orders for indefinite delivery, seems now to have disappeared entirely, leaving the market squarely on a 1.70c. minimum.

Pig Iron.—Only one or two merchant furnaces in western Pennsylvania and the Valleys are in operation, nearly all of the few that were in operation 30 days ago having had to bank or blow out on account of inability to obtain coke. The furnaces have some stocks. Consumers are very apathetic and it might be difficult to sell any considerable tonnage of pig iron regardless of the price, while on the other hand forced purchases would probably develop very high prices. A sale of 200 tons of standard Bessemer iron of immediate shipment was made last Friday at $25, Valley, the price formerly quoted. On the same day, a sale of 100 tons of malleable was made at $27, Valley, which illustrates the vagaries of the market. A sale of basic iron is believed to have been made within a week on the basis of

about $24, Valley, following recent sales at that price or a shade lower. On the other hand, it is not definitely known where any more could be had at any price. Foundry iron sold a few days ago at $25, Valley, or $1 advance over last week's quotations. A higher price might be obtained now, but there is no inquiry of importance and there are no regular asking prices.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.77 per gross ton:

Basic	$24.00
Bessemer	25.00
Gray forge	$24.50 to 25.00
No. 2 foundry	25.00
No. 3 foundry	24.50 to 25.00
Malleable	27.00

Ferroalloys.—There is nothing new in the ferroalloy market, as mills exhibit no interest in purchases on account of prospects of greatly decreased operations.

We quote 78 to 82 per cent ferromanganese, $67.50 c.i.f. Atlantic seaboard for domestic; British, spot, $70; British, future, $67.50; German, 76 to 80 per cent, $66. Average 20 per cent spiegeleisen, $36 furnace; 16 to 19 per cent, $35 furnace; 50 per cent ferrosilicon, domestic, $55 to $60 furnace, freight allowed. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, $41.50; 11 per cent, $44.80; 12 per cent, $48.10; 13 per cent, $52.10; 14 per cent, $55.10; silvery iron, 6 per cent, $30; 7 per cent, $31; 8 per cent, $32.50; 9 per cent, $34.50; 10 per cent, $36.50; 11 per cent, $39; 12 per cent, $40.50. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $4.06 per gross ton.

Iron and Steel Bars.—Pressure for deliveries of steel bars continues heavy, but it does not appear that consumers are actually short of bars to any appreciable extent. The Carnegie Steel Co., which had lately been accepting some orders at 1.60c. for indefinite delivery, will not now sell at less than 1.70c. in any case and is very reserved about making further commitments.

We quote steel bars rolled from billets at 1.70c. to 1.80c.; reinforcing bars, rolled from billets, 1.70c. to 1.80c. base; reinforcing bars, rolled from old rails, 1.60c.; refined iron bars, 2.20c. in carloads, f.o.b. mill, Pittsburgh.

Structural Shapes.—The turnover in structural shapes is very light, and on account of previous commitments, mills are very reserved about selling.

Steel Rails.—The market is quiet in both standard and light rails. Coal mines are interested only in resuming production and do not feel in position to plan any improvements at this time.

We quote 25 to 45-lb. sections, rolled from new steel, 1.75c. base; rolled from old rails, 1.60c. to 1.65c. base; standard rails, $40 per gross ton mill for Bessemer and open-hearth sections.

Wire Products.—Demand for nails is unusually heavy for this time of year, but is being met by mills without much difficulty. Regular prices are unchanged. Detailed prices are given on page 245.

Cold-Finished Steel Bars and Shafting.—Producers expect to have difficulty in making deliveries against sales and contracts already made, as deliveries of hot-rolled bars have slowed down somewhat and are likely to slow down still more. While some sales have been lately at 2.10c., the common asking price has been 2.25c. and this would probably be insisted upon now, as producers do not care to take on any more tonnage with manufacturing conditions so uncertain. Ground shafting is firm at 2.50c. base, f.o.b. mill, and 2.60c. in less than carloads.

Rivets.—Following an advance of $3 per ton on rivets made on June 7 by leading makers there has been a further advance made of $5 per ton on all grades of rivets, effective from Monday, July 24. Local makers now quote 2.65c. base on button head structural rivets and 2.75c. base on cone head boiler rivets, 7/16-in. and smaller now being 70 to 70 and 5 per cent off.

Plates.—The plate mills that have been actively in the market of late are comfortably sold up, while a number of plate mills have been practically out of the situation, considering their costs too high to justify competing for business. While premiums are obtainable for early deliveries, this applies only to small lots, not enough to enable an idle mill to accumulate a back-log. The minimum on plates is now 1.70c., and this is only for indefinite delivery. Prices are given on page 245.

Tin Plate.—Some additional business has come to mills in the past week on account of crop prospects becoming still more favorable. Southern California will have the largest fruit and vegetable pack in history. On account of steel shortage, tin plate mills are unable to average more than about a 75 per cent operation and this is approximately the present rate. Prices are given on page 245.

Track Equipment.—Railroads are showing little interest in track equipment, as they are busy with labor matters. Demand for small spikes continues active. We continue to quote $2.25 on standard railroad spikes and $2.50 on small spikes and boat and barge spikes.

Billets and Sheet Bars.—The market is altogether inactive. Some sheet bars are offered for shipment from Newport, Ky., but there are few mills near enough to make the offer at all interesting. Producers generally are unwilling to sell while sheet and tin plate mills are uncertain, as to how much they will be able to consume. The market is more or less nominal, but is quotable at the old price of $35 for standard billets, small billets and sheet bars.

We quote 4 x 4-in. soft Bessemer and open-hearth billets at $35; 2 x 2-in. billets, $35; Bessemer and open-hearth sheet bars, $35; slabs, $35; forging billets, ordinary carbons, $40, all f.o.b. Youngstown or Pittsburgh mills.

Iron and Steel Pipe.—There is some intimation of a coming advance in the prices of both iron and steel pipe, but so far absolutely nothing reliable has been given out by the mills. Costs of making pipe in the past month or more are much higher than they were, and it is said that on certain sizes the mills could not break even at the present ruling. The demand for ½-in. butt and 1-in. lap welded black pipe is heaviest ever known in the history of the trade, these sizes being used largely in new building work. The leading interest is said to be filled up to October and independent mills for 60 days or longer. Discounts are given on page 245.

Hot-Rolled Strips.—The demand is more active now than for some time and prices are strong. None of the mills is getting out normal production owing to the coal and rail strikes, and the supply of cars is getting to be short in some districts. The automobile builders have been heavy buyers for some time and are still taking a good part of present production. On light gages of hot-rolled strips two or three mills are asking about $2 per ton advance over base prices and are able to get it in some cases. We quote hot-rolled strips at 2.50c. base, Pittsburgh.

Cold-Rolled Strips.—The market is fairly active and mills report they are sold up for six weeks or two months. Prices may advance on account of the higher manufacturing costs due to the coal and rail strikes. We quote cold-rolled strips at 4c. base at mill, Pittsburgh.

Sheets.—Sheet mill operations have been decreasing somewhat of late, chiefly on account of shortage of steel and fuel, although labor supply is a factor at a few points. In general, it is doubtful whether production in point of actual tonnage is at much above 75 per cent of capacity. The American Sheet & Tin Plate Co. has had to curtail its sheet mill operation slightly on account of the steel requirements of its tin plate mills and now has its sheet and tin mills equally scheduled to a 75 per cent operation. All producers are very reserved about making sales, being already well filled with business against their prospective rate of operation. New demand is far from insistent in point of tonnage. There are few sellers on the basis of 3.15c. common black and then only for rather indefinite delivery, while anything like prompt delivery would command a substantial premium. Prices on sheets are given on page 245.

Steel Skelp.—Several local makers report inquiry very active and say they can sell a good deal more skelp in the open market than they are able to turn out. The output has been going down in the last two weeks by reason of the coal strike and the slow movement of coal by the railroads. We continue to quote grooved and sheared skelp from 1.70c. to 1.80c. at mill, depending on the order.

Wire Rods.—While sellers of rods have not formally changed their quotations, they are indisposed to take on new commitments, unless from old and regular customers.

We quote No. 5 common basic or Bessemer rods to domestic consumers, $40; chain rods, $40; screw stock rods, $45; rivet and bolt rods and other rods of that character, $40; high carbon rods, $47 to $50, depending on carbon, per gross ton, f.o.b. Pittsburgh or Youngstown.

Coal and Coke.—Very little coke is being sold and standard furnace coke has brought $14 to $15 for a few small lots, while Connellsville steam coal ranges in price from $8 up to $9 per ton. It will be recalled that Secretary Hoover fixed a maximum of $3.50 per ton at mines for Connellsville coal, but the agreement is apparently forgotten by all operators, although they are delivering coal sold some time ago at low prices.

Old Material.—There is confusion in the local scrap market due to the orders issued by two or three mills to dealers to hold up shipments of heavy melting steel which was coming to them on contract. The mills have taken this action because of the coal and rail situation, as they will not need more scrap unless they have coal and coke with which to operate. In a certain sense this has created a weakness in the market. One steel company has bid $17.50, delivered, for a small tonnage of No. 1 steel scrap, but it has rejected much material lately and dealers are slow to sell to it. They can pick up steel at about $17. Another company is reported to have paid a railroad $19 for knuckles and couplers and to have paid a dealer $21 for the same grade. The market as a whole is quiet and no marked resumption of activity is expected until the coal and railroad troubles are out of the way. The prices quoted represent dealers' views as to what they would sell for under present conditions.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows per gross ton:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh	$17.25
No. 1 cast, cupola size	$19.00 to 20.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	17.00 to 17.50
Compressed sheet steel	15.50 to 16.00
Bundled sheets, sides and ends	14.50 to 15.00
Railroad knuckles and couplers	18.50 to 19.00
Railroad coil and leaf springs	18.50 to 19.00
Low phosphorus standard bloom and billet ends	20.50 to 21.00
Low phosphorus plates and other grades	19.00 to 20.00
Railroad malleable	16.00 to 16.50
Iron car axles	25.00 to 26.00
Locomotive axles, steel	24.00 to 25.00
Steel car axles	17.50 to 18.00
Cast iron wheels	18.50 to 19.00
Rolled steel wheels	18.50 to 19.00
Machine shop turnings	14.00 to 14.50
Sheet bar crop ends	19.50 to 20.00
Heavy steel axle turnings	15.50 to 16.00
Short shoveling turnings	15.00 to 15.50
Heavy breakable cast	18.00 to 18.50
Stove plate	15.00 to 15.50
Cast iron borings	16.00 to 16.50
No. 1 railroad wrought	15.00 to 15.50

Drastic Curtailment May Be Necessary

YOUNGSTOWN, OHIO, July 25.—The opinion is growing in industrial circles that drastic curtailments will occur in the steel industry after Aug. 1 unless transportation and coal mining difficulties are quickly adjusted. Plants are encountering much difficulty in maintaining schedules.

Shortage of pig metal forced suspension following the night turn Tuesday of No. 2 puddling mill of the A. M. Byers Co., Pittsburgh, at its Girard plant. This mill contains 44 puddling furnaces, of which 30 have been operating. The 30 active puddling furnaces in No. 1 mill will continue active until the end of the week, when they will also suspend. The company's blast furnace at Girard has been idle for several months because of inability to cover on fuel requirements.

The Brier Hill Steel Co. plans to bank Jeannette blast furnace this week because of coal shortage.

MANY BUSY PLANTS

Springfield, Ohio, Companies Busy in Spite of Strikes

SPRINGFIELD, OHIO, July 20.—A steady improvement in the business conditions of Springfield and vicinity is reported by the local manufacturers. President T. W. Ludlow, of the Springfield Malleable Iron Co., says that there is a good local demand for castings as well as from the general trade. The company has large orders from car works; also for small castings. At present the plant is being operated with about 80 per cent of its normal force. The company is well supplied with pig iron and coal, Mr. Ludlow says, so that he is not worried as a result of the strike.

The Ohio Steel Foundry Co. is operating with a good force of men, filling orders for the locomotive works at Lima and the Standard Car Co., Butler, Pa. There is a steady demand for castings for motor trucks and automobiles. The company is employing about 65 per cent of its normal force.

A slight improvement is noticed in the machine tool business, Edward Montanus, of the Springfield Machine Tool Co., said. This is especially true regarding the past few weeks. Mr. Montanus said, however, that as a result of the strike the railroad companies are holding up orders for machine tools.

Business is gradually getting better in the gas engine line, according to President H. C. Blake, of the Foos Gas Engine Co. The Superior Gas Engine Co. is operating with almost its normal force. It is getting out engines for the oil fields. The company has started the construction of an attractive office building, which will be of reinforced concrete and brick. During the last few years the company has completed the erection of a model plant, which it is estimated cost more than $500,000. P. J. Shouvlin is president of the company and director of the Mad River National Bank.

"We are running some overtime," said President A. F. Sparks, of the James Leffel & Co., manufacturers of water wheels. "Things are coming along well, and we are getting a number of good orders." Recently the company booked orders for turbines for cities in Indiana and other points in the Central West.

C. J. Burton, vice-president and treasurer the G. F. Burton Co., dealer in pig iron, who has just returned from a trip through Ohio and Indiana, says that there is a general improvement in conditions and that there is an increasing demand for pig iron.

Local agricultural implement manufacturing companies which have been running light for the past year are beginning to see encouraging signs for the future. The American Seeding Machine Co. is expecting good orders from South America and Australia. These should be received by the middle of August. President Frank C. Johnson says that prospects are good for a fair fall seeding machine trade, according to reports from the travelers and dealers.

Considering the lateness of the season, the motor truck and automobile manufacturing companies here are doing good business. While the Kelly-Springfield Motor Truck Co. is forging ahead on its schedule of trucks, owing to increasing orders, the Springfield works of the International Harvester Co. is not so active. It has been turning out an average of 50 high speed trucks since early spring. Lately this number has been reduced to 25 trucks per day.

The Westcott Motor Car Co. reports that business is holding up well and that indications are that July will be practically as good as June, which was the record month since 1920. This company is having difficulty in getting parts, which is delaying the assembling of the machines.

The big plant of the Robbins & Myers Co., motors and fans, closed Saturday, July 15, until July 31, for the annual inventory and vacation period. Indications are that there will be a steady improvement in orders for motors, the officers say. Normally this company employs 3200 persons. F. H. Hunting, of Fort Wayne, Ind., formerly with the General Electric Co., took charge as president of the Robbins & Myers Co.

Chicago

Strikes an Increasingly Important Factor in Prices and Production

CHICAGO, July 25.—The shadow of the restrictive influence of the coal and railroad strikes is rapidly falling on the iron and steel industry in this district, and, while as yet there has been no material decline in plant operations, the end of fuel reserves is only a few weeks off and unless there is an early change for the better, most of the producers now running at a relatively high rate will be forced to suspend. With coal stocks getting very low and with such new supplies as are available costing up around $12 to $13 a ton delivered, attention is diverted sharply to costs, and in the past few days there has been either a withdrawal by steel makers from the market or an advance in prices calculated to cover the indicated producing charges.

While the Steel Corporation subsidiary here still is taking business in the major products on a base of 1.75c., Chicago, independents generally have advanced prices $3 per ton to a base of 2c., Chicago. The Inland Steel Co. still is in a position to take on some gages of plates and small structural shapes, but on other products is out of the market and on plates and shapes it is picking its orders. Operations by this company still are placed at between 65 and 70 per cent. The Illinois Steel Co. is operating between 84 and 85 per cent, while the Interstate Iron & Steel Co. reports full operations.

An advance of $1 a ton in all grades of Northern iron is due less to the demand than to the fact that with costs steadily mounting, producers feel it is dangerous to gamble on an early settlement of labor troubles. There is not much hope that fuel will be plentiful and reasonable in the near future and only the advent of such a condition would make possible profitable production of iron at recent prices.

There seems to be no let up in the demand for steel from the automotive industry and there continues to be a good deal of urgency to the demand for railroad track supplies. Railroad business in general is pretty heavy, with the week's business including a sizable total of both locomotives and cars and much repair work about ready to be placed.

The most favorable word that can be said about the railroad strike in this territory is that it is not spreading beyond the shopmen. A strike of the Chicago surface elevated street railroad men threatens. This would be bad for industrial Chicago in view of the fact that a very large percentage of those engaged in business use the street railroads and also because the storage of coal is resulting in the cancellation of a good many suburban trains by the steam roads. If all the troubles which now threaten actually occur, it would cause no stretch of imagination to picture almost complete suspension of business activity.

Pig Iron.—Real activity is lacking in all grades and while a few sales of lots amounting to 500 tons have been put through, the more common purchase is of one or two carloads. We note sales of two 500-ton lots of Southern foundry at $18.50, Birmingham, for the base grade and there have been several smaller lots at the same figure. Other furnace interests continue to quote Southern foundry at from $19 to $20 at furnace for No. 2 grade, but without getting much business. A sale of 600 tons of No. 1 Northern iron is reported to an agricultural implement maker at the recent Chicago base. On the whole, there is more demand for shipments against contracts than there is for fresh supplies and that is surprising in view of the fact that if the blast furnaces are forced to suspend because of the fuel shortage, melters no doubt would be affected in the same way. The most recent sale of basic iron here was involving a round tonnage for delivery at the convenience of the maker at $24 and the new prices on this and other grades have been in effect for too brief a period to have yet found basis in sales. A sale of 400 to 500 tons of high silicon iron to one of the automobile manufacturers is reported to have been made for shipment from Jackson, Ohio, but full details are not available.

Quotations on Northern foundry, high phosphorus malleable and basic irons are f.o.b. local furnace and do not include a switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards, or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$31.65
Northern coke, No. 1, sil. 2.25 to 2.75	$25.50 to 26.50
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	25.00 to 26.00
Northern high phos.	25.00 to 26.00
Southern No. 2	24.50 to 26.00
Malleable, not over 2.25 sil.	25.00 to 26.00
Basic	25.00 to 26.00
Low phos. Valley furnace, sil. 1 to 2 per cent copper free	34.00 to 35.00
Silvery, sil. 8 per cent	37.29

Bars.—The supply situation in mild steel bars is growing more acute and while the Steel Corporation subsidiary has made no change from 1.75c. base, Chicago, the independents are decidedly stronger. The Inland Steel Co. has virtually withdrawn from the market and has no regular quotation, while other independents in a position to take on tonnages for relatively early delivery are talking 2c. minimum. There has been no let up in the demand; indeed, as a result of the fact that Eastern mills are falling behind instead of gaining upon their obligations, local mills are getting an increased number of inquiries. The Steel Corporation price, as for some time past, refers entirely to such business as buyers are willing to place for delivery at the convenience of the mill. Makers of hard steel bars are heavily committed for the present quarter and indisposed to commit themselves further until they have a definite line on what last quarter is going to produce with regard to the fuel, labor and transportation conditions. On iron bars, 2c. Chicago or mill now is minimum and one important maker having no stated quotation has to-day withdrawn all prices and is accepting specification only on the basis of price in effect at time of shipment. This development is solely ascribable to the shortage of coal and the probability of changing costs. Warehouse prices on bars and bar mill products have been advanced $2.40 to $3 per ton.

Mill prices are: Mild steel bars, 1.75c. to 2c., Chicago; common bar iron, 1.90c. to 2c., Chicago; rail carbon, 1.70c., mill or Chicago.

Jobbers quote 2.60c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.55c. for rounds and 4.05c. for flats, squares and hexagons. Jobbers quote hard and medium deformed steel bars at 2.50c. base; hoops, 3.60c.; bands, 3.35c.

Bolts and Nuts.—Jobbers and consumers are specifying fairly freely on contracts at the prices in effect prior to July 1. While new business is not large, there is a fair volume in the aggregate and at the new prices. The Michigan Bolt & Nut Co., Detroit, as of July 20, met the advance in machine carriage bolts and lag bolts made July 1 by other makers. Jobbing prices of rivets have been advanced $3 per ton and a further advance is indicated by the mill advance of $5 a ton made by Eastern makers, effective July 24. The full list of discounts will be found on page 245, except that, as to this territory, they are f.o.b. Chicago instead of Pittsburgh.

Jobbers quote structural rivets, 3.25c.; boiler rivets, 3.35c.; machine bolts up to ⅞ x 4 in., 50, 10 and 10 per cent off; larger sizes, 50 and 10 off; carriage bolts up to ⅞ x 6 in., 50 and 5 off; larger sizes, 45 off; hot pressed nuts, squares and hexagons, tapped, $3.25 off; blank nuts, $3.50 off; coach or lag screws, gimlet points, square heads, 60 per cent off; quantity extras are unchanged.

Wire Products.—The past week has shown a little more activity, although distributors still are more disposed to seek deliveries against old orders than to enter new orders. The leading interest still is several weeks behind in its deliveries and this condition throws much of the early shipment business to the independents, who, however, are generally quoting the Steel Corporation basis. Wire rods are scarce in this district and $40 per gross ton is the absolute minimum.

We quote warehouse prices, f.o.b. Chicago: No. 9 and heavier black annealed wire, $3.10 per 100 lb.; No. 9 and heavier bright basic wire, $3.25 per 100 lb.; common wire nails, $3.25 per 100 lb.; cement coated nails, $2.75 per keg.

Sheets.—The leading independent maker in this district within the past few days has practically withdrawn from the market. It is comfortably filled with business for the present quarter, and fearing higher costs, has instructed salesmen and branch offices to submit all inquiries. The general situation is a little

mixed. The automobile manufacturers figuring upon a big demand from the agricultural districts when money begins to flow back from the crops, still are running heavily and specifying freely for sheets. Demand for galvanized sheets also is good, but several of the independent mills are eager for business in black sheets. The market is not quotable above 3.15c., base, Pittsburgh, for black sheets, but on other finishes where prompt shipment is required, premiums are being obtained. A good many inquiries are coming to this market from consumers who are not getting full shipments from mills in the East. The automotive industry is being watched closely for signs of slowing up and there is conservatism about taking orders from irregular consumers in the fear that the business is merely a duplication of that already placed and would be cancelled on the first sign of an easier delivery situation.

Mill quotations are 3.15c. to 3.30c. for No. 28 black, 2.40c. to 2.50c. for No. 10 blue annealed and 4.15c. to 4.30c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote blue annealed, 3.75c.; black, 4.45c.; galvanized, 5.45c.

Plates.—It is increasingly difficult to place orders for plates for prompt deliveries and with many inquiries coming here on account of the inability of Eastern mills to accept new business, the price situation is growing stronger. The Steel Corporation subsidiary has made no change in base price, but it is doubtful whether independent makers would to-day take on business at less than 2c. The Inland Steel Co. is pretty heavily committed and while it can take some business in heavy material, it is asking its sales offices to submit all inquiries and has no stated price. About 30,000 tons of steel mostly plates will be required for the 3000 composite gondolas recently placed by the Illinois Central Railroad. There has been a marked revival in the demand for oil storage tanks and builders in this territory are figuring on a large number. Details of this business are not yet available. The warehouse price of plates has been advanced to 2.70c.

The mill quotation is 1.75c. to 2c., Chicago. Jobbers quote 2.70c. for plates out of stock.

Cast Iron Pipe.—No big projects are up at the moment, but an active demand for small tonnages is reported. There is no change in prices, either here or at Birmingham. Bids close July 27 on a job at Hinsdale, Ill.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $49.70 to $50.70; 6-in. and above, $45.70 to $46.70; class A and gas pipe, $3 extra.

Structural Material.—The Inland Steel Co. is accepting new business, except that which can be rolled on its small structural mill, with much caution and has no stated price. The Steel Corporation subsidiary still holds to 1.75c., Chicago, but is making no definite delivery promises on new business. The Chicago market appears quotable at 1.75c. to 2c., with the latter figure minimum where specific delivery is required. Structural lettings are more numerous than they have been and include a few of fair size. Jobbers have advanced the price of plain material out of warehouse to 2.70c.

The mill quotation on plain material is 1.75c. to 2c., Chicago. Jobbers quote 2.70c. for plain material out of warehouse.

Rails and Track Supplies.—There is no appreciable decline in the demand for track bolts, spikes, tie plates and angle bars and makers find it difficult to keep abreast of their orders. Not much new business is coming out in rails, but on standard sections, makers cannot make definite deliveries before October. Fairly prompt shipments can be made against new orders for light rails.

Standard Bessemer and open-hearth rails, $40; light rails rolled from new steel, 1.75c., f.o.b. makers' mills.

Standard railroad spikes, 2.25c. to 2.35c., Pittsburgh; track bolts with square nuts, 3.25c. to 3.35c., Pittsburgh; tie plates, steel and iron, 1.85c. to 2c., f.o.b. mill; angle bars, 2.40c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.30c. base and track bolts 4.30c. base.

Reinforcing Bars.—The Truscon Steel Co. has been awarded 100 tons for the packing plant for Katz & Horn, St. Paul. Other business done in the past week has involved only small tonnages. Pending business includes the Pine Grove Apartments, Chicago, 275 tons, and an office building for the Atchison, Topeka & Santa Fe Railroad, Newton, Kan., 125 tons.

Coke.—Available tonnages of foundry coke are very limited because of the shortage of coal and the hindrances to deliveries incident to the congestions and the railroad labor troubles. The local product is nominally quoted at $11.25, Chicago, and that from the South at $10.75. Not much of the latter is enroute and sales for the moment are nil.

Old Material.—Prices do not change much in this market. We note a slightly weaker tendency in the steel works grades, which are in light demand on account of the uncertainty as to the fuel supply. Compressed sheets are down about 50c. per gross ton. Cast iron borings also are weaker, but the market is stronger on malleable, which is in brisk demand from the malleable foundries and busheling also commands slightly more money this week than it did last week.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$18.50 to $19.00
Cast iron car wheels	19.50 to 20.00
Relaying rails	22.50 to 27.50
Rolled or forged steel car wheels	18.50 to 19.00
Steel rails, rerolling	16.25 to 16.75
Steel rails, less than 3 ft	17.50 to 18.00
Heavy melting steel	15.50 to 16.00
Frogs, switches and guards cut apart	15.50 to 16.00
Shoveling steel	15.00 to 15.50
Drop forge flashings	11.50 to 12.00
Hydraulic compressed sheet	13.00 to 13.50
Axle turnings	13.50 to 14.00
Per Net Ton	
Iron angles and splice bars	17.50 to 18.00
Steel angle bars	14.75 to 15.25
Iron arch bars and transoms	18.00 to 18.50
Iron car axles	22.50 to 23.00
Steel car axles	15.50 to 16.00
No. 1 busheling	12.25 to 12.75
No. 2 busheling	7.00 to 7.50
Cut forge	13.75 to 14.25
Pipes and flues	10.50 to 11.00
No. 1 railroad wrought	14.00 to 14.50
No. 2 railroad wrought	13.75 to 14.25
Steel knuckles and couplers	16.25 to 16.75
Coil springs	16.50 to 17.00
No. 1 machinery cast	17.00 to 17.50
No. 1 railroad cast	16.00 to 16.50
Low phos. punchings	15.00 to 15.50
Locomotive tires, smooth	13.00 to 13.50
Machine shop turnings	8.50 to 9.00
Cast borings	11.25 to 11.75
Stove plate	14.50 to 15.00
Grate bars	13.50 to 14.00
Brake shoes	14.00 to 14.50
Railroad malleable	16.00 to 16.50
Agricultural malleable	16.00 to 16.50

Plans of the Durant Motors Co.

It is announced that the Durant Motors Co. has organized a new company to be known as the Flint Motor Co., Flint, Mich., to manufacture a medium-priced automobile to be known as the Flint. The Durant Motors Co. takes possession this week of the former plant of the Willys Corporation at Elizabeth, N. J., which it recently purchased at public auction, and the plant at Long Island City, which has been used by the Durant company for assembly of the Durant automobile, will soon be utilized as an assembly plant for the Flint Motor Co. It has also been announced within the past few days that W. C. Durant, head of the Durant Motors Co., has been elected president of the Locomobile Co., Bridgeport, Conn., and plans for the expansion of the business of the latter company, which has been in the hands of a receiver, are under way.

A cast iron door, 15 x 16 in. in size, has been developed by the Conveyors Corporation of America, 326 West Madison Street, Chicago. It is designed especially for boiler settings thus to secure tightness against the leakage of air or gases. The bearing surfaces are machined and floating hinges pivoted to the door at the center are used.

New York

Coal and Coke Strikes Responsible for Feverish Condition of Market

NEW YORK, July 25.—The market is demoralized on account of the coal and railroad strikes causing scarcity of pig iron, coal and coke. A very limited tonnage of pig iron can now be obtained and the shortage of coke is causing great embarrassment. British coal and coke may check the rapid advance in prices of fuel. Considerable coal from England is now on the ocean.

Pig Iron.—The market is feverish and prices are rapidly advancing. In eastern Pennsylvania the lowest schedule announced within the past two days was $27 for No. 2 plain, $28 for No. 2X and $29 to $30 for No. 1X. One of the two companies having any iron to sell has advanced its base from $28 and is now quoting from $28 to $29. Reports from Buffalo indicate that the market is at least $26 on No. 2 plain and $26.50 on malleable, with $28 asked. No Virginia iron is obtainable and quotations on this grade are nominal. The A. P. Smith Mfg. Co., East Orange, is in the market for 450 tons of foundry iron for delivery in the first quarter of next year. There seems to be no probability of quotations being submitted soon for that delivery. A boiler company is in the market for 1000 tons No. 2X for delivery in August and September at its New York plant. A Springfield, Mass., melter is in the market for 1200 to 2200 tons for the remainder of the year. Prices on foreign iron are advancing, usual quotations being $27 seaboard on Scotch, $23.50 on French, and $25 on Middlesbrough.

We quote delivered in the New York district as follows, having added to furnace prices $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$31.77 to $32.77
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	30.77 to 31.77
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	29.77 to 30.77
Buffalo, sil. 1.75 to 2.25	30.91 to 31.91
No. 2 Virginia, sil. 1.75 to 2.25	29.44 to 30.44

Ferroalloys.—There is a demand for ferromanganese for prompt shipment, with very little available. Buyers have offered as high as $72.50 and $75, seaboard, for spot carloads and a few such sales have been made, resale material being supplied. One British agent with a small consignment due in August has sold several hundred tons at $67.50, seaboard, while others have gotten $70 on small lots. No domestic alloy is to be had before September and the coke shortage may affect this delivery. The Sheridan furnace of the Lavino Furnace Co. may be obliged to bank at any time because of lack of coke. Spiegeleisen is unchanged at $35 for the 16 to 19 per cent and $36, furnace, for the 19 to 21 per cent. Prices are lower on 50 per cent ferrosilicon. Makers who were quoting $55, delivered, are now willing to sell at $52, or possibly less.

Ferromanganese, domestic, seaboard, per ton,	$67.50 to $70.00
Ferromanganese, British, seaboard, per ton,	$67.50 to $70.00
Spiegeleisen, 17 to 19 per cent	$35.00
Spiegeleisen, 20 per cent	$36.00
Ferrosilicon, 50 per cent, delivered, per ton,	$52.00 to $55.00
Ferrotungsten, per lb. of contained metal	40c. to 50c.
Ferrochromium, 6 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr., delivered	12c. to 14c.
Ferrovanadium, per lb. of contained vanadium,	$3.00 to $3.50
Ferrocarbontitanium, 15 to 18 per cent, 1 ton to carloads, per ton	$200.00
Ores	
Manganese ore, foreign, per unit, seaboard	25c. to 26c.
Tungsten ore, per unit, in 60 per cent concentrates, nominal	$3.00 up
Chrome ore, basis 48 per cent Cr_2O_3, crude, per unit, Atlantic seaboard	40c. to 45c.
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	40c. to 45c.

Finished Iron and Steel.—Fuel shortage, occasioned in no small degree by transportation delays, is the all-important topic. An added number of mills will not consider any fresh business. Those mills which can still promise delivery in a few weeks are quoting premium prices, and even under these conditions do not favor relatively small tonnage orders involving a variety of sizes. More is heard of a repetition of conditions of 1920 in that there has been to some degree considerable duplication of orders. The minimum on heavy tonnage products appears still to be 1.70c., Pittsburgh, except to such large consumers as car builders. Round lots of merchant and reinforcing concrete bars have sold at 1.90c., Pittsburgh, under definite delivery promises.

We quote for mill shipments, New York, as follows: Soft steel bars, 2.04c. to 2.14c.; structural shapes, 2.04c.; bar iron, 1.94c.; and steel plates, 1.99c. to 2.04c. On export shipments the freight rate from Pittsburgh to New York is 28.5c. per 100 lb., while the domestic rate is 34c.

High Speed Steel.—Slightly increased activity is reported, but sales are still small. Producers continue to quote 18 per cent tungsten high speed steel at 75c. per lb., with special brands of some companies ranging up to 95c. per lb.

Warehouse Business.—Prices in this district on bars, structural material, hoops, bands and plates and blue annealed sheets have been increased 15c. per 100 lb. Black and galvanized sheets are still on the same schedule of 4.35c. and 5.35c. per lb. respectively, with this schedule very weak. The new price is evidently based upon 1.70c. per lb., base, Pittsburgh, with an effort to keep as close as possible to the $13 per ton spread that has prevailed for some time. Bars are now 2.73c.; structural material, 2.78c.; plates, 2.78c.; hoops, 3.78c.; bands, 3.38c., and blue annealed sheets, 3.78c. for No. 10 gage. The market continues fairly active, warehouses handling structural material reporting unusually good business in this line. Dealers in wrought iron and steel pipe report prevailing prices strong and very close to the official schedule. We quote prices on page 264.

Cast-Iron Pipe.—Activity in purchasing by both private and municipal interests continues strong, but the pig iron shortage is beginning to be felt. Foundries are still booked up for three to four months. No new municipal tenders or lettings are reported this week. We quote, per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $53.50; 4-in. and 5-in., $58; 3-in., $63.80, with $4 additional for Class A and gas pipe.

Coke.—While a sale of 25 cars of coke has been made at $12, ovens, the market has since advanced rapidly, and it is doubtful whether less than $14.50 could now be done on Connellsville coke. By-product coke is quoted at $12 to regular customers. The advance in foundry coke is due not only to increase in demand, but also to heavy freight rates due to the chartering of vessels for the importation of British coal.

Old Material.—Despite the general quietness in the market, prices on heavy melting steel are particularly stiff. Buying by Buffalo mills has warranted payment on No. 1 heavy melting steel up to as high as $11. This was on steel being shipped by barge to Buffalo, which takes a freight of only $2.25 per ton, compared with the railroad freight rate of $5.17. Higher prices in the Pittsburgh market have also tended to stiffen heavy melting steel. Specification pipe is quotable at $9 to $9.50 per ton. Prices being paid on heavy melting steel are now about $10.25 to $10.75, and on short length steel rails $11.25 to $11.75. Rerolling rails range from $11.50 to $12.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard	$10.25 to $10.75
Steel rails, short lengths, or equivalent	11.25 to 11.75
Rerolling rails	11.50 to 12.00
Relaying rails, nominal	27.00 to 28.00
Steel car axles	16.00 to 17.00
Iron car axles	22.00 to 23.00
No. 1 railroad wrought	12.50 to 13.00
Wrought iron track	11.00 to 11.50
Forge fire	8.00 to 8.50
No. 1 yard wrought, long	10.50 to 11.00
Cast borings (clean)	9.25 to 10.25
Machine-shop turnings	9.25 to 10.25
Mixed borings and turnings	9.25 to 10.25
Iron and steel pipe (1 in. diam., not under 2 ft. long)	9.00 to 9.50
Stove plate	10.00 to 10.50
Locomotive grate bars	11.50 to 12.00
Malleable cast (railroad)	10.50 to 11.00
Cast-iron car wheels	13.00 to 13.50

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast	$18.00 to $19.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	16.50 to 17.00
No. 1 heavy cast, not cupola size	13.00 to 13.50
No. 2 cast (radiators, cast boilers, etc.)	12.00 to 12.50

Philadelphia

Coal and Coke Shortage Is Crux of Present Situation—Prices Higher

PHILADELPHIA, July 25.—Although the Administration at Washington is not relaxing its efforts to bring about a settlement of labor troubles at coal mines and on the railroads, the pig iron and steel trade sees little hope of speedy improvement in the coal and coke supply, which is now being seriously restricted by the inability of railroads to furnish transportation. The first effect has been upon blast furnaces, and in addition to the several in the East which were reported last week as having banked, others have been similarly stopped. The Bethlehem Steel Co. has banked a furnace at Steelton and one at Sparrows Point, also having two banked at Bethlehem, as mentioned last week. The Midvale Steel & Ordnance Co. has banked one at its Johnstown plant and another will probably become idle this week, while the coke situation also threatens the one active Midvale stack at Coatesville. The Eastern Steel Co. has banked its furnace at Pottstown. Other furnaces are short of coke and may be forced to suspend. The Sheridan furnace of the Lavino Furnace Co., making ferromanganese, is in this position. Pig iron prices have been forced upward, the high prices being paid for such coke as is available leaving furnaces with no alternative but to ask more for their product.

In steel the situation is not yet so acute, but of course it will become so as soon as the effect of reduced pig iron output has spread to other departments. At present the situation is being helped out at some plants by stocks of cold steel on hand. Some steel companies are wholly or partly out of the market. The sources of supply for finished steel for prompt delivery are becoming fewer.

Pig Iron.—With the Warwick furnace banked on account of coke shortage, the Wharton furnace of the Replogle Steel Co. out of the market, the Bethlehem Steel Co. having no iron available for prompt delivery except some stock iron of off analysis, and other furnaces not anxious to sell in view of the possibility that they, too, may soon be affected by coke shortage, the present Eastern pig iron situation is not hopeful either from the buyer's or seller's point of view. The minimum at which foundry iron is now obtainable is $27 for No. 2 plain, $28 for No. 2X and $30 for No. 1X, f.o.b. furnace, with the sellers restricting their sales largely to regular customers. Fortunately for consumers, they appear to have their present needs covered and there is very little inquiry, but there is considerable pressure for deliveries on contracts.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia, and include freight rates varying from 76 cents to $1.64 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$27.76
East. Pa. No. 2X, 2.25 to 2.75	28.76
East. Pa. No. 1X	30.76
Virginia No. 2 plain, 1.75 to 2.25 sil.	$29.17 to 30.17
Virginia No. 2X, 2.25 to 2.75 sil.	30.17 to 31.17
Basic delivery eastern Pa.	25.75 to 26.75
Gray forge	25.50 to 26.00
Malleable	27.50 to 28.00
Standard low phos. (f.o.b. furnace)	30.00
Copper bearing low phos. (f.o.b. furnace)	30.00

Ferroalloys.—A few carloads of resale ferromanganese for prompt shipment have been sold at $72.50 and $75, seaboard, the buyers in one or two instances making the offers. Very little ferromanganese from abroad is available for August delivery, most of the British agents offering nothing earlier than September. For forward delivery $67.50, seaboard, is still quoted by domestic and British producers, but the buyer must pay whatever tariff may be legislated.

Semi-Finished Steel.—Open-hearth rerolling billets are quoted at $35, Pittsburgh, and forging billets at $40, Pittsburgh. There are few sales.

Plates.—With few mills offering plates for prompt shipment, the situation has become much tighter and price no longer is an important factor when consumers' needs are pressing. For prompt delivery 1.80c., Pittsburgh, is easily obtainable, and it is doubtful whether the average buyer can do much better, though the Pennsylvania Railroad, on 5000 tons of car repair material bought a few days ago, is said to have been quoted less than 2c., Eastern mills. The plate mills are harassed by diminishing coal reserves and receipts are so low that the effect of the shortage will soon be reflected in decreased operations.

Structural Material.—Although plain material is obtainable at 1.70c., Pittsburgh, the sources of supply at this price are narrowing. Probably not more than one or two Eastern mills will now accept orders for early shipment at 1.70c. In some instances, higher prices are being paid. An office building for Albert M. Greenfield, to be built at Chestnut and Fifteenth streets, requiring 2500 tons, is in the market.

Bars.—There is a scarcity of steel bars for prompt delivery at regular market prices. One Buffalo mill is quoting 2c., Pittsburgh. Another leading producer, which has been quoting 1.80c., Pittsburgh, is now out of the market. Some Eastern makers of bar iron have advanced their prices to 1.80c., Pittsburgh, for carload lots. One large producer is still quoting 1.60c., but may advance to 1.70c. this week.

Warehouse Business.—Local jobbers have advanced prices on nearly all items. Demands upon the warehouses for steel have increased since the railroad situation has made shipments more difficult. We now quote for local delivery out of stock as follows:

Soft steel bars and small shapes, 2.70c.; iron bars (except bands), 2.70c.; round edge iron, 2.90c.; round edge steel, iron finish, 1½ x ½ in., 2.90c.; round edge steel planished, 3.65c.; tank steel plates, ¼-in. and heavier, 2.80c.; tank steel plates, 3/16-in., 3c.; blue annealed steel sheets, No. 10 gage, 3.40c.; black sheets, No. 28 gage, 4.25c.; galvanized sheets, No. 28 gage, 5.25c.; square twisted and deformed steel bars, 2.80c.; structural shapes, 2.80c.; diamond pattern plates, ¼-in., 4.50c.; 3/16-in., 4.50c.; spring steel, 3.50c.; round cold-rolled steel, 3.35c.; squares and hexagons, cold-rolled steel, 3.70c.; steel hoops, No. 13 gage and lighter, 3.75c.; steel bands, No. 12 gage to 3/16-in., inclusive, 3.35c.; iron bands, 3.90c.; rails, 2.70c.; tool steel, 8c.; Norway iron, 5.50c.

Old Material.—There is very little activity in eastern Pennsylvania and such demands as exist for steel scrap come from the Pittsburgh district. Johnstown, Pa., has paid $16 for No. 1 steel and $16.50 for railroad steel. A Pittsburgh mill is offering $17.50. There has been a little demand for No. 1 railroad wrought and cast iron borings for chemical plants, with prices advancing. We quote for delivery at consumers' works in this district as follows:

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$15.00 to $15.50
Scrap rails	15.00 to 15.50
Steel rails, rerolling	17.00 to 17.50
No. 1 low phos., heavy 0.04 and under	22.00 to 24.00
Cast iron car wheels	17.50 to 18.50
No. 1 railroad wrought	17.50 to 18.50
No. 1 yard wrought	15.00 to 15.50
No. 1 forge fire	13.00 to 13.50
Bundled sheets (for steel works)	13.00 to 13.50
No. 1 busheling	12.50 to 13.00
No. 2 busheling	10.00 to 11.00
Turnings (short shoveling grade for blast furnace use)	13.00 to 13.50
Mixed borings and turnings (for blast furnace use)	13.00 to 13.50
Machine-shop turnings (for steel works use)	13.00 to 13.50
Machine-shop turnings (for rolling mill use)	13.50 to 14.00
Heavy axle turnings (or equivalent)	14.00 to 14.50
Cast borings (for steel works and rolling mills)	14.00 to 14.50
Cast borings (for chemical plants)	17.00 to 17.50
No. 1 cast	17.50 to 19.50
Railroad grate bars	14.50 to 15.00
Stove plate (for steel plant use)	15.00 to 15.50
Railroad malleable	15.00 to 15.50
Wrought iron and soft steel pipes and tubes (new specifications)	13.00 to 13.25
Shafting	20.00 to 20.50

Competitive examinations for engineering positions in the Interstate Commerce Commission and for an aeronautic engineer in the Navy Yard, Washington, are announced by the United States Civil Service Commission. Applicants should ask for blank 1312, stating that it is desired to take the examination for senior engineer, grade 2, in the one case and assistant aeronautic engineer in the other.

Cleveland

Pig Iron Advanced $2 to $3—Strikes More Seriously Felt

CLEVELAND, July 25.—The effects of the coal shortage due largely to the railroad shopmen's strike are being more seriously felt every day by blast furnaces and steel works in this district. While coal shipments from the Kentucky and West Virginia fields improved slightly during the week, stocks of some consumers are about exhausted and there has been some further curtailment in plant operations. M. A. Hanna & Co. have blown out their Cherry Valley furnace. Another Ohio furnace is scheduled to be banked in a few days, and the continued operation of one or two others is very uncertain. The McKinney Steel Co. has shut down three more open-hearth furnaces, and is now operating but seven out of 14.

Iron Ore.—Ore shipments by Northern railroads from the mines to the docks, which were cut down as a result of the shopmen's strike, have improved. The slowing down was due to lack of motive power, but some of the roads have been able to secure men for locomotive repair work. However, the situation is still bad on the Great Northern Railroad. The ore market is at a standstill. One inquiry for approximately 100,000 tons is pending, but very little activity is expected before the strike situation clears up. Boats are getting good despatch owing to the fact that having no coal cargoes they are going up the lake light and it is expected that the July movement will be close to 10,000,000 tons. The situation has not as yet compelled the tying up of any boats, although this may become necessary.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, $5.95; Old range non-Bessemer, 51½ per cent iron, $5.20; Mesabi Bessemer, 55 per cent iron, $5.70; Mesabi non-Bessemer, 51½ per cent iron, $5.05.

Ore Statistics.—Ore on hand at furnaces and Lake Erie docks, July 1, amounted to 25,367,087 tons, as compared with 30,066,465 tons on the same date a year ago. Furnace stocks July 1 amounted to 18,693,088 tons. During June there was consumed 3,388,027 tons of lake ore as compared with 3,293,964 tons during May.

Pig Iron.—Pig iron has advanced $2 to $3 per ton on foundry and malleable grades owing to the growing scarcity due to the shutting down of some furnaces and the withdrawal of other producers from the market. Three lake furnaces entirely stopped selling iron during the week because of the uncertainty as to future operations due to the fuel shortage and there is apparently only one producer in the northern Ohio and Valley districts that has any iron to offer at present. A Cleveland steel maker has purchased 5000 tons of basic iron from a local producer at $25 Valley, but it is doubtful whether any more could be had at that price. A West Virginia consumer has an inquiry out for 3000 tons of basic. Considerable inquiry for foundry iron came out during the week on which several producers declined to quote. Others booked several thousand tons. A local furnace sold several lots of foundry iron up to 1000 tons at $25 and then advanced its minimum price to $26 and its next quotation may be $27. Sales include a small lot of foundry iron at $26.50. A local furnace sold 400 tons for shipment to the Pittsburgh district at $26. Another lake furnace sold considerable foundry iron at $25 to $26. Sales of malleable iron have been made at $27. The minimum price on foundry iron in Buffalo and Detroit is now $26. A small lot of southern Ohio iron is available at $25. Southern iron is unchanged at $18.50. Shipments of Alabama iron have become very slow on account of the railroad situation and much of this iron is being routed in a roundabout way for Ohio delivery instead of through Cincinnati.

Quotations below are f.o.b. local furnace for Northern foundry iron, not including a 50c. switching charge. Other quotations except basic and low phosphorus are delivered Cleveland, being based on a $3.02 rate from Jackson and a $6 rate from Birmingham:

Basic, Valley furnace	$25.00
Northern No. 2 fdy., sil. 1.75 to 2.25	$26.00 to 26.50
Southern fdy., sil. 1.75 to 2.25	24.50
Ohio silvery, sil. 8 per cent	33.52
Standard low phos., Valley furnace	33.00

Semi-Finished Steel.—The leading Cleveland producers sold several lots of sheet bars, billets and slabs during the week at $35. There is considerable inquiry for forging billets in car lots. An Eastern mill is quoting these at $40 at mill, or about $43, Pittsburgh.

Finished Iron and Steel.—There is considerable inquiry for steel, but several mills are not taking on additional business because of their well-filled order books and the uncertainty about future operation. Consequently consumers are having difficulty in placing orders. Special forging steel and nut steel are scarcer than other items. New demand is largely for steel for early shipment and buyers seem willing to pay premium prices to secure quick deliveries. A local bolt and nut manufacturer paid 1.80c. for 200 tons of steel bars, that being the lowest price available for early shipment. Cleveland and some Valley district mills are quoting tank pates at 2c. to 2.10c. Some sales are reported at the lower price and orders have been booked at the higher price for quick shipment. On light plates 2.10c. is fairly common. There is an increase in demand for plates from boiler manufacturers. Considerable new work continues to develop in the building field.

Reinforcing Bars.—The demand for reinforcing bars continues heavy and some of the mills are getting behind on deliveries. Quotations on hard steel bars range from 1.75c. to 1.80c. The Concrete Steel Co. has taken 220 tons for the Louisville Gas & Electric Co., Louisville, Ky., 190 tons for a service building for the Vahey Oil Co., Youngstown, Ohio, and 130 tons for highway work near Dayton, Ohio. The Franklin Steel Co. has taken 230 tons for the West Seventy-third Street bridge, Cleveland. The general contract for the Roosevelt School, Dayton, Ohio, has been placed with the Wallbridge-Aldinger Co., Dayton.

Sheets.—Specifications continue heavy, but only a moderate amount of new business is coming out. The price situation seems somewhat easier in that several mills are quoting the American Sheet & Tin Plate Co. prices without delivery promises. However, there is considerable irregularity in the market and some mills are getting $3 per ton above the Steel Corporation's prices. One jobber reports car lot sales of galvanized sheets for mill shipment at 4.25c.

Cast-Iron Pipe.—Cleveland will receive bids July 28 for 1625 tons of 24 to 60-in. cast-iron pipe and for 155 tons of fittings for the water works department.

Warehouse Business.—Warehouse prices on steel bars, plates and structural material, hoops and bands, and blue annealed sheets have been advanced $3 per ton. Warehouse sales show an increase over June.

Jobbers quote steel bars, 2.56c.; plates and structural shapes, 2.66c.; No. 9 galvanized wire, 3c.; No. 9 annealed wire, 2.50c; No. 28 black sheets, 4c.; No. 28 galvanized sheets, 5c.; No. 10 blue annealed sheets, 3.50c. to 3.61c.; hoops and bands, 3.21c.; cold-rolled rounds, 3.30c.; flats, squares and hexagons, 3.80c.

Bolts, Nuts and Rivets.—Specifications on bolt and nut contracts are heavy and include good orders from the railroads in spite of the shopmen's strike. The market is firmer and there is less disposition than recently among some makers to shade regular quotations. The leading local rivet manufacturer Monday advanced prices $5 per ton on structural and boiler rivets and has discontinued making contracts. The price advance and refusal to make further commitments is due to the inability to place additional orders for steel for early requirements, except at premium prices, and to uncertainty about future steel prices. It is understood that other manufacturers will make similar advances. Structural rivets are now quoted at 2.65c. and boiler rivets at 2.75c. Small rivets have advanced, 70 per cent off list now being the general quotation and 70 and 5 per cent off list the extreme discount.

Coke.—The coke situation has become more acute. Considerable new inquiry is coming out for foundry coke, but practically none is available. Very little of

the Virginia coke recently sold to Ohio consumers is coming through to its destination because of the railroad situation. The last sale of Connellsville foundry coke was at $13. We note the sale of ten cars of Indianapolis by-product foundry coke at $10 to a Cleveland consumer. One Virginia interest is still booking orders from its regular foundry customers at $7.

Old Material.—Owing to the uncertainty as to future mill operations because of the fuel situation and the resulting absence of demand, there has been a further softening in scrap prices of about 25c. a ton on both steel making and blast furnace grades. Mills generally are taking material on contracts, but are declining to buy for future requirements. Dealers are making little attempt to do any business. Small lot purchases of heavy melting steel by dealers to cover old orders are reported at $14.75.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel	$14.75 to $15.00
Steel rails, under 3 ft	15.25 to 15.50
Steel rails, rerolling	15.75 to 16.25
Iron rails	14.00 to 15.00
Iron car axles	18.00 to 19.00
Low phosphorus melting	16.00 to 16.25
Cast borings	12.25 to 12.50
Machine shop turnings	11.50 to 12.00
Mixed borings and short turnings	12.00 to 12.50
Compressed steel	12.25 to 13.25
Railroad wrought	14.00 to 14.50
Railroad malleable	15.50 to 16.00
Light bundled sheet stampings	10.00 to 10.25
Steel axle turnings	13.00 to 13.50
No. 1 cast	17.00 to 17.50
No. 1 busheling	10.50 to 10.75
Drop forge flashings over 10 in	10.50 to 10.75
Drop forge flashings under 10 in	10.50 to 10.75
Railroad grate bars	13.75 to 14.25
Stove plate	13.75 to 14.25
Pipes and flues	10.00 to 11.00

Birmingham

BIRMINGHAM, ALA., July 25.

Pig Iron.—Although little business was done outside of the bookings by one large foundry interest in the St. Louis, Cincinnati and Chicago markets, and the placing of a large tonnage by a pipe maker, the Birmingham iron base at the close of the third week of the month seemed nearer $19 to $20 than $18.50 to $20, the large maker, retiring from a former $18 minimum, also retiring from a later $18.50 minimum. Sales of recent occurrence have included 1000 tons to a pipe maker, lots of 2000 and 4000 booked in Chicago territory, lots of 300 and 400 tons to Kansas City and St. Louis and 760 tons to a Louisville melter. It is also understood that the United States Cast Iron Pipe & Foundry Co. has bought 20,000 tons, paying base of $18.50. Reports of extremely large tonnages booked by pipe concerns are a rehash of news published in June. Withdrawal of the large maker quoting $18.50 from that base is accepted as indicating the end of that price. One maker holding for $20 for fourth quarter is selling third quarter at $19 and that is about the base for that business for such as can be had. Rather more pipe iron for fourth quarter delivery appears to have been taken than was estimated. However, there is no hurry in that quarter. Neither steel mill nor furnace operations had been affected from production standpoint by the railroad strike up to the close of the week and this week's operations were likewise assured of non-interruption. The leading interest has not lost a turn of a wheel in any department. Where one company is short on full coal supply there is ample coke on hand. Deliveries are handicapped.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	$18.50 to $20.00
Basic	18.50 to 19.00
Charcoal, warm blast	30.00 to 32.00

Finishing Mills.—The strike has not interfered with steel mill operations. The Tennessee company is continuing its double turn in finishing mills. The Gulf States Steel Co. and American Steel & Wire Co. are at full turn. The Conners Steel Co. is busy on cotton ties and has trouble in deliveries. The Southern Pacific's order for 35,000 tons of rails to be rolled at Ensley is for 1923 delivery.

Cast Iron Pipe.—The United States Cast Iron Pipe & Foundry Co. booked 10,000 ft. of 24-in. pipe for Wilmington, N. C., following 12 miles of 16-in. for Hendersonville and 6½ miles for Morgantown, N. C., and numerous other Southern bookings. Belated customers are placing orders even when delivery is not promised under 90 to 120 days. The base is $37 and $38 can be had in many instances for the asking. Sanitary pipe continues to sell at $65 for standard and $60 for extra heavy. Coast movements are continuously heavy.

Coal and Coke.—The rail strike has upset the coal field nearly 50 per cent, especially on the Southern Railway, while other roads, especially the Louisville & Nashville, are doing much better. In one instance motor trucks are moving coal from mines to Illinois Central cars. Spot coal base has moved up to $3.

Old Material.—Steel scrap has become active with numerous buyers. In some instances it has sold as low as $11, but general quotations are unchanged.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails	$13.00 to $15.00
No. 1 steel	12.00 to 14.00
No. 1 cast	15.00 to 16.00
Car wheels	14.00 to 15.00
Tramcar wheels	13.00 to 14.00
Stove plate	13.00 to 14.00
Cast iron borings	6.00 to 7.00
Machine shop turnings	4.00 to 5.00

St. Louis

ST. LOUIS, July 25.

Pig Iron.—The market for pig iron continues strong. Prices are unchanged at $24.50, Chicago, for deferred shipment and $25 for prompt shipment for Northern iron, and $18.50 to $20, Birmingham, for the Southern product. The increasing difficulties besetting makers of pig iron through the shortage of coal and its steadily mounting prices are expected to cause further advances in the price of iron. The principal inquiries are for high-silicon iron, of which there is a scarcity, the local maker beng entirely out of these grades. Buying for the week was confined largely to lots of a carload up to 300 tons, although not of any great volume. The Sheffield maker quoting the lowest price for Southern iron did only a small business during the week. The melt in the district still is heavy, and melters are asking for quick shipments of orders already placed. A Des Moines, Iowa, melter is in the market for from 1000 to 1500 tons of foundry iron, and an Indiana concern wants 1000 to 1500 tons of malleable. A concern in the district wants several hundred tons of ferromanganese; otherwise the ferroalloy markets are quiet. As the Southern Railroad and the Louisville & Nashville have not yet filed with the Interstate Commerce Commission their proposed rate of $4.22 from Birmingham to St. Louis, we are using the $5.17 rate announced July 1.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago and $5.17 from Birmingham and 81 cents average switching charge from Granite City:

Northern foundry, sil. 1.75 to 2.25 (third quar.)	$26.66
Northern malleable, sil. 1.75 to 2.25 (third quar.)	26.56
Basic (third quar.)	26.56
Southern foundry, all rail, sil. 1.75 to 2.25	24.48
Southern foundry, water and rail, sil. 1.75 to 2.25, f.o.b. St. Louis	22.17

Finished Iron and Steel.—Local fabricators have had some difficulty in placing orders for from 50 to 100 tons, as the shortage of coal and heavy orders have put some of the largest concerns out of the market altogether, while others are declining most business submitted to them. The steel for the Missouri, Kansas & Texas Railway shops at Denison, Texas, amounting to 350 tons, has been let to the Mississippi Valley Structural Steel Co. Local concerns are interested in the building of the American Can Co., New Orleans, Favrot & Livaudais, architects, involving a considerable tonnage of reinforcing bars and a small amount of structural steel. The Missouri, Kansas & Texas Railway purchased 2500 kegs of standard track spikes, dividing the order among several concerns. Other railroad inquiries

were for small quantities, items that should come from warehouses.

For stock out of warehouse we quote: Soft steel bars, 2.57½c. per lb.; iron bars, 2.57½c.; structural shapes, 2.67½c.; tank plates, 2.67½c.; No. 10 blue annealed sheets, 3.72½c.; No. 28 black sheets, cold rolled, one pass, 4.45c.; cold drawn rounds, shafting and screw stock, 3.50c.; structural rivets, $3.19½ per 100 lb.; boiler rivets, $3.29½; tank rivets, 7/16 in. and smaller, 60 per cent off list; machine bolts, large, 50 and 10 per cent; small, 50-10 and 10 per cent; carriage bolts, large, 55-5 per cent; small, 60 and 10 per cent; lag screws, 60 per cent; hot pressed nuts, square or hexagon blank, $3.50; and tapped, $3.25 off list.

Coke.—An avalanche of orders for coke has swept down on everyone in the trade here. Orders have come in exceedingly heavy volume not only from the industries, but from the coal trade as well. The St. Louis by-product producers are out of the market. The Granite City producers have taken on a very big tonnage. Their plant is at full capacity, but orders exceed that and they have been drawing on their storage stocks. In addition to the business that has resulted as a result of the coal strike and other concerns being out of the market, coke on gas contracts is being supplied. The price of coke is steadily mounting on account of the abnormal cost of coal, its scarcity and rising prices. At mines where there is coal to be had, its movement is hampered by the railroad strike. Connellsville coke is most difficult to get. Some Alabama coke is being shipped in here.

Old Material.—The old material market continues to show strength, and most items are higher. Very little material is moving on account of the railroad strike, and it is difficult to get cars in which to make shipments. There are no railroad offerings, as the roads are without the labor to handle old material. The demand for rolling mill grades is good, a little going out of the district.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

	Per Gross Ton	
Old iron rails	$16.75 to	$17.25
Steel rails, rerolling	15.75 to	16.25
Steel rails, less than 3 ft	16.25 to	16.75
Relaying rails, standard section	25.00 to	28.00
Cast iron car wheels	18.25 to	18.75
No. 1 heavy railroad melting steel	14.75 to	15.25
No. 1 heavy shoveling steel	13.75 to	14.25
Ordinary shoveling steel	13.75 to	14.25
Frogs, switches and guards, cut apart	15.25 to	15.75
Per Net Ton		
Heavy axle and tire turnings	9.50 to	10.00
Steel angle bars	13.75 to	14.25
Iron car axles	23.50 to	24.00
Steel car axles	17.00 to	17.50
Wrought iron bars and transoms	19.00 to	19.50
No. 1 railroad wrought	13.50 to	14.00
No. 2 railroad wrought	13.00 to	13.50
Railroad springs	16.00 to	16.50
Steel couplers and knuckles	16.25 to	16.75
Cast iron borings	9.00 to	9.50
No. 1 busheling	11.75 to	12.25
No. 1 railroad cast	15.50 to	16.00
Stove plate and light cast	12.75 to	13.25
Railroad malleable	14.00 to	14.50
Pipes and flues	8.75 to	9.25
Machine shop turnings	9.25 to	9.75

Buffalo

BUFFALO, July 25.

Pig Iron.—The situation in the pig iron industry here is most serious and practically all the furnaces see the end of operations on the basis of their present coke commitments. Although no furnaces have been banked, two interests have curtailed their blast in an effort to extend operations for a longer period. The rail situation has precipitated what is close to a crisis, in the sense that where furnaces were able to get some supplies of coke, deliveries have been delayed and the likelihood that stacks will be banked looms closer. Rogers, Brown & Co. are out of the market. While they have had little iron available for some weeks, the statement is now made that absolutely none is for sale. For No. 2 foundry $26 appears to be the price on the few sales that have been made, and $27 has been done on malleable where a small tonnage was concerned. No big sales have been made, and inquiry has been rather quiet with all sellers.

We quote f.o.b. per gross ton Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sil	$27.00
No. 2X foundry, 2.25 to 2.75 sil	26.50
No. 2 plain, 1.75 to 2.25 sil	26.00
Basic	25.00
Malleable	26.50
Lake Superior charcoal	31.78

Finished Iron and Steel.—All the producers of this section are in a serious condition, and none is able to forecast just how long operations will continue. The local branch of an independent has received orders to withdraw from the market on all products, although it was able to take only limited tonnages of bars and shapes. Inquiry is brisk for all materials. Reduced operations have had the effect of further delaying deliveries. The independent referred to was quoting 1.70c. on bars before it formally withdrew. A local bar maker is understood to have booked 1000 tons at 1.80c. with delivery in six to eight weeks. One interest is able to take pipe business in a limited way, but only from its established trade and these tonnages are booked for 60 to 90 days deliveries. Intimations from the trade have been that an advance in pipe prices could be expected. One company is understood to be quoting 2c. on bars. An advance is expected in sheet prices by one local factor, but no announcement is to be made, at least for the present. Sheet inquiry is good, but the tonnages are not especially big. No maker of finished material has more than from two to three weeks supply of fuel ahead.

Warehouse Business.—Effective July 20, prices have advanced. Business is especially brisk in bars and structural materials, and is good in all lines. With the curtailment of mill operations a greater volume of business is reaching all warehouses.

We quote warehouse prices, Buffalo, as follows: Structural shapes, 2.85c.; plates, 2.85c.; soft steel bars, 2.75c.; hoops, 3.55c.; bands, 3.40c.; blue annealed sheets, No. 10 gage, 3.80c.; galvanized steel sheets, No. 28 gage, 5.60c.; black sheets, No. 28, 4.60c.; cold rolled round shafting, 3.55c.

Old Material.—The railroad shop strike is beginning to have a serious effect on the scrap market, and while prices are firm, mills are not especially anxious to buy the last few days. The strike is interfering with the movement of cars and deliveries are going to be delayed with scrap recently purchased from railroads. There have been no big sales and dealers expect none until the fuel situation is relieved in some manner.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel	$16.75 to $17.00
Low phos., 0.04 and under	18.00 to 19.00
No. 1 railroad wrought	16.00 to 16.50
Car wheels	17.00 to 18.00
Machine shop turnings	10.50 to 11.00
Cast iron borings	14.00 to 14.50
Heavy axle turnings	14.00 to 14.50
Grate bars	14.00 to 14.50
No. 1 busheling	15.00 to 15.50
Stove plate	15.00 to 15.50
Bundled sheet stampings	11.50 to 12.00
No. 1 machinery cast	18.00 to 18.50
Hydraulic compressed	15.00 to 15.50
Railroad malleable	17.00 to 17.50

Boston

BOSTON, July 25.

Pig Iron.—The largest individual sale reported in this territory the past week is 500 tons No. 1 foundry lake charcoal iron at $28.50 furnace base, to an eastern Massachusetts melter. Business otherwise ranged from car lots to 150 tons, mostly Buffalo at $25.50 furnace for silicon 2.25 to 2.75 and $26.50 to $26.75 for silicon 2.75 to 3.25. Eastern and western Pennsylvania, Virginia, Alabama and foreign iron sales were made on base prices previously reported. Aggregate sales of all kinds of iron fell considerably short of 3000 tons. A Springfield, Mass., melter is inquiring on 500 to 1000 tons of silicon 2.25 to 2.75, 500 to 1000 tons of silicon 2.75 to 3.25, and 250 tons of silicon 4.50 to 5.50, last quarter shipment. In the last two or three days, numerous small inquiries from foundries not receiving contract iron ordered heretofore have come into the market. A Buffalo furnace has again withdrawn from the market, thereby complicating the third quarter shipment market, inasmuch as brokers have few other domestic irons to offer. It is expected prices will advance within the next ten days on the strength of emergency inquiries. More or less foreign iron, mostly Scotch and English, is offered at August and later deliveries. Prices range from around $26, upward, c.i.f. Boston and other Atlantic seaboard points, depending on the urgency of the foundry's needs. New England

foundries, so far, however, have not manifested much interest in foreign irons.

We quote delivered at common New England points as follows, having added to furnace prices $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75	$30.15 to $30.65
East. Penn., sil. 1.75 to 2.25	29.65 to 30.15
Buffalo, sil. 2.25 to 2.75	29.91 to 30.41
Buffalo, sil. 1.75 to 2.25	29.41 to 29.91
Alabama, sil. 2.25 to 2.75	28.60 to 30.10
Alabama, sil. 1.75 to 2.25	28.10 to 29.60

Warehouse Business.—The following advances have been made, per 100 lb., in local warehouse prices: toe calk steel, $1; steel bands 6 in. wide x ⅛ in. thick, 72c., and 3/16 in. thick, 57c.; plain round and square concrete bars, 25c.; 3/16 in. thick plates, 16½c.; soft steel bars, flats, deformed bars, structural steel, tire steel, hoop steel, half rounds, ovals and bevels, and refined iron, 15c. Sheets, open-hearth and crucible spring steel, cold rolled steel, best refined iron, Wayne and Norway iron remain as heretofore. The movement of iron and steel out of warehouses has no more than held its own. Stocks are in better shape, however, because of recent arrivals from mills. Steel bands appear to be in shorter supply than other products. Bolts and nuts are moving in average quantities for this time of the year. Large rivets are in slightly better demand.

Jobbers quote: Soft steel bars, $2.75½ per 100 lb. base; flats, $3.40½; concrete bars, $2.90 to $3.03; structural steel, $2.75½ to $2.90½; tire steel, $4.15 to $4.50; open-hearth spring steel, $4.50 to $6; crucible spring steel, $11.50; steel bands, $3.90; hoop steel, $4.40; cold rolled steel, $3.50 to $4; refined iron, $2.75½; best refined iron, $4.25; Wayne iron, $5.50; Norway iron, $6 to $6.50; plates, $2.85½ to $3.04; No. 10 blue annealed sheets, $3.75 per 100 lb. base; No. 28 black sheets, $4.90; No. 28 galvanized sheets, $5.90.

Old Material.—Pennsylvania mills have withdrawn from the New England old material market as a result of the coal and railroad labor situations. The trade here takes this action to mean that mills either have all the old material needed or expect reduced operations. The local market for heavy melting steel, pipe, bundled skeleton, etc., therefore, was flat the past week. Prices on mixed borings and turnings are 50c. to $1 a ton lower, according to the material, due to a lack of buying orders and increased offerings. Quotations otherwise remain unchanged. A small demand remains for cast iron borings suitable for chemical purposes at $11.50 to $12 f.o.b. cars shipping point, but material is lacking because of the inactivity of textile machinery making plants. New England foundries continue to supply themselves with machinery cast from local or nearby yards. Boston dealers find this kind of competition difficult to overcome. Sales of car lots therefore are few and far between.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$19.00 to $20.00
No. 2 machinery cast	17.00 to 18.00
Stove plate	14.00 to 14.50
Railroad malleable	15.00 to 15.50
Street car wheels	18.00 to 19.00

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$11.00 to $11.50
No. 1 railroad wrought	11.50 to 12.00
No. 1 yard wrought	10.00 to 10.50
Wrought pipe (1 in. in diam., over 2 ft. long)	8.00 to 8.50
Machine shop turnings	8.50 to 9.00
Cast iron borings, rolling mill	9.50 to 10.00
Cast iron borings, chemical	10.50 to 12.00
Blast furnace borings and turnings	8.50 to 9.00
Forged scrap and bundled skeleton	8.00 to 8.50
Street car axles and shafting	14.50 to 15.00
Rerolling rails	11.00 to 11.50

Coke.—New England producers of by-product foundry coke are quoting spot fuel at $14.50 to $15, delivered, where the local freight does not exceed $3.10, and have advanced contract coke from $13.50 to $15.50, delivered. The contract price now is equal to $12.40 per ton at oven, or $5.65 a ton above the low price quoted this year and $4.89 a ton above the oven price a year ago. The producers also have advanced crushed coke $1 a ton, making the spot price $13 f.o.b. ovens and the contract $12, while $13.50 is charged on tonnages delivered outside of New England. Producers are experiencing considerable difficulty in maintaining adequate high volatile coal for mixture purposes in producing coke. Foundries, fearful of deferred deliveries, due to railroad labor troubles, are making heavy demands on coke producers. A Connecticut brass manufacturer during the past week closed on 1000 tons of crushed coke on a basis of $14.25, Boston.

Cincinnati

CINCINNATI, July 25.

Pig Iron.—The market this week shows little life, and while the price situation is a little stronger, actual transactions are few and far between. The melters appear to have taken the attitude that it would be practically useless to buy iron while the coal and rail strikes are on, as they feel that with the interruption of railroad traffic they would stand little chance of getting iron should they come into the market. With present conditions continuing there is bound to be a scarcity of iron. Several furnaces now operating in the Ironton-Ashland district are on the ragged edge for coke and unless coal is moved to the ovens will shut down. Sales during the week included a number of 100-ton lots, with three totaling 500 each reported. A central Ohio melter bought 500 tons of malleable at a reported price of $25.50, southern Ohio furnace, and another district melter 500 tons of foundry at $18.50, Southern furnace. A southern Ohio melter took 500 tons of Southern foundry for fourth quarter shipment on an $18.50 Birmingham, base, on Northern irons. With the exception of a lake furnace, which is reported to have booked an order for 300 tons at $23, prices are up from 50c. to $1 a ton. Ironton producers are now quoting a minimum of $24.50 Ironton, and Chicago district stacks are quoting $25. In the South $18.50 appears to be the minimum, as the low priced seller was booking orders at this figure last week. There is some resale Southern available at $18, but the tonnage is reported to be rather light. The only inquiry of consequence is from northern Ohio for 300 tons of foundry for immediate shipments.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$22.55
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	23.05
Ohio silvery, 8 per cent	34.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	26.77
Basic Northern	27.27
Malleable	26.77

Plant Operations.—The rail and coal strikes, while causing some inconvenience to mills in this district, have not as yet seriously interfered with operations. Blast furnaces operating in southern Ohio are still being supplied with coke by their connections, and while the outlook is not at all bright, it is hoped that something may develop shortly that will enable them to keep running. Most of the steel plants in this district receive their coal supplies through river shipments, and are therefore in a good position to keep operating regardless of a railroad tie-up. Delay in railroad transportation is the only thing that will necessitate shutdowns.

Finished Material.—A number of independent steel companies have withdrawn from the market, owing to their inability to make deliveries, and will bend every effort to take care of orders now on their books. The demand for finished materials is rather quiet, due to the general upset caused by the rail and coal strikes. Consumers are urging the mills to make shipments, and are bending every effort to get materials in before the congestion becomes more serious. Prices have an advancing tendency, but it appears to be the policy of the mills to prevent, if possible, a runaway market. On bars, shapes and plates, the ruling quotations are 1.70c. to 1.80c., the higher figure being named for early delivery, while the lower price generally refers to orders booked for shipment at mills' convenience. We note an order for 400 tons of bars booked by an independent company during the week at 1.80c., Pittsburgh, with no definite delivery asked. Inquiries for plates from car equipment companies are coming to the front. A Middle West car builder, which recently booked an order for 1000 cars, and which has also taken on a large order for car repair work, is understood to have placed a sizable tonnage of plates with the leading interest. An Eastern mill is quoting plates in this district at 2.10c., Pittsburgh, but the ruling price is generally

1.70c. On sheets demand for automobile body stock continues heavy, seconds commanding the same price as primes. The market generally can be quoted at a range from 4.50c. to 4.85c. Black, galvanized and blue annealed sheets are in fair demand, prices ranging from 3.15c. to 3.40c. for black, 4.15c. to 4.30c. for galvanized, and 2.40c. to 2.50c. for blue annealed. Wire products are showing more activity, due undoubtedly to the desire on the part of jobbers to round out their stocks before the railroad situation becomes acute. Inquiries for pipe are fairly numerous, with mills quoting three months' delivery. In the structural field no new inquiries of size have come out, and the number of awards fell off considerably. A number of projects on which bids have been taken have been deferred for the time being.

Warehouse Business.—Local jobbers of iron and steel products report a heavy demand for immediate shipment, a local warehouse booking an order for 125 tons of small angles for shipment out of stock. Prices, following similar announcements from the Pittsburgh district, have been advanced $3 per ton on most products. Sheets are moving in better volume, and bolts and nuts are also picking up.

Jobbers quote: Iron and steel bars, 2.75c. base; hoops, 3.60c.; bands, 3.35c. base; shapes and plates, 2.85c. base; reinforcing bars, 2.82½c. base; cold-rolled rounds, 3.35c. base; flats, squares and hexagons, 3.85c. base; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, 4.50c.; No. 28 galvanized sheets, 5.50c.; No. 9 annealed wire, $2.70 per 100 lb.; common wire nails, $2.85 per keg, base.

Tool Steel.—The demand for tool steel shows a slight falling off, due entirely to the unsettled condition caused by the coal and rail strikes. Operations at some local manufacturing plants are being interfered with to a slight extent, and the outlook for the immediate future is not encouraging. Prices are unchanged, 18 per cent tungsten high speed steel being quoted at 75c. per lb. base.

Coke.—There is a heavy demand for coke for prompt shipment and prices are rising rapidly. Connellsville foundry coke is quoted at $14, New River at $8.50 to $11, Wise County at $9.50 to $10, ovens, and by-product fuel at $9, Connellsville basis. Transportation is being seriously interferred with, but coke producers report that railroads are still accepting cars for shipment subject to delay. To date there has been little interference with foundry operations, but this week will likely see a number of plants shut down on account of coke shortage.

Old Material.—There is little more activity in the scrap market, all transactions being for delivery within the next 30 days. Steel and cast are in better demand. Some mills have asked dealers to withhold shipments until the transportation question is settled one way or another. Prices, while having a softer tendency, remain unchanged.

We quote dealers' buying prices, f.o.b cars Cincinnati:

	Per Gross Ton	
Bundled sheets	$8.00 to	$8.50
Iron rails	13.50 to	14.00
Relaying rails, 50 lb. and up	26.50 to	27.00
Rerolling steel rails	13.50 to	14.00
Heavy melting steel	13.00 to	13.50
Steel rails for melting	13.00 to	13.50
Car wheels	14.50 to	15.00
	Per Net Ton	
No. 1 railroad wrought	11.50 to	12.00
Cast borings	9.00 to	9.50
Steel turnings	8.00 to	8.50
Railroad cast	14.00 to	14.50
No. 1 machinery	16.00 to	16.50
Burnt scrap	9.50 to	10.00
Iron axles	18.00 to	18.50
Locomotive tires (smooth inside)	11.00 to	11.50
Pipes and flues	6.50 to	7.00

Freight Rates on Pig Iron from Birmingham

As the Louisville and Nashville and Southern railroads notified Birmingham iron makers July 10 that the rate on pig iron from Birmingham to Cincinnati would be $3.53 and the rate from Birmingham to St. Louis $4.22, THE IRON AGE, in its issues of July 13 and July 20, published those as the prevailing rates, instead of the rates of $4.05 to Cincinnati and $5.17 to St. Louis, which became effective July 1, succeeding the rates of $4.50 to Cincinnati and $5.70 to St. Louis. On Monday of this week the railroads made the following announcement:

> Effective Sept. 1, rates on pig iron from Birmingham and intermediate points to St. Louis and other places taking the St. Louis rate will be reduced 26.48 per cent from the rates in effect June 29. Rates from Birmingham to Cincinnati, Louisville, Evansville and other crossing points will be reduced 21.55 per cent from the rates in effect June 29. Rates to Cleveland, Chicago and other points in Central Freight Association territory will remain unchanged, as northern roads would not come into agreement.

Hence THE IRON AGE this week quotes the rates which became effective July 1, namely, $4.05 from Birmingham to Cincinnati and $5.17 from Birmingham to St. Louis.

More Metal Workers at Higher Wages

Iron and steel plants, according to figures of the Bureau of Labor Statistics, show for June a gain over May of 7256 employees in 106 establishments. This gain of 5.3 per cent was accompanied by a gain of 6.7 per cent in amount of payroll and a corresponding gain in the average pay envelope from $46.77 to $47.41, or 1.3 per cent.

In the automobile industry the gain in 44 establishments was 22 per cent in number of employees and 7.7 per cent in payroll total. In car building and repairing there was a gain of 6.9 per cent in number of employees in 61 establishments, and a gain of 10.6 per cent in amount of payroll.

Wages in car building and repairing, due to the continuance of war time wages in railroad repair shops, are considerably higher than in the steel industry. The excess in June over steel mill wages was 26.5 per cent and that in May was over 24 per cent. Wages in automobile plants, which are exceptionally busy, were 52.7 per cent over those prevailing in steel plants, and not so much as in May when the excess was 59 per cent. Details are shown in the table.

Period	Number of Establishments	Number of Men	Half-Month Payroll	Average Pay Envelope
Iron and Steel				
May, 1922	106	137,170	$6,415,178	$46.77
June, 1922	106	144,426	6,847,174	47.41
June, 1921	110	110,572	4,907,968	44.38
*Automobiles**				
May, 1922	44	100,800	7,257,400	72.00
June, 1922	44	108,012	7,818,566	72.39
June, 1921	44	94,729	6,635,553	70.05
Car Building and Repairing				
May, 1922	61	54,258	3,147,377	58.01
June, 1922	61	58,025	3,481,629	60.00
June, 1921	61	44,462	3,057,619	68.77

*Payroll figures are reported as "weekly"; they have been made "half-monthly" by multiplying by 2 1/6.

In referring, on page 1717, June 15, to the una-flow steam engine, it should have been stated that the steam flows from the ends of the cylinder toward a common central exhaust, instead of from the center toward the ends. This uni-directional flow of the steam causes a gradual fall of temperature in the cylinder walls from inlet to exhaust, while the long compression, in combination with jacketing of the heads, raises the temperature of the clearance surfaces to a point above that of the entering steam, thus eliminating cylinder condensation.

A manual on corporation law, accounting and finance, entitled, "Corporation Procedure," is about to be issued by the Ronald Press Co., 20 Vesey Street, New York, under the authorship of Thomas Conyngton, R. J. Bennett, Hugh R. Conyngton and Paul W. Pinkerton. The book is intended to serve as a guide to corporation officials and accountants as well as to lawyers, bankers and investors.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Plates

Sheared, tank quality, base, per lb. .....1.70c. to 1.80c.

Structural Material

Beams, channels, etc. .....1.70c. to 1.80c.

Iron and Steel Bars

Soft steel bars, base, per lb. .....1.70c. to 1.80c.
Refined iron bars, base per lb. .....2.20c.

Hot-Rolled Flats

Hoops, base, per lb. .....2.50c. to 2.75c.
Bands, base, per lb. .....2.50c. to 2.75c.
Strips, base, per lb. .....2.50c. to 2.75c.
Cotton ties, per bundle of 45 lb. $1.10

Cold-Finished Steels

Bars and shafting, base, per lb. .....2.10c.
Strips, base, per lb. .....4.00c.

Wire Products

Nails, base, per keg	$2.40
Bright plain wire, base, per 100 lb.	2.25
Annealed fence wire, base, per 100 lb.	2.25
Galvanized wire, base, per 100 lb.	2.75
Galvanized barbed, base, per 100 lb.	3.05 to 3.15
Galvanized staples, base, per keg	3.05 to 3.15
Painted barbed wire, base, per 100 lb.	2.55 to 2.65
Polished staples, base, per keg	2.55 to 2.65
Cement coated nails, base, per count keg	1.90 to 2.00
Woven fence, carloads	73 per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads, 60, 10 and 10 per cent off list
Machine bolts, small, cut threads....60 and 10 per cent off list
Machine bolts, larger and longer.....60 and 10 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads. 60 and 10 per cent off list
Cut threads .....60 per cent off list
Longer and larger sizes .....60 per cent off list
Lag bolts .....60, 10 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.:
Smaller and shorter.....50 and 10 per cent off list
Larger and longer sizes .....50 and 10 per cent off list
Hot pressed square or hex. blank nuts .....$1.50 off list
Hot pressed nuts, tapped .....$4.50 off list
C.p.c. and t. sq. or hex. nuts, blank .....$4.50 off list
C.p.c. and t. sq. or hex. nuts, tapped .....$4.50 off list
Semi-finished hex. nuts:
9/16 in. and smaller, U. S. S.....80 and 10 per cent off list
⅝ in. and larger, U. S. S...75 and 10 and 10 per cent off list
Small sizes, S. A. E. .....80, 10 and 10 per cent off list
S. A. E. ⅝ in. and larger..75 and 10 and 10 per cent off list
Stove bolts in packages .....80 and 5 per cent off list
Stove bolts in bulk .....80, 5 and 2½ per cent off list
Tire bolts .....65 per cent off list
Track bolts in carloads .....3.00c. to 3.25c. base
Track bolts, less than 200 kegs .....3.50c. to 3.75c. base

Cap and Set Screws

Milled square and hex. head cap screws, 75 and 10 per cent off list
Milled set screws.....75 per cent off list
Upset cap screws .....80 per cent off list
Upset set screws .....80 and 5 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb.....$2.65
Large boiler rivets, base, per 100 lb.....2.75
Small rivets .....70 to 70 and 5 per cent off list

Track Equipment

Spikes, 9/16 in. and larger, base, per 100 lb.	$2.25 to $2.35
Spikes, ½ in. and smaller, base, per 100 lb.	2.50 to 2.60
Spikes, boat and barge, base, per 100 lb.	2.50 to 2.60
Track bolts, base, per 100 lb.	3.25
Tie plates, per 100 lb.	2.00 to 2.25
Angle bars, base, per 100 lb.	2.40

Welded Pipe

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	54½	28	¼ to ⅜	+ 3½	+22½
¼ to ⅜	60	33½	½	36½	18½
½	65	50½	¾	42½	27½
¾	69	56½	1 to 1½	44½	29½
1 to 3	71	58½			

Lap Weld

2	64	51½	2	39½	25½
2½ to 6	68	55½	2½ to 6	42½	29½
7 to 8	65	51½	7 to 12	40½	27½
9 to 12	64	50½			

Butt Weld, extra strong, plain ends

⅛	50½	33	¼ to ⅜	+ 4½	+37½
¼ to ⅜	56	38½	½	35½	23½
½	62	50½	¾	42½	28½
¾	67	55½	1 to 1½	44½	30½
1 to 1½	69	57½			
2 to 3	70	58½			

Lap Weld, extra strong, plain ends

2	62	50½	2	40½	27½
2½ to 4	66	54½	2½ to 4	43½	31½
4½ to 6	65	53½	4½ to 6	42½	30½
7 to 8	61	47½	7 to 8	35½	23½
9 to 12	55	41½	9 to 12	30½	18½

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 and 2½ per cent.

Boiler Tubes

Lap Welded Steel		*Charcoal Iron*	
1¾ in.	26½	1½ in.	5
2 to 2¼ in.	41	1¾ to 1⅞ in.	15
2½ to 3 in.	52	2 to 2¼ in.	25
3¼ to 13 in.	57	2½ to 3 in.	30
		3¼ to 4½ in.	32

To large buyers of steel tubes a supplementary discount of 5 per cent is allowed.

Standard Commercial Seamless Boiler Tubes

Discounts on cold-drawn or hot-rolled tubes in carload lots, f.o.b. Pittsburgh, follow:

1 in.	60	2½ and 2¾ in.	43
1¼ and 1½ in.	52	3 in.	47
1¾ in.	36	3¼ to 4 in.	52
2 and 2¼ in.	39	4¼ in. to 5 in.	44

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Tin Plate

Standard cokes, per base box.....$4.75

Terne Plate

(Per package, 200-lb.)

8-lb. coating	$9.30	25-lb. coating I. C.	$14.25
8-lb. coating I. C.	9.60	30-lb. coating I. C.	15.25
15-lb. coating I. C.	11.80	35-lb. coating I. C.	16.25
20-lb. coating I. C.	13.00	40-lb. coating I. C.	17.25

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb. .....2.40c. to 2.60c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb. .....3.15c. to 4.40c.

Galvanized

No. 28 (base), per lb. .....4.15c. to 4.40c.

Tin-Mill Black Plate

No. 28 (base), per lb. .....3.15c. to 3.40c.

Manufacturers have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic.	$0.325	Buffalo	$0.265	St. Louis	$0.43
Philadelphia, export	0.265	Cleveland	0.215	Kansas City	0.735
Baltimore, domestic	0.315	Cleveland, Youngstown		Kansas City (pipe)	0.705
Baltimore, export	0.255	Comb.	0.19	St. Paul	0.595
New York, domestic	0.34	Detroit	0.295	Omaha	0.735
New York, export	0.285	Cincinnati	0.295	Omaha (pipe)	0.705
Boston, domestic	0.365	Indianapolis	0.31	Denver	1.275
Boston, export	0.285	Chicago	0.34	Denver (pipe)	1.215

Pacific Coast	$1.50	Pacific Coast	$1.50
Pac. Coast, ship plates	1.20	Birmingham	0.69
Memphis	0.385	Jacksonville, all rail	0.50
Jacksonville, rail and water	0.415	New Orleans	0.515

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha, and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 30c. to 40c.; ship plates, 30c. to 40c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 30c. to 40c.; sheets and tin plates, 50c.; rods, wire rope, cable and strands, 75c.; wire fencing, netting and stretcher, 50c.; pipe, not over 8 in. in diameter, 50c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

NON-FERROUS METALS

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
July	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
19.....	14.00	13.75	31.62½	5.75	5.45	6.15	5.80
20.....	14.00	13.75	31.75	5.75	5.42½	6.20	5.85
21.....	14.00	13.75	31.87½	5.75	5.40	6.25	5.90
22.....	14.00	13.75	....	5.75	5.40	6.25	5.90
24.....	14.00	13.75	32.00	5.75	5.40	6.30	5.95
25.....	14.00	13.75	32.12½	5.75	5.40	6.30	5.95

*Refinery quotation.

New York

NEW YORK, July 25.

Copper is quiet, but prices are fairly well sustained. There is very little activity in tin, but prices have shown a slightly upward trend. Lead is quiet, the St. Louis price being slightly easier. A steady demand for zinc, with small stocks available, continues to force prices upward.

Copper.—The copper market is quiet, but prices are fairly steady. Leading producers are unwilling to sell for any position or for delivery to any point at less than 14c., delivered, for electrolytic, but copper held by second hands has been sold at a fraction under this price, but apparently nothing less than 13.87½c., delivered, has been done. The coal and railroad strikes are having at least a sentimental effect upon buying, although so far no actual distress due to coal shortage is reported from plants of the principal copper consumers. The leading copper producers believe that the market is now in fairly strong position, surplus stocks having practically been exhausted, and that larger buying and higher prices will follow the settlement of the coal and railroad labor troubles.

Tin.—There has been just enough business in tin during the past week to establish price levels. Buyers appear to be well supplied for the present and the trade expects present quiet conditions to prevail until the end of the coal and railroad strikes. Most of the large consumers are covered for the next 60 days. Nevertheless the market is firm and prices, as established by sales, have shown a slightly upward tendency during the week, sales to-day having been made at ⅝c. above the price of Tuesday, July 18. Sales during the week have amounted to a few hundred tons only, being mostly for September-October shipment to arrive here in November and December. It was reported but not confirmed that sales at 32c. per lb. for future shipment had been made. To-day's London cables report spot standard quoted there at £158 5s.; future standard at £158 7s. 6d.; spot Straits, £159 5s., while the Singapore price is £160 10s.

Lead.—There is some pressure to sell and fairly substantial lots have been disposed of, mostly by one company, at slightly easier prices at St. Louis, although the New York price has remained unchanged at 5.75c. per lb. The St. Louis sales were made, it is stated, at as low as 5.37½c. per lb. Business is spotty.

Zinc.—Declining stocks and a fairly well-sustained demand are the factors influencing an upward trend in zinc prices. The minimum now appears to be 5.95c., St. Louis, while a few sales are said to have been made at 6c., St. Louis. Production is not increasing and probably will not until the coal and railroad strikes are out of the way, and it is expected that this month will bring about a still further reduction in available stocks.

Antimony.—High prices are being asked for antimony, holders now quoting 5.25c. per lb. for carload lots, duty paid, New York. The market continues to be influenced by prospective tariff legislation.

Aluminum.—The price of the Aluminum Co. of America is unchanged at 19.10c. per lb., f.o.b. cars at producer's plant, freight allowed, for the 98-99 per cent virgin metal. Imported aluminum in the outside market is being offered at 17.75c. to 18c. for the same grade.

Old Metals.—The market during the past week was inclined to be sluggish, but values generally showed little change. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	13.50
Copper, heavy and wire	12.75
Copper, light and bottoms	11.00
Heavy machine composition	10.50
Brass, heavy	8.00
Brass, light	6.50
No. 1 red brass or composition turnings	8.75
No. 1 yellow rod brass turnings	7.50
Lead, heavy	4.875
Lead, tea	3.75
Zinc	3.50

Chicago

JULY 25.—Lead has declined slightly, but good advances have been recorded in tin and spelter prices. The advance in tin seems to be largely in sympathy with the London market, through which considerable business recently is reported to have passed. There is a large inquiry for spelter and although the year began with reserve stocks of considerable proportions the report now is that supplies are meager. Copper is unchanged and old metals prices also are holding at the levels of a week ago. We quote, in carload lots, lake copper 14.12½c.; tin, 30.33½c.; lead, 5.45c.; spelter, 6c,; antimony, 7c.; in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 10.75c.; copper bottoms, 9c.; red brass, 8.50c.; yellow brass, 6.75c.; lead pipe, 4.25c.; zinc, 2.75c.; pewter, No. 1, 20c.; tin foil, 22.50c.; block tin, 26c., all buying prices for less than carload lots.

St. Louis

July 25.—The lead market for the week was a little easier, 5.35c. to 5.40c., carlots, against 5.45c. last week, while slab zinc was firmer at 5.80c. to 5.90c. On old metals we quote light brass 3.50c.; heavy red brass and light copper, 7c.; heavy yellow brass, 4c.; heavy copper and copper wire, 7.50c.; zinc, 2c.; lead, 3c.; pewter, 15c.; tin foil, 16c.; tea lead, 2c., and aluminum 9c.

Plant Operations in the Youngstown District

YOUNGSTOWN, Ohio, July 25.—Industrial coal consumers say that coal prices are prohibitive, and there is no use to buy, as shipments cannot get through.

District plants of the Carnegie Steel Co. at Youngstown and McDonald are maintaining operations. Five of six furnaces are in blast at the Ohio Works, 14 open hearth furnaces are melting, the Bessemer converter is blowing, while bar mill capacity is engaged at about 80 per cent.

The Youngstown Sheet & Tube Co. reports that it is operating four blast furnaces in its East Youngstown group, 11 open-hearth furnaces, Bessemer department, two blooming mills, four skelp mills, one bar mill, 10 tube and 13 to 14 sheet mills, with rod, wire and conduit capacity active.

At its Youngstown plant, the Republic Iron & Steel Co. has one furnace in blast, 11 open hearths charged, two skelp, one bar, one plate, five tube mills and 16 sheet mills. The output of its plate mill is devoted to skelp.

The Brier Hill Steel Co. has two blast furnaces active, 11 open hearths, blooming and bar mills, 84-in. plate mill and 28 sheet mills scheduled.

Schedules of the Trumbull Steel Co. call for the operation of all seven units in its open-hearth department, bar rolling equipment, three strip mills and 44 sheet and tin plate mills at its Trumbull and Liberty plants.

The Sharon Steel Hoop Co. has one blast furnace pouring, six open hearths charged, and it is operating six sheet mills and four strip mills.

Shortage of sheet bars has not yet curtailed production by non-integrated sheet producers, such as the Newton Steel Co., Falcon Steel Co. and the Mahoning Valley Steel Co., which are operating close to a normal basis.

Proposed Steel Mergers Are Not Illegal

(*Continued from page* 210)

observed that the Bethlehem specializes in the production of structural shapes.

Rails — Standard: The Lackawanna's great specialty is the production of steel rails. Of the entire tonnage produced in the United States in 1920 (2,604,116), it contributed 15.18 per cent; the Bethlehem, 6.78 per cent. If these companies combine they will, if the ratio just mentioned continues, control substantially 22 per cent of the country's entire production. About seven-eighths of this production is sold in the United States, the remaining one-eighth being sold in the foreign trade. Of the entire amount sold by these two companies in the New England district, the Bethlehem contributed 16.37 per cent; the Lackawanna 83.63 per cent. In the Eastern district, the Bethlehem contributed 38.69 per cent; the Lackawanna 61.31 per cent. In the Western district, the Bethlehem contributed 4.73 per cent; the Lackawanna, 95.27 per cent. In the Southern district the Bethlehem contributed 67.08 per cent; the Lackawanna, 32.92 per cent. Neither company shipped any into the Pacific Coast district.

My investigation of this matter, conducted by representatives in the field, convinces me that in the New England district these two companies enjoy a very substantial amount of the trade in rails. As already indicated, no figures are available showing what other manufacturers ship there. But representatives of practically every railroad in this district were interviewed, all of whom corroborate the statement just made. This in a great measure, if not entirely, is attributable to the fact that the Lackawanna's plant at Buffalo and the Bethlehem's plant in eastern Pennsylvania lie closest to that field.

With respect to rails a marked uniformity, of long duration, exists in quoting prices. All manufacturers of steel rails throughout the country, no matter where the plants may be located, quote substantially the same prices; and the prices thus quoted are uniformly f.o.b. at the mills. Naturally, therefore, it is the railroad's advantage to place its orders with those mills reached by its own rails; or if no mills are located on its line then with those mills off its line that afford the shortest haul. In the former case it incurs no transportation charge; in the latter, such charges are reduced to a minimum. None of the railroad representatives in the New England district (where alone the Bethlehem and Lackawanna enjoy almost an exclusive field in the rail line), voiced any apprehension that a merger of these companies would result in an enhancement of prices or a monopolistic control.

Rails — Light Tees: These constitute a comparatively unimportant item. In 1920 the Bethlehem produced in the domestic trade 2191 tons; the Lackawanna, 14,416 tons. Only 14 tons were sold by both companies in the New England district. Of the 2191 tons shipped by the Bethlehem 1550 were sold in Pennsylvania and 484 in West Virginia, leaving only 157 tons for distribution elsewhere. The Lackawanna, on the other hand, disposed in Pennsylvania, New York and Ohio of nearly all it produced.

Rail accessories:

(a) Standard splice bars: In the New England district the Bethlehem sold 2701 tons; the Lackawanna, 711 tons. In the Eastern district the Bethlehem sold 8389 tons; the Lackawanna 10,975 tons. Of the latter tonnage the Lackawanna marketed over two-thirds in the State of New York. In the Western district the Bethlehem marketed 1554 tons; the Lackawanna, 3066 tons. In the Southern district the Bethlehem marketed 2405 tons; the Lackawanna, 95 tons. In the Pacific Coast district the Bethlehem marketed 29 tons; the Lackawanna, less than a ton.

(b) Bonzano joints: This is a patented product. The Bethlehem produced 3825 tons; the Lackawanna, 510 tons; both companies selling to a single purchaser.

(c) Continuous and 100 per cent joints: This also is a patented product sold by both companies to a single purchaser, the Bethlehem selling 21,643 tons; the Lackawanna, 4320.

(d) Tie plates—standard: The Bethlehem sold direct to customers 3633 tons; the Lackawanna, 1370 tons, all of which went to a single concern.

These rail accessories constituted but 2.34 per cent of the Bethlehem's domestic business in its steel works division; and but 2.67 per cent of the Lackawanna's domestic business.

Railroad spikes and track bolts: In the New England district the Bethlehem sold 833 tons; the Lackawanna, 544 tons. In the Eastern district the Bethlehem sold 5602 tons; the Lackawanna, 4626 tons. In the Western district the ratio between the two was about the same, although the volume of sales was considerably less. In the Southern district the Bethlehem sold 4570 tons; the Lackawanna, only 591. The sales in the Pacific Coast district were so small as to deserve no mention.

Bridges, Viaducts, Caissons and Buildings.

No figures are available showing the entire amount of business done throughout the country in this line of activity; and it was not until the beginning of this year that the Lackawanna entered upon the construction of viaducts and bridges. It has had nothing to do with caisson construction for upward of three years, although just now it is engaged in carrying out a contract for the tunneling of the Hudson River. With respect to viaducts and bridges the Lackawanna is not equipped to carry on work of the larger kind, its main work being confined to railroad bridges and the like. On the other hand, the Bethlehem's equipment is such as to enable it to construct viaducts and bridges of whatever size. It makes no active effort, however, to acquire the smaller business, such as the Lackawanna engages in, for on the whole it finds it advantageous to keep away as much as possible from work of the smaller kind.

The principal concerns engaged in the fabrication of structural material on a large scale are the following, although there is a large number of smaller fabricators not included in this list whose combined capacity is very substantial:

American Bridge Co., a subsidiary of U. S. Steel Corporation; Belmont Iron Works; Berlin Construction Co.; Bethlehem Fabricators, Inc.; Boston Bridge Works; Buffalo Structural Steel Co.; Eastern Bridge & Structural Co.; Erie Steel Construction Co.; Fort Pitt Bridge Co.; Hay Foundry & Iron Works; Hedden Iron Construction Co.; Jones & Laughlin Steel Co.; George A. Jast Co.; Kansas City Structural Co.; Kellogg Structural Steel Co.; King Bridge Co.; Lehigh Structural Steel Co.; Levgar Structural Co.; McClintic-Marshall Co.; Minneapolis Steel & Machinery Co.; Mt. Vernon Bridge Co.; National Bridge Works; New England Structural Co.; Paterson Bridge Co.; Penn Bridge Co.; Phoenix Iron Co.; Pittsburgh Des Moines Co.; Shoemaker Satterthwaite Co.; Virginia Bridge & Iron Co.; Witherow Steel Co.

The percentage of the principal products produced by other manufacturers and the competition that will exist if this merger goes through.

Pig iron: The total production in the United States in 1920 was 36,925,987 tons, of which the Bethlehem and the Lackawanna together contributed 7.56 per cent. The amount produced by others was 34,137,290 tons, or 92.44 per cent.

Structural Shapes: The entire production in the United States for 1920 was 3,306,748 tons. Of this tonnage, Bethlehem and Lackawanna together contributed 21.43 per cent. Or, to state the matter in a different way, 2,757,929 tons, or 78.57 per cent of the whole, were produced by other concerns. The Iron and Steel Works Directory of the United States and Canada for 1920 gives, on page 470, a list of 52 different concerns engaged in the manufacture of structural shapes in the United States.

Plates: 4,755,133 tons were produced in the United States in 1920; the Bethlehem and the Lackawanna together contributed 4.73 per cent. This means that 4,529,986 tons, representing 95.27 per cent of the total, were produced by other concerns. See pp. 472-3 of the Directory just mentioned for a list of 58 concerns in the United States manufacturing plates in 1920.

Rails: The total production in the United States in

1920 amounted to 2,604,116 tons, of which Bethlehem and Lackawanna together contributed 21.96 per cent. Or, to state the matter in a different way, 2,032,231 tons, representing 78.04 per cent of the total, were produced by others. See p. 469 of the Directory for a list of the various concerns in the United States engaged in the manufacture of rails.

Steel Ingots: Inasmuch as all steel products are made from this article, it will be well to give figures showing the ingot capacity of the entire country and the percentage represented by Bethlehem and Lackawanna, with figures designed to contrast their capacity with that of the United States Steel Corporation and other producers. The country's total rated annual ingot capacity is 50,440,000 tons. Of this amount Bethlehem and Lackawanna's combined capacity is 9.7 per cent; that of the United States Steel Corporation is 45 per cent; that of all others is 45.3 per cent. In other words, the rated ingot capacity of the United States Steel Corporation is about five times that of the Bethlehem and Lackawanna combined.

Will a merger of these companies violate the act of July 2, 1890, commonly known as the anti-trust act?

In my opinion it will not. I am unable to find any ground for asserting that the acquisition of the Lackawanna by the Bethlehem will offend the Act of July 2, 1890, commonly known as the Sherman or anti-trust act. The numerous decisions of the supreme Court, ranging over a period of 30 years, leave little room for doubt as to the true scope and meaning of this important statute. Every combination formed for the avowed purpose of restraining interstate trade or of acquiring a monopoly therein falls, of course, within its condemnation. As pointed out in an early decision of the Supreme Court,[1] it is not every contract or combination in restraint of trade that is prohibited by this act; for if that were the case, scarcely any contract would fall beyond its reach. It obviously applies, however, to every contract or combination in unreasonable restraint of trade; and manifestly the evils that may be inflicted upon the public, such as the enhancement of prices, are of paramount concern.

I am unable, however, to find in the exhaustive investigation I have made any reasonable warrant for asserting that the public will suffer if this consolidation is consummated. I am persuaded that the motive which prompts the Bethlehem to acquire the Lackawanna plant is the sole desire to secure greater efficiency and economy in the production, handling, and distribution of steel products, and that the thought of acquiring a monopoly or of enhancing prices was never present. The whole transaction from beginning to end impresses me as being thoroughly clean, honest and straightforward. I need not stop to point out that in *United States* v. *U. S. Steel Corporation*, 251 U. S. 417, the Supreme Court refused to declare illegal a combination of much greater magnitude. In that case the court apparently adopted the findings of two of the four judges of the lower court that the combination there assailed was formed for the avowed purpose of acquiring a monopoly; but because monopoly was found to be impossible of attainment and all attempts with other manufacturers to control prices had been abandoned in good faith before suit was brought, the court refused to order the combination dissolved. The merger now under consideration will be neither an actual monopoly nor even an attempt to monopolize; and of course the decision just referred to is controlling.

Will a merger of these companies violate the Act of October 15, 1914, commonly known as the Clayton Act?

Here also I am constrained to the conclusion that it will not. But different considerations in part apply. That act (Sec. 7) makes it illegal for one corporation engaged in interstate commerce to acquire the *stock or other share capital* of another corporation engaged also in such commerce where the effect of such acquisition may be substantially to lessen competition between them or to restrain commerce in any section or community, or tend to create a monopoly of any line of commerce. It is obvious that the acquisition of the stock of one company by another is not prohibited where all that takes place is a mere lessening of competition. The act denounces the acquisition only where the effect may be *substantially* to lessen competition between the companies. I have set forth with considerable detail the extent of the competition existing between the two companies mentioned. In my opinion the facts are not such as to bring the proposed merger within the prohibition of the Clayton act.

This conclusion renders it unnecessary for me to consider another question, the solution of which is attended with no little difficulty, and that is whether the proposed merger would fall within this act if its effect were to substantially lessen competition. As we have just seen, that act does not in express terms prohibit the acquisition of physical assets. What it prohibits is the acquisition of "the stock or other share capital." What the Bethlehem company in this instance proposes to do is to acquire, not the capital stock of the Lackawanna, but an outright conveyance of its physical assets. The Federal Trade Commission, by a ruling made in 1916, announced that in its opinion the act did not prohibit the acquisition of the physical assets of one corporation by another. As that body, no less than myself, is charged with the duty of enforcing certain provisions of this act, its administrative construction of the section in question is entitled, under a long and well recognized line of authorities, to great weight. In this instance, however, the plan of purchase contemplates that the Lackawanna shall convey its property to the Bethlehem in return for shares of stock of the latter company, to be followed by an early winding up and dissolution of the Lackawanna and the distribution of these shares among the Lackawanna stockholders. I need not, however, stop to consider whether, under other circumstances, this would be a violation of the act, for the conclusion I have just announced makes it unnecessary to do so.

Will a merger of these companies violate the Act of April 10, 1918, commonly known as the Webb Act?

These companies are members of an association formed pursuant to the authority granted by this act to handle export trade. It is obvious from what I have already said that this act will in no wise be violated if this merger goes through.

Will a merger of these companies violate the act of Sept. 26, 1914, commonly known as the Federal Trade Commission act?

The Senate's resolution is broad enough to call for an expression of my views upon this point; but for obvious reasons I must decline to express any. The Federal Trade Commission is alone vested with the power of enforcing that act, and as appears from the *Congressional Record*, 67th Congress, 2d session, p. 8872 *et seq.*, that body has preferred a formal complaint against these companies, charging that the proposed merger is an unfair method of competition within the meaning of sec. 5. The Senate will no doubt be quick to perceive the impropriety of my expressing any opinion upon this matter.

Midvale-Repubic-Inland Merger

I shall begin by taking up the products common to all three of these companies and present sales figures showing the geographical distribution of the products and the percentage which the production of these companies bears to the entire production in the United States. As in the case of the other merger, I shall deal alone with the year 1920.

Coke and By-Products: The remarks under this heading in dealing with the other merger are likewise applicable here, and accordingly this item does not require separate treatment.

Pig Iron: What has been said under this heading with respect to the other merger likewise applies here.

[1] *Hopkins* v. *United States*, 171 U. S. 578, 600. "The act * * * must have a reasonable construction or else there would scarcely be an agreement or contract among business men that could not be said to have indirectly or remotely some bearing upon interstate commerce, and possibly to restrain it."

and repetition is accordingly unnecessary. The three companies combined produced only a small per cent of the entire production in the United States, and are really not in competition with respect to this item, the Republic alone engaging in its sale and then only with respect to that made in Alabama.

Blooms, Billets and Slabs: In the New England district (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont) none of the three companies in 1920 sold any blooms. Midvale sold 33 tons of billets and 3 tons of slabs. The Republic sold 1055 tons of billets, and no slabs. Inland sold neither blooms, slabs nor billets. In the Eastern district (New York, Delaware, District of Columbia, Maryland, New Jersey, Ohio, Pennsylvania and West Virginia) the Republic sold no blooms. The Midvale sold 10,582 tons, over one-half of which went to New York. The Inland sold 36,451 tons, all but 90 tons going to Ohio and Pennsylvania. As a rule the Inland's shipments into this territory are exceedingly small, the heavier tonnage for 1920 being accounted for by the fact that an unusual shortage occurred in this district in that year, and the abnormal conditions which existed at the time were such as to induce Inland to ship a portion of its product to that territory.

With respect to billets the Midvale sold 953 tons; the Republic 6977 tons; the Inland 12,747, all but 154 tons going to Ohio. With respect to slabs Midvale sold 3015 tons; Republic 1845 tons; Inland 15,021 tons, all of which went to a single concern in northern Ohio.

In the Western district (Colorado, Idaho, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, North Dakota, South Dakota, Utah, Wisconsin and Wyoming) the Midvale sold only 4 tons of blooms, 56 tons of slabs and 2733 tons of billets; the Republic none at all; the Inland 217 tons of blooms and 33,819 tons of billets, of which over 30,000 were sold in Illinois. In the Southern and Pacific Coast districts the sales made by each are so insignificant as to deserve no mention. When we stop to consider that approximately 35,000,000 tons were produced in the United States, we realize how inconsequential this item really is. As stated elsewhere, blooms, billets and slabs are usually used by the steel manufacturer that produces them, the surplus only finding its way to the market and then usually to accommodate some particular manufacturer who happens to be running short.

Sheet Bars: None of the companies sold this product in the New England district. In the Eastern district, Midvale sold 15,792 tons, over one-half of which was sold in Pennsylvania; Republic, 173,533 tons, of which all but 18,759 tons were sold in Ohio; Inland sold 35,300 tons, 22,302 tons going to Ohio and the balance to Pennsylvania. In the Western district, Midvale sold none at all; Republic, 165 tons; Inland, 2928 tons; all but 39 tons being sold in Indiana, where the Republic sold none at all. None of the companies sold in the Southern or Pacific Coast States. It is to be borne in mind that sheet bars are a semi-finished product, the purchaser being the steel manufacturer and not the ultimate consumer. As shown at page 469 of the Iron and Steel Works Directory of the United States and Canada for 1920, there are 37 concerns scattered throughout the United States engaged in the production of this product.

Plates: The entire production in the United States for 1920 was 4,755,133 tons. Midvale contributed 8.22 per cent; Republic 0.75 per cent; Inland 2.31 per cent. In the entire New England and Eastern districts Inland sold only 576 tons; Republic 27,956 tons, 16,215 tons of which were sold in Pennsylvania, 6763 tons in Ohio, and 3153 tons in Maryland. The rest of its sales were scattered through Delaware, New Jersey, New York, Rhode Island and West Virginia. On the other hand, Midvale, whose sales aggregated 269,057 tons, reached every one of the States in these two districts, Pennsylvania, Ohio, New York, Maryland, New Jersey, Massachusetts and Delaware being the heaviest purchasers in the order stated. In the Western States Midvale sold 26,054 tons; Inland 94,850 tons; while Republic sold but 67 tons. In Illinois and Indiana Inland's sales aggregated over 68,000 tons; Midvale's sales in these two States amounting to about 10,000 tons. In the Southern States, Midvale's sales amounted to 18,260; Republic's, 1137; Inland's, 844 tons. In the Pacific Coast States, Midvale's sales amounted to 6004 tons; Inland's to 3544 and Republic's to 26 tons.

After eliminating the plates made by these three companies in 1920, the remaining production in the United States amounted to 4,218,803 tons, or 88.72 per cent of the total. By referring to the Iron and Steel Works Directory of the United States and Canada for 1920 it will be seen (pp. 472-3) that 62 companies are listed as manufacturers of plates, 58 of which are in the United States.

Sheets: Midvale is not a manufacturer of this article and therefore can be disregarded. In the entire New England and Eastern districts Republic sold 32,204 tons; Inland only 1279 tons, all but 214 tons of which went to Ohio, the remaining 214 finding its way either to New York or Pennsylvania. When we come to the Western district, we find the Republic sold 9077 tons, whereas the Inland sold 84,600 tons. Of the 9077 tons sold by the Republic in this territory, over one-half found its way to Illinois, in which State the Inland sold 44,980 tons. In the Southern district the Republic sold 3709 tons; the Inland 5030 tons. In the Pacific Coast district the Republic sold 1704 tons; the Inland 5751 tons.

The total production of sheets in the United States in 1920 was 4,582,547 tons, Inland contributing 2.3 per cent and Republic 1.09 per cent. Or, to state the matter in a different way, 4,427,158 tons, representing 96.61 per cent of the total production, were produced by other companies. On p. 474 of the directory mentioned under the preceding heading will be found a list of 66 companies, all engaged in the manufacture of plates. The American Sheet & Tin Plate Co. alone has 13 mills, located at various points in Ohio, Indiana and Pennsylvania. (See pp. 21-24 of directory just mentioned.) There were 644 sheet mills in the United States on Jan. 1, 1922, the Republic and the Inland together owning 36 of this number.

Structural Shapes: The Republic does not manufacture this important item and therefore may be disregarded. In the entire New England and Eastern districts the Midvale sold 79,032 tons; the Inland 4174 tons. The Midvale reached every State in this territory; the Inland only Connecticut, New York, Ohio and Pennsylvania, nearly all of its product going to the two latter States. In the Western district, the Midvale sold 13,985 tons; the Inland 106,747 tons. In the Southern district, the Midvale sold 5145 tons; the Inland 1560 tons. In the Pacific Coast district, the Midvale sold 3109 tons; the Inland 7746 tons.

The entire production in 1920 in the United States was 3,306,748 tons, of which Midvale contributed 3.61 per cent and the Inland 3.72 per cent. It will be seen from the figures just given that the great bulk of Midvale's tonnage is marketed in the New England and Eastern territory, where Inland finds a market for about one-nineteenth of the tonnage marketed by Midvale. On the other hand, the great bulk of Inland's tonnage is marketed in the Western district, where Midvale markets about one-eighth of the tonnage marketed by the Inland.

After deducting the tonnage manufactured by these two companies in 1920 from the total tonnage throughout the United States, we have left 3,064,323 tons, or 92.67 per cent of the total. By turning to the Iron and Steel Works Directory for 1920, p. 470, we find a list of 52 concerns engaged in the manufacture of structural shapes at different places in the United States.

Rails: Until recently Midvale was the only one of these three companies to manufacture rails. In March, 1922, Inland, however, began their manufacture and sale. It is apparent from the discussion of this item in dealing with the other merger that no competition between the two companies will exist with respect to rails, the plants of each company being close to 800 miles apart.

Merchant Bars: In point of tonnage this is the most important item in the steel industry. To obtain an accurate idea of the sales made by these three com-

panies it will be well to divide merchant bars into three classes: (1) steel bars; (2) old rail bars; (3) iron bars. Iron bars may be disregarded, the Republic being the only one that makes them. Midvale may be disregarded so far as old rail bars are concerned, for it does not make them. And so far as the New England and Eastern districts are concerned Inland may be entirely disregarded with respect to steel and old rail bars, for it sold none of the latter and only 877 tons of the former.

Coming now to steel bars, in the New England and Eastern districts Midvale sold 132,087 tons; Republic 191,712 tons. In the Western district, sales of steel bars were: Midvale, 30,597 tons; Republic, 44,842 tons; Inland, 73,922 tons. In the Southern district, Midvale, 7945 tons; Republic, 4922 tons; Inland, 1009 tons. In the Pacific Coast district, Midvale, 1526 tons; Republic, 152 tons; Inland, 630 tons.

With respect to old rail bars (which Midvale does not produce) the Republic sold 1219 tons in the New England and Eastern districts; the Inland none at all. In the Western district, the sales were: Republic, 34,366 tons; Inland, 35,868 tons; in the Southern district, Republic, 1464 tons; Inland, 671 tons; in the Pacific Coast district, none at all.

In this connection the fact must not be overlooked that "merchant bars" is a generic term of wide application, embracing different kinds of bars which are used for an endless number of purposes. The bars produced by the Midvale are practically all made on slow-running hand mills. On the other hand, about 75 per cent of the bars turned out by the Republic are made on continuous or semi-continuous mills. The larger part of those produced by the Midvale are of a high grade and of special grades and special sections; while those produced by the Republic and Inland are of a commoner sort—styled common merchant bars to distinguish them from the higher grade article. Because of the wide variety of uses to which these bars are put, the demands of the trade must be satisfied by the production of these various types and grades. Unlike those produced by the Midvale, Inland, for example, makes no special sections. Its product, all of which is made from continuous mills, consists for the most part of rounds, squares and flats, and of what is termed concrete bars.

Still using 1920 figures as a basis, of the entire steel tonnage market by Midvale 14.45 per cent was represented by merchant bars; in the case of the Republic 34.37 per cent; and in the case of the Inland 16.83 per cent.

The total production of merchant bars (iron, steel and old rail bars) in the United States in 1920 amounted to 7,268,313 tons. Midvale's contribution was 2.72 per cent; Republic's 4.77 per cent; Inland's 1.75 per cent; or 9.24 per cent for all three. There are 148 different concerns engaged in the production of these bars, 109 of which make steel bars. A complete list of these various manufacturers and the location of their plants will be found at pp. 478-82 of the 1920 directory above mentioned.

Other Products Made by These Companies: It must not, of course, be inferred that the products above enumerated are the only ones made by these companies. On the contrary, numerous other articles are manufactured, many of them on a large scale. For example, Republic is a large manufacturer of oil and gas pipe, which neither Midvale nor Inland produces. Again, Midvale is a large manufacturer of boiler tubes, rods, drawn wire, wire nails, steel cars, axles and wheels, none of which is produced by the other two. But the above enumeration ambraces substantially all of the products of any importance produced in common by these companies.

Will a merger of these companies violate the act of July 2, 1890, commonly known as the anti-trust act?

I see nothing in the proposed merger that offends this act. In my opinion there is not the slightest ground for supposing that it will result in any restraint of trade or monopolistic control. The plants of these companies are widely scattered; and my investigation leads to but one conclusion, and that is that the underlying purpose of this combination is not to acquire a monopoly or to restrain trade, but to enable the new company more effectually to compete with the United States Steel Corporation, which because of the wide distribution of its various plants and their easy accessibility to the source of raw materials, is enabled to produce and sell its products much cheaper than other manufacturers. Instead, therefore, of being in restraint of trade, the new combination will be in furtherance of trade. Its formation has, I believe, been in a great measure prompted by the heavy losses which all of these companies sustained following the marked depression in the steel industry which began over a year ago. These losses, aggregating many millions of dollars, have naturally induced these companies to devise methods of cheapening the production, sale and distribution of their products. By owning plants that are widely scattered, where production can take place in accordance with the needs of the community lying closest to the plants; by manufacturing products at plants advantageously located to ore supplies; by reducing overhead expenses; and by eliminating unnecessary sales agencies, substantial economies can be effected. The combination being formed for this sole purpose, I am unable to see wherein it is tainted with illegality.

Will a merger of these companies violate the Act of Oct. 15, 1914, commonly known as the Clayton act?

What these companies plan to do is to merge the Inland with the Midvale and to acquire outright the physical assets of the Republic. To accomplish this shares of the stock of the new company will be issued to the stockholders of the old companies in exchange for their present holdings, accompanied in the case of the Inland by a payment of something like $24,000,000 to retire its preferred stock.

In the light of the facts which I have set forth, I fail to descover any ground for asserting that the Clayton Act will be violated.

Will a merger of these companies violate the act of April 10, 1918, commonly known as the Webb act?

As in the case of the other merger, these companies, too, belong to an association formed to handle export trade alone and functioning under the permission which this act gives. In my opinion it is impossible to conceive how a merger of these companies will in any way offend this act.

Will a merger of these companies violate the act of Sept. 26, 1914, commonly known as the Federal Trade Commission act?

Under a like heading in dealing with the other merger I have pointed out the impropriety of my expressing any opinion upon this question. For exactly the same reasons I must pursue a similar course here.

Very respectfully,

H. M. DAUGHERTY,
Attorney General.

HON. CALVIN COOLIDGE,
President of the Senate.

July 21, 1922.

The first regional meeting of the American Society of Mechanical Engineers will be held at Springfield, Mass., Sept. 25, 26 and 27, under the auspices of the Engineering Society of Western Massachusetts. It is planned to make the program broad in scope and interest and thus to provide a meeting calculated to attract membership from a large section of New England and New York State, particularly the eastern section of the latter.

The Walworth Mfg. Co., valves, fittings, etc., has advanced wages six to ten per cent to apply to 1200 workers at the company's South Boston plant, thereby restoring a cut made May 30, which, according to Howard Coonley, president, was not justified by conditions that have obtained since. He states the cost of living has not declined as much as anticipated.

FABRICATED STEEL BUSINESS

Bridge and Building Awards and Tonnages Pending at Leading Centers

Awards for fabricated steel work for the past week include the following:

Power plant for Brooklyn Edison Co., Brooklyn, N. Y., 8000 tons, to McClintic-Marshall Co.

New York Telephone Co., exchange, New York, 1800 tons, Levering & Garrigues Co.

Public schools Nos. 19 and 69, New York, totaling 650 tons, to Bethlehem Fabricators, Inc.

State Hospital, Trenton, N. J., 200 tons, to American Bridge Co.

Shops for Erie Railroad, Hornell, N. Y., 937 tons, to American Bridge Co.

Tribune Building, Oakland, Cal., 650 tons, to Dyer Brothers.

Central Ferry Bridge, Snake River, Whitman and Garfield counties, Washington, 956 tons, to Penn Bridge Co.

Kansas City Southern Railway Bridge over Arkansas River, Redlands, Okla., 1900 tons, to McClintic-Marshall Co.

Northwestern States Portland Cement Co., building, 194 tons, to Indiana Bridge Co.

Building for Nash Motors Co., Kenosha, Mich., 1000 tons, to H. K. Ferguson Co., steel to be furnished by McClintic-Marshall Co.

Dam No. 44, Ohio River, 620 tons: Lock A, to the American Car & Foundry Co.; Lock B, to the Charles Hegewald Co.; Lock C, to the Penn Bridge Co.; Lock D, to the American Bridge Co.

Commercial building for Zingen & Braun, Sixth and Sycamore streets, Milwaukee, 125 tons, to Milwaukee Structural Steel Co.

Missouri, Kansas & Texas Railroad, shops at Dennison, Tex., 350 tons, to Mississippi Valley Structural Steel Co.

Gas holder at Framingham, Mass., 500 tons, to Stacey Mfg. Co., Cincinnati.

West Technical High School, Cleveland, 500 tons to the American Bridge Co.

Structural Projects Pending

Inquiries for fabricated steel work which may be added to lists of pending projects include the following:

First Church of Christ Scientist, New York, 500 tons.

Young Men's Hebrew Association, Newark, N. J., 1000 tons.

Sinclair Consolidated Oil Corporation, 25 oil tanks for Wyoming field, 7000 tons.

Loft building on Thirty-third Street, New York, 300 tons.

Locust Street Office Building, Philadelphia, 400 tons.

Chamber of Commerce Building, Newark, N. J., 400 tons.

New Nebraska Capitol, 2100 tons, bids being taken.

Apartment building, Chicago, Howard Shaw, architect, Chicago, 700 tons.

Riverside pumping station, Milwaukee, 438 tons, bids close July 27, R. E. Stoelting, commissioner of public works.

Bascule bridge for Florida State Highways at Pensacola, 100 tons, bids being taken.

Jewish Temple, Cleveland, 500 tons, bids to be taken Aug. 14.

Bradford-Carrollton bridge, Cattaraugus County, New York, 500 tons, bids taken.

Court House addition, Akron, Ohio, 500 tons, all bids rejected and to be re-advertised.

Office building at Chestnut and Fifteenth Streets, Philadelphia, for Albert M. Greenfield, 2500 tons.

Railroad Equipment Business

Locomotive orders have been heavy lately, reported awards reaching an aggregate of more than 100. The Illinois Central Railroad has bought 65, the Delaware, Lackawanna & Western 30, and the Southern Railway 6. Evidently anticipating future demands for Mikados, the American Locomotive Co. is asking bids on supplies for 25 to 50 engines of that type. There is a good number of new cars in the business of the past week, the outstanding one being of 3000 composite gondolas distributed among five builders by the Illinois Central Railroad. It is estimated that about 40,000 tons of steel will be required for this and an order from the Reading for 1000 gondolas. Car repair business is heavy; much has been placed but more still is to be let.

Of the 1000 70-ton steel gondolas for the Philadelphia & Reading, 500 will be built by the Pressed Steel Car Co. and 500 by the Standard Steel Car Co.

The 3000 composite gondolas for the Illinois Central have been divided as follows: Pullman Co., 1000; American Car & Foundry Co., 500; Bettendorf Co., 500; Mount Vernon Car Mfg. Co., 500; Western Steel Car & Foundry Co., 500.

The Pittsburgh & West Virginia has ordered 1000 55-ton steel hopper cars from the Cambria Steel Co.

The Baltimore & Ohio has placed 500 box cars for repairs with the Streator Car Co., Streator, Ill., and is asking bids for the repair of 750 additional.

The Chicago, Milwaukee & St. Paul Railroad soon will distribute repair work on 250 gondolas, 500 box cars requiring new steel underframes and heavy repairs and 1250 wooden gondolas.

The Rock Island System will put out for repairs 500 National dump cars, 500 refrigerator cars, 500 automobile and furniture cars and 1500 box cars.

The Chicago, Burlington & Quincy Railroad, which recently placed 500 new box cars with the Streator Car Co., will put out for repairs 500 all-steel gondolas and from 500 to 1000 box cars.

The Chicago & North Western Railroad will put out 1000 or more box cars for repairs.

The Erie Railroad is asking bids on heavy running repairs to an indefinite number of box cars.

The Metropolitan Elevated Railroad has awarded 100 new cars to the Cincinnati Car Co.

The Illinois Central Railroad also has placed 65 new locomotives, 25 Mikados with the American Locomotive Co., 25 central type with the Lima Locomotive Co., and 15 switch locomotives with the Baldwin Locomotive Works.

The American Locomotive is in the market for supplies for 25 to 50 Mikados for stock.

The Delaware, Lackawanna & Western Railroad has placed 5 fast freight Pacific and 25 Mikados with the American Locomotive Co.

The Southern Railway has ordered 6 eight-wheel switch engines from the Baldwin Locomotive Works.

NEW OTIS STEEL PLANT

Cleveland Company Will Roll Sheet Bars and Slabs for Its Mills

The Otis Steel Co., Cleveland, is understood to have about completed financial plans for the erection of a steel plant to supply the sheet bar and slab requirements of its plate and sheet mills. An inquiry for buildings for the plant is now in the hands of fabricators. There will be seven open-hearth furnaces and the necessary rolling equipment.

The New York Stock Exchange recently received notice of a proposed increase in the common stock of the Otis Steel Co. from 500,000 to 1,000,000 shares.

The notice, while stating that a special meeting of stockholders will be held on Sept. 15 at Cleveland for the purpose of authorizing the increase in the common stock, gave no details as to the purpose of doubling the amount of outstanding common shares.

The company has a small amount of unissued common stock in the treasury. Under the laws of the State of Ohio a corporation cannot increase the authorized amount of stock so long as it has some stock unissued. In this case the unissued stock is small and the company desired to increase the authorized amount of its common stock considerably. In order to do this a special meeting of stockholders was called to reduce its authorized common stock to the amount now outstanding. That having been done, the company will be in position to have the stockholders vote on the proposition to increase the authorized amount of its common stock from 500,000 shares to 1,000,000 shares.

The California Equipment & Supply Co., 205 North Los Angeles Street, Los Angeles, Cal., is in the market for a steel building 50 to 60 ft. wide and about 240 ft. long, second-hand, and a used 20-ton overhead traveling crane. The company is also inquiring for a tonnage of 8-lb., 12-lb. and 16-lb. rails, new or used, and some ½-in. to 6-in. black and galvanized pipe, second-hand.

British Iron and Steel Market

More American Pig Iron Purchases—British Loan to Skoda Works—India Buying on Continent

(*By Cable*)

LONDON, ENGLAND, July 25.

In pig iron there are further American and Canadian inquiries for Cleveland and Scotch foundry grades. Some Scotch foundry has been sold for Atlantic ports and for prompt shipment. Home buying is practically stagnant and prices are tending downward. Present supplies are sufficient to meet demand.

Foreign ore is idle.

Steel prices generally are unaltered with small business passing. Some Scottish works have reopened, others remaining idle for all of July.

A British group is reported negotiating a loan of £1,500,000 to the Skoda Works.

Continental sales are moderate. India is the chief buyer. Belgian merchant bars have sold at £8 2s., c.i.f. Bombay. German 14 to 20-lb. rails are quoted at £7 10s., f.o.b..

Tinplates show a weaker tendency on lack of a substantial demand. On prompt business 19s. 7½d. is quoted per base box, f.o.b. Export in tinplate is quiet. The home trade is buying moderately. Odd sizes go at 19s. 3d., f.o.t. August delivery. There is a fair demand for wasters, buyers paying for 28 x 20-in. plates 38s. 6d., f.o.t.

Galvanized sheets are firmer, but demand has not been stimulated. South America bought small lots. Japanese specifications black sheets sold at £15 f.o.b.

We quote per gross ton, except where otherwise stated, f.o.b. maker's works, with American equivalent figured at $4.46 per £1, as follows:

Durham coke, delivered	£1	6/9				$5.95	
Cleveland No. 1 foundry	4	15				21.18	
Cleveland No. 3 foundry	4	8	&	4	8*	19.62	
Cleveland No. 4 foundry	4	7½				19.52	
Cleveland No. 4 forge	4	5				18.96	
Cleveland basic	4	0	&	4	0*	17.84	
East Coast mixed	4	11	&	4	11*	20.29	
Ferromanganese	15	0				66.90	
Ferromanganese*	14	10	to	14	15	64.67 to	$65.78
Rails, 60 lb. and up	7	17½	to	9	10	35.12 to	42.37
Billets	7	0	to	8	0	31.22 to	35.68
Sheet and tin plate bars, Welsh	7	7½				32.89	
Tin plates, base box	0	19/6	to	0	19/7½	4.35 to	4.38
						C. per Lb.	
Ship plates	9	0	to	10	0	1.79 to	1.99
Boiler plates	13	0	to	14	0	2.59 to	2.79
Tees	9	5	to	10	10	1.84 to	2.09
Channels	8	10	to	9	15	1.69 to	1.94
Beams	8	5	to	10	0	1.64 to	1.99
Round bars, ¾ to 3 in.	9	5	to	10	10	1.84 to	2.09
Galvanized sheets, 24 g.	16	0	to	16	10	3.18 to	3.28
Black sheets	12	0				2.39	
Steel hoops	12	0	&	12	5*	2.39 &	2.44*
Cold rolled steel strip, 20 g.	23	2½				4.60	
Cotton ties, Indian specifications	15	0				2.99	

*Export price.

Continental Prices, All F.O.B. Channel Ports, Delivery as Specified

No. 3 foundry pig iron:							
Belgium, August	£4	2½	s. to £4		5s.	$18.40 to	$18.95
Luxemburg, August	4	0	to	4	5	17.84 to	18.95
France, August	4	2½	to	4	5	18.40 to	18.95
Basic pig iron:							
Luxemburg							
Billets:							
France	5	15				25.65	
Luxemburg, July	6	5				27.75	
Lorraine, July	6	5				27.75	
Wire nails (keg basis):							
Germany, August	0	14½				3.22	
Belgium, July	0	20½				4.55	
Wire rods, 5 mm. (0.2 in.):							
Belgium, July	7	5	to	10	7½	32.19 to	46.06
Angles:							
Belgium, September	7	7½				1.47	
Tees:							
Belgium, July	8	5				1.64	
Merchant bars:							
Belgium, October	7	7½	to	7	15	1.47 to	1.54
Luxemb'g, October	7	12½	to	7	15	1.52 to	1.54
Germany, October	7	15	to	7	17½	1.54 to	1.56
France, October	7	17½	to	8	0	1.57 to	1.60
Channels:							
Belgium, July	7	10	to	7	12½	1.49 to	1.51
Joists (beams):							
France, Sept.	7	15				1.54	
Belgium, Oct.	7	5				1.44	
Luxemburg, Sept.	7	2½	to	7	5	1.42 to	1.44
⅜-in. plates:							
Germany, Aug., Sept.	7	15	to	8	5	1.54 to	1.64
Belgium, Aug., Sept.	7	15	to	7	17½	1.54 to	1.56
Luxemburg and France, not offered.							
⅛-in. plates:							
Germany	9	0				1.78	
No. 8 gage wire:							
Belgium, July, Aug.	14	10/7½				2.87	

Favorable and Unfavorable Influences Affecting British Business

(*By Mail*)

LONDON, ENGLAND, July 13.—Although business generally here is far from active, markets on the whole show a wonderfully confident tone in the face of the many disquieting political and economic problems, such as the threatened breakdown of the Hague conference and the catastrophic fall of the German mark. Certain features assist in stimulating hopefulness. One of these is the cheap rate for money and another the more reasonable attitude of labor, and a third the prospect of a reduction in railroad freight rates commencing at the beginning of next month.

Business with the iron and steel industry generally is restricted, but this is apparently attributable to the succession of holiday periods in various parts of the country. So far as pig iron is concerned, the quantities going into home consumption are not very important, but a fairly brisk export trade has been done and about a week ago a cargo of 1000 tons of special foundry iron was dispatched to the United States, while negotiations for further quantities of ordinary standard quality are proceeding.

So far as manufactured materials are concerned some orders for structural steel have been placed by Indian railroads, as well as for rails, and some of the rail makers are fairly busy. On the whole, however, the trade in manufactured iron and steel is not expanding very rapidly. The prices of Continental material are, of course, unsettled on account of the abnormal condition of the foreign exchanges, and at the moment there does not seem to be much business passing in this class of material.

It is reported that the Imperial Government Railways in Japan have ordered 34 complete electric locomotives from the English Electrical Co., Ltd. This company has five large works, three of which are in the Birmingham neighborhood. Meanwhile the Leeds Forge Co. has dispatched the first of 40 all-steel railroad coaches for the trans-European passenger service.

A matter of some interest is the issue of £2,000,000 7 per cent first mortgage debenture stock on behalf of the Tata Iron & Steel Co. The company has long term contracts for the supply of pig iron to Japan and steel rails to many of the Indian railroads.

A galvanizing unit is being added to the equipment of the Dominion Sheet Metal Corporation, Ltd., Hamilton, Canada. This is estimated to give a total capacity for galvanizing sheets of 22,500 tons per annum. The company reports full operations since March 1 and the outlook as good in view of a highly favorable Canadian crop situation.

The Hymen-Michaels Co., Chicago, recently bought from the Union Pacific Railroad 25,000 tons of 75-lb. to 85-lb. relaying rails, and in the past five or six weeks, including the Union Pacific purchase, has secured a total of 60,000 tons of these rails in various parts of the country.

STEEL STOCKS STRONG

Unfavorable Developments in Coal and Railroad Status Not Depressing

The stock market was remarkably strong last week, in view of the failure of Allan A. Ryan, and the unfavorable developments in the coal and railroad stocks. Steel stocks, for the most part, made gains. That for the week for the United States Steel Common was 1.75 points and ⅛ on preferred, while the Republic Iron & Steel Co. and the Midvale Steel Co. made fractional gains. The market early this week was not so strong as last week.

Steel mill shares made a relatively better showing than industrial securities during the past week. Earnings statements recently issued by independent steel companies are encouraging inasmuch as they show net profits, whereas six months and a year ago deficits were in order. Not in all cases, however, have earnings suggested an early resumption of dividends by these corporations.

The range of prices on active iron and industrial stocks from Monday of last week to Monday of this week was as follows:

Allis-Chalmers	53⅞- 56	Lima Loco. pf...	-110
Allis-Chal. pf	98¼- 98½	Midvale Steel	34½- 38
Am. B. S. & F.	61 - 63½	Nat.-Acme	17 - 18
Am. Can	55 - 58	Nat. En. & Stm.	53¾- 56¼
Am. Car & Fdry.	166 -169¾	N. Y. Air Brake	78½- 82
Am. Car. & F. pf.	-121	Nova Scotia Steel	- 31½
Am. Loco.	114½-118½	Otis Steel	11¼- 12⅞
Am. Loco. pf.	-117½	Pitts. Steel pf.	- 96¾
Am. Rad. pf.	-116	Pressed Steel	79 - 82¼
Am. Stl. Fdries.	36¾- 38½	Ry. Steel Spring.	104 -109
Am. Stl. F. pf.	99½- 99⅝	Ry. Steel Spg. pf	-112½
Bald. Loco.	118 -121½	Replogle Steel	31½- 35
Beth. Steel	74¾- 76	Republic	71 - 76½
Beth. Steel Cl. B	76 - 79⅞	Republic pf	92½- 93½
Beth Stl. 8% pf.	-114	Sloss	47½- 49¼
Br. E. Stl. 1st pf	- 73⅛	Steel of Canada	73½- 75
Br. E. Stl. 2d pf	30¾- 31	Superior Steel	32½- 33½
Chic. Pneu. Tool	67½- 71½	Trans.-Williams	- 39
Colo. Fuel	30 - 32	Un. Alloy Steel	39 - 40⅝
Cruc. Steel	76½- 88⅜	U. S. Pipe	32⅝- 35⅝
Cruc. Steel pf.	90½- 93	U. S. Pipe pf.	- 67
Gen. Electric	171 -178¼	U. S. Steel	99½-102½
Gt. No. Ore Cert.	39⅝- 40⅞	U. S. Steel pf.	120¾-120⅞
Gulf States Steel	81½- 86⅞	Vanadium Steel	46½- 50¾
Inland Steel	50¾- 52	Va. I. C. & C.	50 - 51
Int. Har.	100½-105¼	W'house Air Br.	92 - 93
Lack. Steel	75½- 79	W'house E. & M.	59⅞- 62⅜
Lima Loco.	106¼-111		

Industrial Finance

Stockholders of the Lima Locomotive Works, at a recent meeting at Richmond, Va., approved the refinancing plan submitted by the directors of that company. The plan provides that 48,590 shares of common stock, par $100, shall be converted into common stock of no par value in the ratio of two shares of new stock for each one share of original stock held. Common shareholders have the right to subscribe, at $50 a share, for one and one-third shares additional stock of no par value for each existing outstanding share. Preferred shareholders may also obtain the right to subscribe to the new stock by converting their holdings into new common shares.

A public offering is made of $3,600,000 Consolidated Machine Tool Corporation of America first mortgage 20-year 7 per cent sinking fund bonds, dated June 1, and due in 1942. This issue constitutes the corporation's only bonded obligation. Its capitalization otherwise consists of $10,000,000 7 per cent preferred stock of which $6,137,000 is outstanding, and 200,000 shares of common stock of no par value, of which 128,000 shares are outstanding. The total assets of the corporation, after deducting all liabilities other than the funded debt, are placed by the management at $10,269,589, stress being put on the fact that no valuation has been placed on good-will, contracts or business connections of the company. The current assets are more than six times the current liabilities.

The Gulf States Steel Co., for the quarter ended June 30, 1922, reports net operating income of $313,740 against $34,396 in the same period last year. After allowing for all charges, including taxes, depreciation and interest, there was a balance of $225,664 against a deficit of $53,353 in 1921.

The Union Trust Co., Pittsburgh, is asking tenders as trustees on $90,000 Aluminum Goods Mfg. Co. 10-year 7½ per cent gold notes. Tenders must be received on or before noon July 31.

Vanadium Corporation of America reports for the six months ended June 30, net income of $18,566 after depreciation and depletion, against a deficit of $64,204 in the first half of 1921.

The Frick-Reid Supply Co., Pittsburgh, has given notice that it will redeem on Sept. 15 next, its $1,500,000 outstanding preferred stock at 107, and at the same time will pay a dividend of $2 per share, which will accrue from June 15, to the date of redemption. Stockholders are requested to surrender for cancellation their holdings of these shares to either the company direct, or to the Bank of Pittsburgh, N. A.

The financial statement of the Hayes Wheel Co. for the six months ended June 30, shows a net of $544,321, compared with $269,682 for the same period of 1921.

Republic Iron & Steel Profit

The Republic Iron & Steel Co., for the second quarter of 1922, reported a profit after charges of $86,382, equal to 34 cents a share on the preferred stock, compared with a deficit the preceding quarter of $712,082 and a loss of $883,679 for the corresponding quarter of 1921.

The operating profit for the June quarter was $563,053, against an operating loss of $508,447 for the similar three months of last year. Depreciation and renewal charges were $249,575, exhaustion of minerals $22,322 and bond interest $204,774.

For the first half of 1922 the company had an operating profit of $285,989, against a loss of $38,205 for the corresponding period of 1921. The deficit after charges was $625,700, contrasted with a loss of $779,062 in the similar period of the previous year.

Unfilled orders on hand June 30 totaled 196,886 tons, against 130,551 tons on March 31 and 97,265 tons on June 30, 1921.

Colorado Fuel & Iron Quarter

The earnings statement of the Colorado Fuel & Iron Co. for the quarter ending June 30, last, was encouraging in one respect; namely, the cutting down of the deficit. The company in that period showed a loss of $18,430, contrasted with a loss of $431,269 in the preceding quarter, and $273,752 in the corresponding three months last year, after providing for interest on outstanding obligations, taxes, the sinking fund and depreciation.

General Motors Earnings

Net earnings of the General Motors Corporation for the six months ending June 30 were $35,116,481. This amounts to $1.30 per share. Its net sales for this period totalled $218,490,887. After all charges, the amount available for the common stock was $26,839,391. The first quarter of 1922 showed sales amounting to $80,590,887, and net earnings $9,146,481.

Receivers for Thurlow Steel Works

The Delaware County Court at Media, Pa., has appointed receivers for the Thurlow Steel Works, Chester, Pa. It was stated in court that the company owed more than $1,000,000. It was organized in 1916 with a capital of $25,000 to manufacture machine tools to machine shells and was forced to shut down when the war ended.

Trade Changes

The Groton Iron Works, New London, Conn., has been leased by the New York, New Haven & Hartford Railroad, according to an announcement by an official of the railroad company. The strike making it impossible to get certain grades of work done was declared to be the reason for the change. The Groton concern, which employed 5000 men during the war, was recently put into a receiver's hands. Present plans are to employ about 800 men to repair locomotives which cannot be handled by the Baldwin Locomotive Works and other plants.

The National Tool Co., Cleveland, has taken over the Save-All chuck business of the Save-All Tool Co., Waltham, Mass. J. C. Dufresne has been employed as manager of the Save-All end.

Commencing Aug. 1 the Drake Hardware Co., Friendship, N. Y., will change its name to the Drake Mfg. Co., Inc.

The Conveyors' Corporation of America, 326 West Madison Street, Chicago, has appointed the Mid-West Engineering Sales Co., Masonic Temple, Cedar Rapids, Iowa, representative in eastern Iowa for the sale of American trolley carriers, which are coal handling equipment of the monorail type. J. W. Holden is manager of the Mid-West Engineering Sales Co.

J. S. Morrison Co., Oliver Building, Pittsburgh, for some years distributor in that district for rolled, forged and cast

manganese steel products, has recently added "wearite" steel to its line of wear resisting steels.

The Nilson-Miller Co., Hoboken, N. J., announces that it has changed its name to Nilson Miller Corporation.

Burt Harris, 30 Church Street, New York, dealer in iron and steel, has taken over the exclusive sales of the Mineral Oil Paint Co., Port Allegheny, Pa.

The Peck Spring Co., Plainville, Conn., maker of springs for typewriters, adding machines and the like and springs of both steel and phosphor bronze, has added screw machines to its equipment.

Plans of New Companies

[No news in regard to new incorporations is published in THE IRON AGE until it has been investigated by correspondence or by personal call.]

R. A. Lister & Co., Inc., is opening an office at 101 Park Avenue, New York. It has recently been incorporated with a capital of 1000 shares, no par value, to import and eventually to manufacture the Lister-Buston automatic electric lighting plant and other machinery. It will also be the agency of R. A. Lister & Co., Ltd., Durisley, England, which has an organization extending throughout all important parts of the world. This new branch is entirely owned and directed by the R. A. Lister Co., Ltd. of England, but it proposes to take in certain American interests which already have some knowledge of these electric plants. The directors have expressed a desire to share the advantage of American banking, and they are now open for banking connections. L. Burbidge is acting as president of the American company, which is represented by J. K. Byard, 120 Broadway, New York. The directors are: George A. Lister, president of the Canadian company, R. A. Lister & Co., Ltd., 58 Stewart Street, Toronto; L. Burbidge and H. M. Towart.

The Driscoll Mfg. Co., Brooklyn, has incorporated with a capital of $50,000, for the purpose of manufacturing wireless instruments and equipment. The directors are J. F. Driscoll, L. M. Baer and E. Levy. Address Goodman & Werner, 51 Chambers Street, New York.

The Manhattan Crown Seal Co., New York, has filed articles of incorporation with a capital of $50,000. It will manufacture metal bottle seals and kindred articles. The incorporators are C. C. Abbott, L. M. Rosenthal, Samuel Rosenthal and C. L. Hoadley. Address C. J. Austrian, 27 Cedar Street, New York.

The Monarch Appliance & Radio Corporation, New York, has been incorporated with a capital of $10,000. The Monarch vacuum cleaner is the main product, but wireless outfits and accessories will also be made. Incorporators: L. Goldberg and A. J. Kollin. Address Jacob W. Block, attorney, 186 Fifth Avenue, New York.

The Marco Metal Works, Inc., Brooklyn, recently incorporated with a capital of $20,000, will manufacture metal goods, wireless equipment and accessories. Incorporators: M. Wetztein, Max Planshaft and Robert Tow. The company's plant is equipped.

The H. & S. Automotive Corporation, New York, has been incorporated with a capital of $10,000 to manufacture automobile equipment and parts. Incorporators: H. Hegeman, C. P. Brown and O. Herrmann. Address Otto Greenberger, 368 Broome Street, New York.

The Modern Automatic Match Machinery Co., New York, has been incorporated with a capital of $10,000 to manufacture matches, match machinery and parts. Incorporators: C. B. Kinberg, S. M. Wittner and S. M. Friede. Address S. M. Wittner, 565 Fifth Avenue, New York.

Lebarron Carrossiers, Inc., New York, will manufacture automobile parts, motors and particularly bodies. Its capitalization is $10,000. Incorporators: R. S. Roberts, T. L. Hibbard and R. H. Dietrich. The company is already manufacturing. Address W. H. Ives, 38 Park Row, New York.

The Racony Corporation, New York, recently incorporated with a capital of $20,000, will manufacture wireless equipment and parts. Incorporators: F. Lewin, A. L. Hecht, Nathan Reznikoff and Julius Schoenberg, Samuel Rubin, 120 Broadway, New York.

Gillis & Geoghegan, Inc., New York, has been incorporated with a capital of $25,000 to manufacture heating and ventilating equipment. Incorporators: W. M. G. Watson, H. A. St. George and B. W. Dennis. Address Phillips & Avery, 41 Park Row, New York.

The Conly Stoker Co., New York, has been incorporated with a capital of $100,000. The main item of manufacture is an automatic traveling-grate stoker on which it is ready to receive orders. Incorporators: J. A. Conly, O. S. Magnus and J. H. Eilers, Jr. Address N. J. Toomey, 280 Broadway, New York.

The Mortimer Radio Corporation, New York, has been incorporated with a capital of $50,000 to manufacture wireless equipment and instruments. Incorporators: M. L. Newman, A. Birnbaum and L. Levy. Address Price Brothers, 261 Broadway, New York.

The Electrolock Mfg. Co., Vicksburg, Miss., has applied for a charter of incorporation which it expects to receive in a few days. Capital stock will be $100,000. This company is negotiating with several manufacturers with the idea of contracting for the manufacture and possibly the sale of the Electrolock device for locking automobiles. Representatives have been sent North with models and specifications. In case a suitable agreement for manufacturing cannot be closed the company plans to do its own manufacturing.

The B. & C. Magneto Co., New York, has been incorporated with a capital stock of $15,000 to manufacture magnetoes and kindred automotive equipment. Incorporators: J. A. Cordary, M. Cordary, and E. R. Horowitz. Address D. M. Freedman, 233 Broadway, New York.

The Squire Mfg. Corporation, 280 Madison Avenue, New York, is manufacturing under contract and distributing patented cooking articles and oil burners.

The Columbia Fence & Wire Co., Dallas, Tex., has its plant over half completed. It is in the market for machinery, such as punch machines, dies, shears and any equipment necessary to a wire fence plant.

The Binghamton Engineering Co. recently organized at Binghamton, N. Y. with A. L. Gilmore as president and Geo. H. Young as treasurer, has opened offices at 777 O'Neil Building for conducting steel and iron business. This company is specializing in the design, fabrication and erection of structural steel, and has recently closed contracts for the erection of the new Masonic Temple, Binghamton Gas Works, and some towers for the Binghamton Light, Heat & Power Co. Contracts have also been closed for structural steel for St. Paul's School, the Chevrolet Garage, a church in Port Dickinson, N. Y., the hospital in Corning, N. Y., and the Red Men's Building at Endicott, N. Y.

The John W. Flower Engineering Co., 2372 West Grand Boulevard, Detroit, has been organized to manufacture a line of water works supplies, together with a patented system of filtration and operating tables. John W. Flower, who is head of the new company, has long been identified with the manufacture of water works supplies. The company has not decided whether to make its new products in a plant of its own. Another company may be organized to conduct the manufacturing work.

The Wright Battery Co., Lynn, Ind., has been organized to manufacture batteries. The company has purchased all of the equipment it will need for the present, but is considering contracting for the manufacture of battery boxes, plates, separators, sealing compounds and other materials which enter into battery manufacture.

The Abbey-Scherer Co., Detroit, has organized a new company to be known as the Advance Wire Works, Ltd., which will engage in the manufacture of some of the products which have been made by the Abbey-Scherer Co. Later on the Advance Wire Works may erect its own building and put in its own equipment. John R. Scherer is president of both companies and other officers are practically the same.

The Reo Motor Car Co., Lansing Mich., has leased a small plant opposite the Swedish Crucible Steel Co. plant at Windsor, Ont. The leased plant is to be used by the Reo Motor Car Co. of Canada, Ltd.

The Dearborn Tractor Appliance Co., Dearborn, Mich., recently incorporated with a capital of $25,000, will manufacture some of the articles it expects to handle while others will be manufactured under contract. A little later the company may be in the market for equipment.

The Midland Electric Mfg. Co., 220 South State Street, Chicago, does not intend to build at the present time. It is manufacturing and selling an electric hair waver by contract with another firm, although it may manufacture it in the near future.

An automotive production meeting is to be held by the Society of Automotive Engineers in Detroit, Oct. 26 and 27. Papers will be read in the mornings of the days and the afternoons will be devoted to factory inspection trips, with the evening of Thursday given over to a "production" dinner.

STEEL CORPORATION EARNINGS

Second Quarter Shows Marked Improvement for Each Month

The report of the United States Steel Corporation for the second quarter of 1922 shows a comfortable increase in net earnings for the first quarter, the figures being $19,339,985 for the first quarter and $27,286,945 for the second quarter. In the first quarter the earnings increased from $4,654,134 in January to $8,505,166 in March, and in the second quarter the increase was from $7,750,054 in April to $10,712,004 in June. The deficit after the payment of dividends was $6,749,468 at the end of the first quarter and for the second quarter it was $1,462,345.

The usual quarterly dividends of 1¾ on preferred and 1¼ on common were declared Tuesday. The earnings for the first two quarters of 1922 and for the preceding years were as follows:

Quarters	1922	1921	1920	1919
First	$19,339,985	$32,286,722	$42,089,019	$33,513,384
Second ...	27,286,945	21,892,016	43,155,705	34,331,301
Third	.....	18,918,058	48,051,540	40,177,232
Fourth ...	.....	19,612,033	43,877,862	35,791,302
Net earnings each year		$92,708,827	$177,174,126	$143,813,219

Earnings for Second Quarter, 1922

	Earnings Before Charging Interest on the Subsidiary Companies' Bonds Outstanding	Less: Interest on the Subsidiary Companies' Bonds Outstanding	Balance of Earnings
April, 1922.....	$8,399,560	$649,506	$7,750,054
May, 1922.....	9,512,938	688,051	8,824,887
June, 1922.....	11,417,757	705,753	10,712,004
	$29,330,255	$2,043,310	
Net earnings			$27,286,945
Less charges and allowances for depreciation and sinking funds.....			11,067,432
Net income			$16,219,513
Deduct interest for the quarter on U. S. Steel Corporation bonds..	$4,823,158		
Premium on bonds redeemed....	200,000		
			5,023,158
Balance			$11,196,355
Dividends on stocks of the United States Steel Corporation, viz.:			
Preferred, 1¾ per cent.....	$6,304,919		
Common, 1¼ per cent.....	6,353,781		
			12,658,700
Deficit			$1,462,345

Sound Detector Promising Broad Field of Usefulness

WASHINGTON, July 25.—As the result of experiments made by the Bureau of Mines, the geophone, a novel instrument developed in the war for the detection of earth and rock sounds, promises to become an active factor in the saving of the lives of entombed miners. In tests near Pittsburgh blows with a sledge on a coal face were heard at a distance of 650 ft., with various rooms and entries intervening. On a suspended pipe line, light hammering with the knuckles was detected at a distance of 1500 feet. Ordinary talking and singing could be detected through 150 ft. of solid coal. By the use of two geophones, one instrument to each ear, it is possible to determine the direction from which a sound is coming through the earth. Tests conducted at a busy corner in the downtown district of Pittsburgh located a leak in a water main which the water company had for two weeks vainly sought to detect.

The instrument was invented by the French during the war to detect sapping and underground mining operations. It was developed by the United States engineers, and the instruments now used by the Bureau of Mines were made according to plans drawn by them, except for the introduction of different diaphragms.

MORE PLANTS SUSPEND

Six Blast Furnaces in the Valleys—Coke Production Reduced

YOUNGSTOWN, July 25.—Additional curtailments in iron and steel plant operations in the Mahoning Valley are occurring due to restricted coal supplies. Five blast furnaces have already suspended in the Youngstown district, and Shenango furnace, Sharpsville, Pa., was banked July 22. Fuel shortage forced suspension July 19 of the Cherry Valley furnace at Leetonia, operated by the United Iron & Steel Co. The Youngstown Sheet & Tube Co. has reduced the number of its active by-product coke ovens, thereby decreasing coke production. Coking time of the producing ovens is being lengthened.

Steel makers are concentrating all efforts to obtain fuel and keep their properties operating. Fuel oil, gas and tar are being employed as acceptable substitutes for coal. Small quantities of coal are being shipped into the Valleys from the Pittsburgh and Connellsville regions, but the prices asked are excessive, say industrial buyers. For instance, one large consuming interest reports it was offered gas coal at Pittsburgh at $8. Some mining interests in Kentucky and West Virginia are asking from $7 to $8.

There has been little or no improvement in transportation on railroad tapping the Southern mining districts and connecting with trunk line carriers reaching the Valley district. These roads are still paralyzed by congestion.

Under the promise of Federal protection, Valley independents are considering plans to operate their Pennsylvania coal workings on a larger scale, or to resume where such mines are idle. Operators, however, believe such a move must be concerted if it is to be successful, and contend that all interests must act in conjunction.

They believe many men will go back, if assured of proper protection. Steel companies have sent representatives to the mining districts where coal shipments have been held up, in an effort to expedite such movement, but without appreciable result.

Other difficulties are likewise developing which threaten to cut into operations. The strike has interfered with operations of the Valley Mould & Iron Corporation, Sharpsville, Pa., supplying ingot moulds to Valley steel plants. Any prolonged interruption to the supply of molds will have a hampering effect on steel department operations.

Difficulty has also been encountered in getting through shipments of a fluxing stone employed extensively by Valley independents in the open-hearth process. This stone is quarried near Millersburg, W. Va., and shipments have been largely reduced, though plants have fairly abundant stocks.

In the face of active demand for lapweld and buttweld sizes of pipe, Valley makers are endeavoring to maintain production, and 15 of 17 pipe furnaces are fired this week. The Youngstown Sheet & Tube Co. is operating ten and Republic Iron & Steel Co. five.

There has been as yet less interference with semi-finished production than with pig iron, aside from suspension of the Bessemer department of the Republic company. The Ashtabula Steel Co., completing an eight-mill sheet property at Ashtabula, Ohio, has closed on part of its sheet bar requirements with a Valley independent. The company plans to begin rolling down bars in August.

The billet and blooming mill at the Sydney, N. S., plant of the Dominion Steel Corporation, are now working double shift, according to a statement issued by the British Empire Steel Corporation headquarters. This new activity will increase the working force to 2300 men. For the first time in the 22 years of its history, the Dominion Steel Corporation has successfully entered the foreign market for finished steel products. Orders are on hand for nails, barbed and galvanized wire for Buenos Aires, South Africa, New Zealand, Costa Rico, Colombia, India and British West Indies.

PERSONAL

Bertram D. Quarrie has been appointed general manager of the Otis Steel Co., Cleveland, and will have charge of the operations of the company's plants under Parker F. Wilson, who has had the title of assistant to the president and general manager. Mr. Wilson's duties will be broadened, and hereafter he will devote considerable attention to the sales department in addition to his other work. Mr. Quarrie, for the past 12 years, has been general superintendent of the blast furnaces and steel works of the American Steel & Wire Co. in Cleveland and has resigned this position to assume his new duties about Aug. 10. He graduated from Case School of Applied Science in 1903. For a time he was connected with the Grasselli Chemical Co. as a chemist, later went with the Cleveland Furnace Co., as chief chemist, and shortly afterward was appointed blast furnace superintendent of the latter company. He left that company to become assistant blast furnace superintendent of the Cleveland furnaces of the American Steel & Wire Co. For a short time, he was blast furnace superintendent of the Inland Steel Co., Indiana Harbor, Ind., but returned to the Central Furnaces as superintendent. Mr. Quarrie was appointed to his present position in 1910, when Henry A. Barren was promoted to the general superintendency of all the blast furnaces of the American Steel & Wire Co., in the Cleveland, Pittsburgh and Donora districts.

B. D. QUARRIE

O. P. Hood, chief mechanical engineer of the Bureau of Mines, sailed on July 12 for London. He will spend three months in Europe studying new developments in lignite utilization and the low-temperature carbonization of coal, for the purpose of applying the information to studies in lignite and fuel utilization now being conducted under his direction in the United States by the Bureau of Mines. Mr. Hood will visit England, Germany, Switzerland, Belgium, Holland, Jugoslavia, Czecho-Slovakia, Austria, Italy and France.

F. H. Chapin, vice-president and general manager Upson works of the Bourne-Fuller Co., Cleveland, returned a few days ago from an extended trip to Europe.

L. E. Armstrong, formerly of the engineering department of the Heine Boiler Co., St. Louis, has connected with the Bass Foundry & Machine Co., Fort Wayne, Ind.

H. G. Hoss has been appointed general manager of the Ott Grinder Co., Indianapolis. He was with the Vonnegut Machinery Co. for 11 years, and prior to that was connected with the International Machine Tool Co., both of Indianapolis.

J. A. Beaubien, formerly vice-president and general manager of the Weber Subterranean Pump Co., 50 East Forty-second Street, New York, has been made manager of the New York office of the Pennsylvania Pump & Compressor Co., Easton, Pa.

E. R. Abbott, former New York representative for the Taft-Pierce Mfg. Co., has joined the Dupont Engineering Co., Wilmington, Del., as sales representative for the Wilmington shops, recently opened to contract work.

G. C. Kimmel has been appointed consulting engineer of the Heald Machine Co., Worcester, Mass.

E. C. Rack, former assistant manager of the Precision Instrument Co., Newark, N. J., is now associated with the Johns-Manville Co., Inc. He will engage in research and engineering work in the general offices of the company at New York.

G. M. Thompson, Worcester, Mass., has resigned as vice-president and general manager Wickwire Spencer Steel Corporation, but remains as a member of the board. Mr. Thompson was president of the Clinton, Wright Wire Co. when it was absorbed by the Wickwire-Spencer Steel Corporation, and has been identified with the wire industry for more than 27 years. His health has been impaired for some time and his resignation is with a view of lightening his responsibilities.

Commander A. J. Chantry, Jr., U. S. N., has reported to the Charlestown Navy Yard, Boston, as production manager. He succeeds Commander W. B. Fogarty, who has been assigned to duty at Groton, Conn., as superintendent Electric Boat Co. Commander Chantry formerly was attached to the Philadelphia Navy Yard.

H. F. Barrus, for some years associated with the Union Twist Drill Co., Athol, Mass., has accepted a position as general manager Barrus & Cullen of London, England, and will leave Athol about Sept. 1.

M. B. Layton, a vice-president of the Manufacturers' Light & Heat Co., Pittsburgh, supplier of natural gas, has resigned and will devote most of his time looking after his private gas and oil interests.

W. B. Schiller, president National Tube Co., Frick Building, Pittsburgh, is back at his desk again after being confined in the hospital for some time recovering from an operation on his ankle.

Dr. T. T. Read, chief of the information service of the United States Bureau of Mines, has been appointed by the president of the American Institute of Mining and Metallurgical Engineers the official representative of the institute to attend the International Congress of Engineering, to be held in Rio de Janeiro, Brazil, in September. Dr. Read expects to leave for Rio de Janeiro about Aug. 15.

William S. Silpath, who for 25 years represented the Buffalo Wire Works Co. in the Philadelphia district, has become general manager of the Hub Wire Cloth & Water Works Co., Boston.

F. S. Cox, formerly assistant to the consulting engineer of the Pittsburgh Plate Glass Co., is now chief engineer of the Calorizing Co. of Pittsburgh, and will have direct charge of the Wilkinsburg, Pa., plant, in addition to other duties.

Edward Peterson has become associated with the Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., as chief engineer. He was formerly assistant chief engineer of the Treadwell Engineering Co., Easton, Pa., and prior to that was assistant to A. F. Backlin, chief engineer of the American Steel & Wire Co., Pittsburgh.

Robert W. Appleton, production engineer of the Pierce Arrow Motor Car Co., Buffalo, has been appointed manager of purchases of that company. He will also continue his duties as production engineer. He has been identified with the Pierce Arrow factory for more than 20 years.

Earl S. Murton, who has been hot mill foreman at the plant of the Inland Steel Co., Indiana Harbor, Ind., recently was promoted to the position of assistant superintendent of the sheet department. Prior to going to the Inland Steel Co., Mr. Murton was with the Canton Sheet Steel Co., Canton, Ohio.

James C. Potter, president, the Potter & Johnston Machine Co., Pawtucket, R. I., recently returned from a trip to Europe.

W. P. Snyder, Jr., president Shenango Furnace Co., Pittsburgh, has sailed for Europe.

James H. Walsh, for 20 years superintendent the rolling department, South Chicago works, Illinois Steel Co., recently resigned that position to become as-

sistant general superintendent the Inland Steel Co., Indiana Harbor, Ind.

F. W. Carter, assistant manager the heavy traffic division, railway department, Westinghouse Electric & Mfg. Co., has resigned to become president of the Louisville Frog & Switch Co., Louisville. Mr. Carter graduated in electrical engineering from the Virginia Military Institute in 1912, and in that year entered the employ of the Westinghouse company in the graduate students' course. Between 1912 and 1916, he filled several important assignments, and then took up heavy traction work in the New York office. The Louisville Frog & Switch Co. manufactures manganese frogs, crossings, switches, signals and other railway specialties.

OBITUARY

CLARENCE H. GAY, for many years identified with the iron and steel business of New England, died June 30, at his home in Boston. He was a native of that city, born in 1833.

GEORGE W. HAMILTON, for 16 years assistant general superintendent Bay View mills, Illinois Steel Co., at Milwaukee, died suddenly of heart failure on July 20, while on a train en route to his summer home on Green Lake, Wis. He was born in Johnstown, Pa., Nov. 1, 1848, and went to Milwaukee in 1906 to take an executive post in the Bay View mills. He was prominent in Masonic and business circles.

ALBERT L. JOHNSON, president the Corrugated Bar Co., Buffalo, died Friday, July 21, at his home in Hamburg, N. Y., a suburb of Buffalo.

C. L. TOWER, New England representative the Babcock & Wilcox Co., steam boilers, died July 19 at his summer home in Allerton, Mass., in his 35th year. He was a member of the American Society of Mechanical Engineers, the Engineers' Club of Boston, and other organizations.

June Automobile Production

Figures received by the Department of Commerce show a further increase in the June production of passenger automobiles and trucks. The total production of passenger cars in June, so far reported, amounted to 261,963, compared to 231,724 in May. This is an increase of over 11 per cent for the month. The total truck production in June was 25,912 machines, compared with the revised figures of 23,803 in May.

With a few exceptions the following table represents the production of identical firms for each month including approximately 90 passenger car and 80 truck manufacturers.

Automobile and Truck Production

1922	Passenger Cars	Trucks
January	81,693	9,344
February	109,170	13,121
March	152,959	19,651
April	197,221	22,227
May	231,724*	23,803*
June	261,963	25,912

*Revised.

Examinations for the position of appraisal engineer, carrying a salary of $3,000 to $4,000 per annum, said engineer to be attached to the technical staff of the income tax unit of the Bureau of Internal Revenue, has been announced by the United States Civil Service Commission. Applicants should apply to the commission at Washington for form 2118, stating the title of the examination desired. An examination is also shortly to take place for architectural and structural steel draftsman for the lighthouse service. Applicants should apply for form 1312, stating the title of the examination desired.

UPHOLD JUDGE LANDIS

Labor Union Investigators in Chicago Submit Their Report

CHICAGO, July 24.—A special committee, composed of the presidents of the international building trades unions, which has been holding hearings here on the Landis award of last fall in the building trades controversy, with an idea of bringing about a clarification of the situation, on Saturday submitted a report which completely upholds the award and suggests a reorganization of the Chicago Building Trades Council on a basis of entire recognition of the Landis decision.

The investigation was conducted in accordance with a resolution adopted at the annual convention of the American Federation of Labor at Cincinnati early last month. As is well known, the Landis award did not find favor with a number of crafts and it is no secret that some of the contractors have been violating its precepts. Conditions have been chaotic with distinct wage scales and working conditions for union and non-union workmen. The committee finds that the trouble is due "to the failure of the Chicago Building Trades Council to meet and fulfill its moral obligation as regards its arbitration agreements and the award of its chosen arbiter, Judge Landis."

Evidently, this move toward peace on the part of the unions is not going to find ready acceptance, because James A. Patten, chairman of the citizens' committee for the enforcement of the Landis award, has come out with a statement which indicates that the committee will continue to fight for the establishment of the "open shop." Mr. Patten says: "There can be no compromise with those crafts that refused to work under the award. The open shop plan will still be in effect as to the 13 groups involved. The committee has made its decision and will not yield. The committee has brought 16,000 men to Chicago to work under the award; they will continue in their jobs."

Equipment for a Great Cleveland Building

Considerable mechanical and other equipment and steel for interior construction will be required for the new building of the Union Trust Co., Cleveland, which will be the second largest building in the world. With 1,000,000 sq. ft. of floor space, it will be exceeded in size only by the Equitable Building in New York with 1,200,000 sq. ft. of floor space. There will be 25 passenger elevators, 10 bank elevators serving six floors and three freight elevators, which will be furnished by the Otis Elevator Co. It will be a fire proof building throughout with metal doors and trim and metal window frames and sash. The building will require 1100 or more tons of galvanized steel pipe which will be supplied by the Youngstown Sheet & Tube Co. The electric conduits will take 450 tons, the plumbing 450 tons and the heating system 200 to 250 tons. A large blower fan system will be installed to provide forced air ventilation for banking rooms and lavatories. W. B. VanSickle, Cleveland, has the contract for both the ventilating and heating. Electric current for power and light will be supplied by a commercial company, but it has not yet been decided whether to put in a heating plant or to buy steam from a commercial producer. The contract for the vault doors, vault linings, and deposit boxes has been placed with the Diebold Safe & Lock Co., Canton, Ohio. These will require about 850 tons of steel, largely in alloy steel plates. The building will have 2200 doors and the hardware will cost $75,000 or more. Contracts for this will be placed shortly.

An increase in the number of employees of Milwaukee industries in June embraced additions of from 200 to 500 men each by three or four of the large metal-working concerns, according to the July issue of Business and Financial Comment, published by the commercial research department of the First Wisconsin National Bank, Milwaukee.

Machinery Markets and News of the Works

STRIKES AFFECT BUYING

Machine-Tool Business Continues in Fair Volume, However

Some Purchases Are Being Held Up Pending Settlement of Present Labor Troubles

Although July business in machine tools continues at a rate which compares favorably with that of June, it is evident that many prospective purchases are being held back pending a settlement of the labor troubles at the coal mines and on the railroads. Railroad buying, which had gotten a fair start before the shop mechanics' strike, has been checked, the railroads announcing that orders will not be placed until their present operating troubles are out of the way. Repair work on locomotives and cars has made it necessary for locomotive and car companies to add to their shop equipment in a small way, outstanding purchases being a driving wheel lathe and car wheel lathe by the American Locomotive Co. and a multiple punch by the American Car & Foundry Co. The Boston & Albany Railroad has bought a driving wheel lathe and one other machine. The Chicago, Milwaukee & St. Paul has added several items to its recent inquiries. Further purchases by the Atchison, Topeka & Sante Fe are apparently being delayed until the rail strike is settled. There is an intimation that the Illinois Central may place a few orders this week.

Municipal purchases for vocational training schools continue a fairly important factor. The Youngstown Board of Education has ordered about 25 metal-working and woodworking tools from two or three dealers, and the city of Boston is in the market for a number of tools and accessories. The Belleville Research Laboratories, Navy Department, Washington, has inquired for lathes, shapers and drill grinders, bids closing Aug. 1.

Export business is dull and the sale of a few machines to a South American country is exceptional among current export transactions.

New York

NEW YORK, July 25.

THERE are few developments of interest in the local machine-tool market. Buying of tools by the railroads has almost wholly stopped, due to the shop mechanics' strike, but business from other sources keeps up at a rate that is fully equal to that of June and in some instances is better than the June records. The American Locomotive Co., New York, has purchased a 90-in. driving wheel lathe and a 42-in. car wheel lathe, and the American Car & Foundry Co., New York, has bought a multiple punch, these companies adding this equipment in all probability to take care of the present rush of repair work on locomotives and cars. The Belleville Research Laboratory of the Navy Department, Washington, has inquired for lathes, shapers and drill grinders, bids closing Aug. 1. Export business is not active, and a sale of several machines for shipment to South America stands out as exceptional among current export transactions in machine tools.

From the standpoint of new inquiries the crane market is quiet, but several orders are pending and a number of overhead cranes were purchased the past week. The 60-ton electric crane recently asked for by the J. G. White Engineering Co. is expected to be closed during the next few days. Action will also probably be taken shortly on the 110-ton crane for a power house, which has been in the market for some time. Sales of hand power cranes are light. Business in locomotive cranes, however, is fairly active in both new and used. Among recent purchases are:

Monitor Bi-Loop Radiator Co., Lancaster, Pa., one 15-ton, 58-ft. span, one 5-ton, 47-ft. span and two 5-ton, 27-ft. span, electric cranes from the Northern Engineering Works.

Frick Co., Waynesboro, Pa., a 25-ton, 68-ft. span electric crane from the Shepard Electric Crane & Hoist Co. and a 10-ton, 74-ft. span and two 5-ton, 35-ft. span electric cranes from Maris Brothers.

Michlowitz & Co., Harrisburg, Pa., a 20-ton, 50-ft. boom locomotive crane for use at Lebanon, Pa., from the Browning Co.

H. B. Streicher Co., Toledo, Ohio, a 20-ton, 50-ft. boom used Ohio Locomotive crane for Oil City, Pa., from Philip T. King, 30 Church Street, New York.

Bertoline Quarries Co., New Haven, Conn., a used Type B., Erie steam shovel from Philip T. King, 30 Church Street, New York.

Schaefs Foundry, New Orleans, a 1-ton electric traveling crane from the Northern Engineering Works.

Magnolia Petroleum Co., Dallas, Tex., one 25-ton and two 10-ton, 50-ft. spans, overhead traveling cranes from the Northern Engineering Works.

Follansbee Brothers Co., Pittsburgh, a 7½-ton heavy duty monorail hoist for Toronto, Canada, from the Northern Engineering Works.

The Air Reduction Sales Co., 342 Madison Avenue, New York, manufacturer of welding and cutting apparatus, has plans under way for new works at Birmingham, Ala. Other units will be constructed later, with total cost estimated at $250,000, including equipment.

A. L. Kushner, 15 Central Avenue, Albany, N. Y., is taking bids for a new two-story automobile service and repair building at 43-7 Columbia Street, 70 x 250 ft., to include machine shop, estimated to cost about $90,000. Howard Rogers, 443 Broadway, Albany, is architect.

The W. S. Freezer & Machine Corporation, 270 Union Avenue, Brooklyn, will install a new gas engine and subsidiary power equipment at its plant.

The Nevada Consolidated Copper Co., 25 Broad Street, New York, has plans under way for rebuilding its concentrating plant, recently destroyed by fire, with loss estimated at about $2,000,000, including machinery, electrical and power equipment. The new unit will be of like size and cost, approximately, the amount of the loss.

U. G. Stockwell, 175 Jay Street, Albany, N. Y., is planning the erection of a new automobile service and repair building, estimated to cost about $250,000.

The Murphy Garage, Inc., New York, has leased for 21 years the building now being erected on West 133rd Street, near Broadway, for the establishment of an automobile service and machine repair works. William A. Murphy is president.

Motors, controlling equipment, conveying apparatus and

other equipment will be installed in the nine-story printing plant, 60 x 103 ft., to be erected at 147-51 West Fifteenth Street, New York, by Street & Smith, 79 Seventh Avenue, publishers, estimated to cost about $150,000, exclusive of equipment.

The Turner-Armour Co., 567 Flushing Avenue, Brooklyn, has plans under way for a three-story addition, 62 x 300 ft., to its cabinet works on Harrison Place, estimated to cost about $65,000. John E. Nitchie, World Building, New York, is architect.

The Pyramid Iron Products Corporation, 2 Rector Street, New York, will purchase a Corliss engine and subsidiary power equipment for its plant.

The Watson Elevator Co., 407 East Thirty-sixth Street, New York, has completed the purchase of the plant and business of the Reedy Elevator Co., at 1226 Willow Avenue, Hoboken, N. J. It will be used exclusively for Watson type elevators, parts, etc. A repair and service department will be operated from this location, and a similar plant now at 407 West Thirty-sixth Street, New York, continued in operation.

The Board of Public Works, Albany, N. Y., will commence the erection of the new dam on the State Barge Canal at Crescent, about 12 miles north of Albany, and will soon begin work on a hydroelectric generating plant, estimated to cost $1,000,000. Charles L. Cadle is superintendent of Public Works, in charge.

A power house will be installed in connection with the new one-story plant to be erected on Saw Mill Road, Elmsford, N. Y., by the Horace L. Day Co., 4 White Street, New York, for the manufacture of chocolate products, estimated to cost about $250,000.

The Johns-Manville Co., Madison Avenue and Forty-first Street, New York, manufacturer of asbestos and fireproofing products, has acquired the Bennett Martin mining properties at Thetford Mines, Que., and proposes to break ground at an early date for a new plant at Asbestos, Que., estimated to cost approximately $1,000,000, including machinery. The initial works will give employment to about 300 and it is expected to have the mill ready for operation by the end of the year.

Durant Motors, Inc., 1819 Broadway, New York, has concluded negotiations for the purchase of the Locomobile Co., Bridgeport, Conn., including plant and business, for about $2,000,000, and W. C. Durant has been elected president of the company. Operations will be continued at the Bridgeport works and no immediate change, it is said, will be made.

The Tunnel Garage, Inc., 55 Thompson Street, New York, has awarded a contract to T. J. Murphy, Inc., 2 West Forty-fifth Street, for a new two-story automobile service and repair works at Broome and Thompson streets, estimated to cost about $55,000.

The American Water Works & Electric Co., 50 Broad Street, New York, operating the West Penn Co., Pittsburgh, and other light and power companies, is disposing of a preferred stock issue of $1,200,000, the proceeds to be used in connection with the acquisition of the Potomac Public Service Co., operating in western Maryland, Virginia and Pennsylvania, and for extensions and improvements in plants and system. Hobart Porter is president.

The Samcee Corporation, New York, has acquired through G. Montague Mabie, 33 West Forty-second Street, property on Columbus Avenue, between 204th and 205th streets, 100 x 200 ft., and will have plans prepared for a one-story automobile service and repair building.

Motors, conveying equipment, power and other equipment will be installed in the new one-story printing plant to be erected at Ossining, N. Y., 150 x 150 ft., by Rand, McNally & Co., 42 East Twenty-second Street, New York, with headquarters at 538 South Clark Street, Chicago. H. Lansing Quick, 18 South Broadway, Yonkers, N. Y., is architect.

A vocational department will be installed in the new three-story high school, 150 x 150 ft., to be erected at Saratoga Springs, N. Y., estimated to cost about $400,000, for which bids will be asked early in August. Coffin & Coffin, 522 Fifth Avenue, New York, N. Y., are architects. Charles L. Mosher is secretary of the school board.

The Standard Oil Co. of New Jersey, 31 Clinton Street, Newark, will build a new distributing plant, with electric station in the Silver Lake section, Bloomfield, N. J., to cost about $40,000.

The Morris & Somerset Electric Co., Morristown, N. J., has arranged for a bond issue of $200,000, the proceeds to be used for extensions and improvements.

Compounding and mixing machinery, power and other equipment will be installed at the plant of the Atlantic Tar & Chemical Works, Inc., Bayway, Elizabeth, N. J., in connection with plant enlargements. To carry out the project, the company has arranged a capital stock and bond issue for $500,000, the majority of the proceeds to be used for the expansion. George C. Lewis is president.

A bond issue of $401,000 has been approved for the erection of a new high school at West Orange N. J., to include a vocational department, exclusive of site. The latter has been secured in the Rollinson tract for $45,000. Plans will be prepared by Guilbert & Betelle, 546 Broad Street, Newark, architects. Albert Wrensch is secretary of the school board.

Walter C. Jacobs, 9 Campbell Street, Newark, operating a foundry, has commenced foundations for a new three-story plant at 63-73 Warren Street, for which contract recently was let to the American Concrete Steel Co., Essex Building. The new foundry is estimated to cost in excess of $50,000.

Herpers Brothers, 18 Crawford Street, Newark, manufacturing jewelers, are taking bids for a new four-story plant, 52 x 100 ft., at 474-76 Washington Street, estimated to cost close to $50,000. Edward A. Wurth, 207 Market Street, is architect.

Van Vleet, Inc., has been organized, with office at Hedden Place, North Fifteenth Street, Newark, N. J., to engage in auctioning, appraising and financing manufacturing plants. The officers are B. Dorf, president; S. H. Berger, vice-president; Herbert Segal, treasurer.

Chicago

CHICAGO, July 24.

REPORTS about the machine tool business in this district vary, but the more common expression is that considering the time of year and the fact that railroad buying is almost completely suspended, pending a settlement of the labor troubles, business is as good as could be expected. The Chicago, Milwaukee & St. Paul Railroad has just put out a new list, which besides a 20-ton crane, calls for two 36-in. lathes, a 28-in. shaper, 34-in. drill press, 44-in. boring mill and an 1100-lb. steam hammer. A couple of these tools were included in a list sent out some time ago. It is of interest that in its latest inquiry this road omits the suggestion that it will consider good used tools, as it did in the last previous list. The Atchison, Topeka & Santa Fe Railroad has not made any additional purchases against its list put out several weeks ago, about half of which had been placed up to a week ago. This road recently closed for a 15-ton crane for Argentine, Kan., with the Milwaukee Electric Crane & Mfg. Co., Milwaukee. Other railroad lists are dormant, although the report is heard in some quarters that the Illinois Central this week may order some of the tools it recently inquired for.

There have been no price changes the past week, and while there are occasional suggestions of an advance, there are quite as many assertions that no immediate change is likely. It is pointed out that an advance at this time could be based only on the present labor, fuel and transportation conditions, which few regard as any more than temporary.

The Radio Parts Mfg. Co., 1038 Van Buren Street, Chicago, recently incorporated for $10,000, will manufacture variometers, variocouplers and radio parts, and has leased quarters containing 3800 sq. ft., at the above address. It will buy drill and punch presses and winding machines. The officers are Joseph Zabotzsky, president and treasurer; John M. Smith, vice-president, and J. G. Zahradka, secretary.

The Vaughn Machinery Co., 531 McKnight Building, Minneapolis, recently incorporated with a capital of $175,000, is the outgrowth of the Vaughn Mfg. Co. It now has its grain cleaning machinery built, but may eventually have its own plant and will want metal and wood-working machines. The officers are T. C. Vaughn, president; James J. McCanney, vice-president, and P. H. Vaughn, secretary-treasurer.

The American Water Heater Corporation, 2838 West Twenty-first Street, Chicago, has been incorporated with a capital of 2000 shares of no par value. It will manufacture hardware and automobile specialties. Machinery sufficient for present needs has been installed. The officers are Henry Kocourek, president; Louis Aeby, vice-president, and E. F. Gillis, secretary-treasurer.

The Thermalene Gas Corporation, 413 City Bank Building, Kankakee, Ill., has been incorporated with a capital of $60,000 and will manufacture gas generators and supplies. The gas is a new hydrocarbon gas for welding, cutting,

lighting, heating and cooking. Buildings will be leased in Kankakee and all necessary equipment is on hand. The officers are S. D. Knight, president; L. Wolf, vice-president; J. S. Knight, secretary.

The Tyree Auto Radiator Co., 814 West Thirty-third Street, Chicago, incorporated with a capital of $100,000, is manufacturing radiator cores for replacement purposes for automobiles, trucks, tractors and aeroplanes and a complete radiator for Ford cars. The company proposes to build a plant later this year and will want punch presses, sheet metal machinery and specially built machinery, tools and dies. Officers of the company are R. A. Tyree, president; James S. Bradley, vice-president; Fred L. Garst, treasurer and B. M. Rowan, secretary.

The Illinois Publishing & Printing Co., Chicago, publisher of the *Chicago Herald-Examiner* and the *Chicago American*, is reported to have plans for a large printing plant where such parts of the publications as can be printed in advance may be put out. Paul Gerhardt, 64 West Randolph Street, is the architect.

W. F. Hall Printing Co., 466 West Superior Street, Chicago, has bought 14 acres between Diversey Boulevard and Kilpatrick Street, upon which it expects to erect a new printing plant at some future date.

Bids are being received by Henschieu & McLaren, 1637 Prairie Avenue, Chicago, on a 4-story packing plant, 76 x 150 ft. at the Union Stock Yards, for the Western Packing & Provision Co., 3854 South Morgan Street, to cost $170,000.

The Chicago Flanging & Pressing Co., has purchased the property of the Ketler-Elliot Co., 3121 South California Street, Chicago, comprising 43,566 sq. ft. of land, containing a one-story steel fabricating plant and office building. Plans of the purchasing company with regard to improvements and extensions are indefinite at present.

Bowie, Lydon & Co., 340 West Harrison Street, Chicago, has the general contract for a two-story brick and concrete factory for the McAdam Mfg. Co., to cost approximately $100,000.

J. P. & J. W. O'Connor, 189 West Madison Street, Chicago, have the general contract for a two-story and basement addition, 50 x 150 ft., with elevator and heating plant, for Pratt & Lambert, Inc., manufacturer of paints and varnishes, on West Twenty-sixth Street, near Princeton Avenue, Chicago, to cost $60,000.

Contracts have been placed for a two-story, mill construction, factory 40 x 130 ft. at 60 West Superior Street, Chicago, for the F. H. Smith Mfg. Co., machinists, 3047 Carroll Avenue, to cost $40,000.

The Rockford Malleable Iron Works, Rockford, Ill., has awarded contract to the Austin Co., 208 South La Salle Street, Chicago, for a new one-story foundry, 150 x 200 ft., with extension, 90 x 120 ft., estimated to cost in excess of $100,000, including equipment.

The United States Reclamation Service, Washington and Denver, Col., will receive bids until Aug. 18, for furnishing radial gates, radial gate hoists, geared hoists, operating machinery and other iron and metal work for the Riverton, Wyo., project of the department. A. P. Davis is director.

The State Board of Control, Lincoln, Neb., E. B. Fairfield, secretary, has awarded a contract to E. S. Clark & Co., York, Neb., for a new two-story industrial school at Geneva, Neb., 26 x 107 ft., estimated to cost about $50,000.

The Northwestern Paper Co., Cloquet, Minn., has awarded contract to the Siems, Helmers & Schaffner, 514 Guardian Life Building, St. Paul, Minn., for a new two-story paper and pulp mill, 200 x 500 ft., estimated to cost about $500,000, including machinery. George F. Hardy, 209 Broadway, New York, is engineer.

A power house will be constructed at the new high school to be erected at Maquoketa, Iowa, to include a vocational department, estimated to cost about $150,000. Arthur Ebeling, 810 Kahl Building, Davenport, Iowa, is architect.

A vocational department will be installed in the new three-story and basement junior high school, 160 x 200 ft., to be erected at Cedar Rapids, Iowa, estimated to cost about $400,000, for which bids will be asked early in August. Herbert Rugh, 811-13 Security Building, is architect.

The Northwest Refining Co., Billings, Mont., has plans under way for the construction of a new oil refinery at Laurel, Mont., with initial capacity of about 2000 bbl. per day. R. M. Hodgins is general manager.

The Davis-Watkins Dairymen's Mfg. Co., 130 North Wells Street, Chicago, manufacturer of dairy machinery and parts, has awarded contract to the Raulf Co., Milwaukee, for a new one-story plant, 100 x 140 ft., to cost about $75,000.

Work has been placed under way for a new one-story power house at the plant of the Star & Crescent Milling Co., 108 South La Salle Street, Chicago, at South Chicago, Ill., estimated to cost about $35,000.

Philadelphia

PHILADELPHIA, July 24.

The A. H. Fox Gun Co., Eighteenth and Windrim streets, Philadelphia, has acquired property at Eighteenth Street and Wagner Avenue, 303 x 504 ft., as a site for a new plant. Plans will be prepared at an early date.

The Badenhausen Boiler Co. and the Badenhausen Co., 1425 Chestnut Street, Philadelphia, manufacturer of power boilers with plants at Bridgeport and Cornwells, Pa., and Bound Brook, N. J., operating under a receivership, is being reorganized and will take out a State charter under the name of the Badenhausen Corporation, to manufacture boilers, tanks, superheaters, power and heating equipment. Application for the charter will be made on Aug. 7.

The Philadelphia Enameling Works, 1311 Vine Street, Philadelphia, has acquired property at 254 North Thirteenth Street, extending to 259-63 North Clarion Street, for extensions.

The N. & G. Taylor Co., 300 Chestnut Street, Philadelphia, has plans in preparation for a new power house at its tin plate works at Cumberland, Md., to include boilers, automatic stokers, coal-handling and ash-handling machinery, etc.

Louis J. Kolb, Tenth and Reed streets, Philadelphia, will build an automobile service and repair works, 56 x 90 ft., at 905-11 Watts Street. H. B. Welden, 10 South Eighteenth Street, is architect.

The Atlantic Elevator Co., Inc., Pennsylvania Building, and the Albro Clem Elevator Co., Erie and D streets, Philadelphia, manufacturers of elevators, have been consolidated under the name of the first noted company. The new organization will be capitalized at $1,020,000. B. F. Mechling, Jr., is president.

J. W. Vandegrift, Mervine and Cambria streets, Philadelphia, has awarded contract to Henry E. Baton, 1713 Sansom Street, for a two-story and basement mechanical maintenance and repair works, 111 x 226 ft., to include machine and other departments, estimated to cost about $200,000.

W. A. Breese, Philadelphia, has acquired the building, 100 x 150 ft., at Sixty-fifth and Media streets, with adjoining property, 68 x 100 ft., for an automobile service and repair works.

The Universal Service Motors Co., 1407 Locust Street, Philadelphia, has leased property at 1825-33 Market Street, 110 x 180 ft., for new branch works. Alterations and improvements will be made in the present building. The company will also commence the erection of a six-story addition to its plant at Seventeenth and Manning streets, 70 x 117 ft.

The Bureau of Water, City Hall, Philadelphia, has awarded contract to the Robbins Contracting Co., 1137 North Front Street, for the installation of coal and ash-handling equipment at the Queen Lane Pumping Station, to cost $68,350.

The Washington Plating Co., 28 South Seventh St., Philadelphia, manufacturer of plated wire, has leased a floor in the building at 141 North Third Street for extensions.

The Westinghouse Electric & Mfg. Co., Widener Building, Philadelphia, has awarded contract to the Consolidated Engineering Co., Calvert Building, Baltimore, for a ten-story factory and distributing branch, 95 x 191 ft., at Thirtieth and Walnut streets.

A vocational department will be installed in the new two-story junior high school to be erected on West State Street, Trenton, N. J., estimated to cost about $900,000. J. Osborne Hunt, 219 East Hanover Street, is architect. R. C. Belville, 9 South Stockton Street, is secretary of the school board.

The Pennsylvania Railroad Co., Broad Street Station, Philadelphia, has acquired seven acres on the Dillersville Road, Lancaster, Pa., from the Burnham Boiler Co. It will be used for new classification yards, freight houses, shops, etc., estimated to cost close to $250,000.

The Daniels Motor Car Co., Reading, Pa., is arranging to double the present plant capacity. George E. Daniels is president.

A cold storage and refrigerating plant will be erected in connection with the proposed meat-packing plant to be established at Bethlehem, Pa., by the Confederated Home Abattoirs Corporation, Portland, Me., estimated to cost close to $1,000,000, with machinery. The company is in negotiation with the Bethlehem Chamber of Commerce for a suitable site, and has opened local offices in the Odd Fellow's Building.

The W. L. Connell Coal Co., Scranton, Pa., has tentative plans for rebuilding its coal washery, known as the Enterprise Washery, at Kulpmont, Pa., destroyed by fire, July 15, with loss estimated at $30,000, including equipment.

The Topton Foundry Co., Topton, Pa., manufacturer of

iron and steel castings, etc., has work under way on a new one-story machine shop. Nathan Kline heads the company.

The Williamsport Building Products Co., Williamsport, Pa., care of Elmer Dittmar, 1603 Erie Avenue, architect, has completed plans for the erection of a new one-story factory, 57 x 160 ft.

The Harrisburg Light & Power Co., Harrisburg, Pa., has arranged for a bond issue of $44,000, the proceeds to be used for extensions and improvements.

The Harrison Safety Boiler Works-Cochrane Corporation, Seventeenth and Clearfield streets, Philadelphia, is completing the erection of a foundry, 160 x 352 ft., at Earnest Station, Norristown, Pa., to replace the plant destroyed by fire several months ago.

The W. S. Lehrman Pattern Works, Allentown, Pa., has removed its plant from 600 Turner Street to 15 North Church Street, where increased facilities will be arranged, including a department for experimental work in pattern design.

The Jordan Electric Co., Allentown, Pa., is being organized to conduct and operate an electric power plant and system in Heidelberg Township. Silas R. Rothermel, Allentown, represents the company.

The Standard Tank Car Co., Sharon, Pa., has plans in progress for an addition, 50 x 100 ft., estimated to cost about $70,000. It will be used for assembling.

Pittsburgh

PITTSBURGH, July 24.

A FAIR amount of new machine tool business is being closed, but the bulk of orders on which estimating has been going on for the past three or four months is held up by the coal and rail strikes. One interest states it has more prospective business on its books than at any time in three years, and expects to close most of it as soon as the strikes are settled. Inquiries all coming from coal operators whose mines are closed, and some of these will result in sales in the near future. There is also considerable inquiry from steel mills for heavy equipment, and from machine shops for lighter machine tools.

Prices are firm and most of the radial drill manufacturers advanced quotations the past week about 5 per cent. Makers of other machine tools state that with increased costs of fuel, higher labor and manufacturing costs, they will have to get more money for their tools. It is a fact, however, that when a good inquiry comes in, competition is very keen and usually low prices are named.

The only machine tool list which came out the past week was from the Pittsburgh Railways Co. and included two lathes, two drill grinders, two woodworking tools and a small bench drill.

The local office of the Shepard Electric Crane & Hoist Co. has sold to the Wheeling Bronze Casting Co. a 2-ton electric crane, and other equipment to the Greenville Steel Car Co., Greenville, Pa.

The Consolidated Light, Heat & Power Co., Huntington, W. Va., has plans for the erection of a $15,000 brick and steel building for which some new equipment will be needed.

The National Sanitary Co., Salem, Ohio, is planning to rebuild its works, recently destroyed by fire.

The General Refractories Co., Oliver Building, Pittsburgh, has acquired the plant and property of the Hayes Run Fire Brick Co., Orviston, Pa., Possession will be taken about Aug. 1. The company recently acquired the plant of the Pennsylvania Fire Brick Co., Beech Creek, Pa.

A vocational department will be installed in the new junior high school to be erected at Oil City, Pa., for which plans are being prepared by E. E. Bailey, Chambers Building, architect.

The Jones & Laughlin Steel Co., Ross Street, Pittsburgh, has filed plans for an addition to its Southside Works, East Carson Street, to cost about $50,000.

The Raymilton Refining Co., Raymilton, Pa., has plans under way for a new refinery at Mercer, Pa., to provide more than four times the present plant capacity. It is proposed to remove the latter refinery to the new location later.

The Citizens' Light & Power Co., Oil City, Pa., has arranged for a capital stock issue of $95,000, a portion of the proceeds to be used for extensions and improvements.

The Stroh Steel-Hardening Process Co., Westinghouse Building, Pittsburgh, with plant at Thirty-second Street and Allegheny Valley Railroad, has acquired the property of the Pittsburgh Knife & Forge Co., at Chateau Street and Ridge Avenue, consisting of brick buildngs on a site 68 x 100 ft., and will use it for extensions.

The Westinghouse Electric & Mfg. Co., East Pittsburgh, is arranging for the installation of shears and other equipment at its new tin works, now in course of construction at Trafford City, Pa.

The Greer & Laing Hardware Co., Wheeling, W. Va., is planning the erection of a new works at 1327 Main Street, to be five-stories, 90 x 137 ft., and estimated to cost about $150,000.

M. S. Hodges, Franklin, W. Va., has tentative plans for the organization of a company to construct and operate a hydroelectric generating plant and system on the Potomac River.

The Guyan Machine Shops, Logan, W. Va., have inquiries out for a new power boiler, 80 to 100 hp., also machine shop equipment, including band wheel, scroll saw with tilting table, etc.

The Warren Steel Car Co., Warren, Pa., manufacturer of tank cars, etc., has arranged for rebuilding a portion of its plant by day labor, replacing the structures destroyed by fire recently with loss of about $70,000. M. Mathis is general manager.

A vocational department will be installed in the addition to be erected at the Peabody high school, Highland Avenue, Black and Beatty streets, estimated to cost about $500,000. Edward B. Lee, Chamber of Commerce Building, is architect.

The Virginia Electric Co., Charleston, W. Va., formerly the Virginia Electric & Machine Works, has tentative plans for extensions and improvements in its power house and system. The company has recently increased its capital to $300,000.

The Wheeling Oxygen Co., 1130 Market Street, Wheeling, W. Va., has plans in progress for the erection of a new plant on Sixteenth Street, Warwood, W. Va. The Industrial Engineering Co., Park Building, Pittsburgh, is engineer. I. S. Scott is president.

A vocational department will be installed in the high school addition to be erected at Paw Paw, W. Va. C. R. White is secretary of the school board.

Baltimore

BALTIMORE, July 24.

The City Council, Easton, Md., has authorized plans for extensions and improvements in the municipal electric power plant, including the installation of turbo-generators and auxiliary equipment.

The Crown Cork & Seal Co., 1511 Guilford Avenue, Baltimore, has arranged for a bond issue of $4,000,000, a portion of the proceeds to be used for extensions and improvements. J. M. Hood, Jr., is president.

J. E. Moxley, Jr., Equitable Building, Baltimore, architect, has completed plans for a three-story automobile service and repair building, 42 x 125 ft., estimated to cost about $100,000. It will be owned and operated by M. S. Block, Baltimore.

The Northern Maryland Electric Co., Port Deposit, Md., is concluding arrangements for the purchase of the plant and property of the Port Deposit Electric Co. and will make extensions and improvements. To carry out the project, a bond issue of $85,000 is being arranged.

The Tin Decorating Co. of Baltimore, Boston Street and Linwood Avenue, Baltimore, manufacturer of metal specialties, has filed plans for the erection of a one-story addition, 23 x 137 ft.

The United Railways & Electric Co., Baltimore, is disposing of a note issue of $2,500,000, a portion of the proceeds to be used for power house extensions, betterments, etc. C. D. Emmons is president.

The City Council, Macon, Ga., will receive proposals at an early date for a municipal electric power plant.

A. L. Flint, general purchasing officer, the Panama Canal, Washington, will take bids until Aug. 8 for bronze seal strips, wire nails, bibb cocks, globe valves, yellow metal and other materials, for use in the canal zone.

The L. Rosenfeld Mfg. Co., 105 South Hanover Street, Baltimore, manufacturer of bakers' utensils and similar equipment, has filed plans for a new one-story factory, 46 x 147 ft. to cost about $17,000.

The Alexandria County Lighting Co. and the Arlington Electric Co., Alexandria, Va., has been merged as the Alexandria Light & Power Co., with capital of $650,000. It is planning for extensions and improvements in power plant and system.

A vocational department will be installed in the pro-

posed high school to be erected at Claymont, Del., estimated to cost $285,000. Bonds are being arranged and plans will soon be prepared.

George W. Koiner, Petersburg, Va., has organized a company to construct and operate a five-story and basement cold storage and refrigerating plant on Bollingbrook Street, totaling about 70,000 sq. ft. of floor area and estimated to cost in excess of $500,000, including machinery.

The Lincolnton Creamery & Ice Co., Lincolnton, N. C., is arranging to rebuild its ice-manufacturing plant, recently destroyed by fire with loss estimated at about $100,000.

A vocational department will be installed in the new three-story junior high school to be erected at Roanoke, Va., estimated to cost about $150,000. H. Courcy Richards, 608 Chestnut Street, Philadelphia, is architect.

Fire, July 15, destroyed the plant and machinery of the Union Box & Lumber Co., West Point, Va., with loss estimated at about $75,000. It is said that it will be rebuilt.

The Charleston-Anderson Motor Co., 106 East Bay Street, Charleston, S. C., recently organized, will establish a service and repair works. A local building has been acquired which will be remodeled. F. R. Baker is president.

The Pennsylvania Railroad Co., Baltimore, and the Norfolk & Western Railroad Co., Roanoke, Va., have commenced construction of their new joint engine terminal, with shop and repair facilities, at Hagerstown, Md. The structure will provide for about 40 locomotives.

G. C. White & Son, 406-8 North Fifth Street, Richmond, Va., are planning for the installation of a number of new machine tools.

Eugene F. Bates, Greenville, S. C., has awarded contract to the Fiske-Carter Construction Co., Greenville, for a two-story automobile service and repair building on College Street.

The Rocky River Power Co., Cumnock, N. C., is arranging a list of equipment for installation in its new hydro-electric generating plant.

Morris Brothers, Greenville, N. C., have tentative plans for a new plant to manufacture bobbins and other textile mill equipment. D. L. Morris is president.

The Alsop Motor Co., 918 West Broad Street, Richmond, Va., is planning for the installation of a lathe, drill press and other machine tools.

The Suffolk Coal & Ice Co., Suffolk, Va., recently organized with a capital of $50,000, has taken over the local ice-manufacturing plant of the Crystal Ice & Fuel Co., and plans for extensions and improvements. A. E. Harvell is president.

A vocational department will be installed in the new high school to be erected at Warrenton, Va. Smith & May, Calvert Building, Baltimore, are architects.

The Munn & Griffon Co., Rocky Mount, N. C., is planning for the installation of new refrigerating and cold storage equipment.

The Virginia Machinery & Well Co., 1319 East Main Street, Richmond, Va., is making inquiries for a steel cableway, about 200 ft. long and 1½ tons capacity.

Cleveland

CLEVELAND, July 24.

THE demand for machine tools fell off during the week and sales generally were limited to single tools. The possible effects of the coal and railroad strikes have caused some industrial concerns to delay placing orders and have also retarded railroad buying. Automobile and automobile parts manufacturers are still purchasing some equipment, but orders from this source were mostly for single machines. Sales by some local dealers during July will show a gain over June, owing to the fact that some fair sized orders which had been pending several weeks were placed this month. About 25 metal and wood-working machines for the Youngstown Board of Education, which have been hanging fire for some time, have been distributed among two or three dealers. Crane inquiries have improved somewhat, but orders are slow in closing. The Lima Locomotive Works, Lima, Ohio, will require several cranes for its proposed plant extensions.

Foundry operations in Ohio showed a slight gain July 1 over June 1, according to the monthly report of the Ohio State Foundrymen's Association. At present the foundries reporting are operating at slightly over 50 per cent of capacity. While the small shops are fairly busy many of the large shops are still operating at limited capacity, which accounts for the low average operations.

The Toledo Automatic Brush Machine Co., Toledo, Ohio, has been incorporated to manufacture machines for making brushes. It has a capitalization of $200,000 in preferred stock and 60,000 shares of no par common stock. It is stated that the men identified with the Kent Owens Machine Co. and the Owens Bottle Machine Co. are interested in the new organization. George P. Greenhalgh is president, and John R. Cowell, vice-president and general manager.

At a recent meeting of the stockholders of the Lima Locomotive Works, Inc., Lima, Ohio, refinancing plans for extensions were approved, the estimated cost of which is $1,500,000. Bids have been taken for an addition and the company is expected to buy considerable machinery. It is understood that it has prepared a list, but it has not yet been sent to the trade.

The Cleveland Folding Machine Co., 5200 Euclid Avenue, Cleveland, plans the erection of a two-story factory and warehouse, 96 x 180 ft., to cost approximately $100,000.

The Canton Malleable Iron Co., Canton, Ohio, is planning to enlarge its works by the erection of a building to be used for an annealing department.

The National Sanitary Co., Salem, Ohio, is preparing plans for rebuilding its factory, recently damaged by fire.

The Akron Bronze & Aluminum Co., Akron, Ohio, will add to its products the manufacture of fireless cookers.

The Standard Equipment Co., Lorain Avenue and West 106th Street, Cleveland, plans the erection of a forge shop, 60 x 200 ft.

New England

BOSTON, July 24.

THE city of Boston is asking quotations on one wet tool grinder, one 16-in. shaper and four 13-in. x 5-ft. screw cutting engine lathes, in addition to motor, anvil, tool-stand and vise equipment and a small list of wood-working machinery, for the Frank V. Thompson school. This is the largest individual inquiry put out the past week. The General Electric Co., West Lynn, Mas., is considering the purchase of one or two high priced single tools, more or less specialties. The Mead, Morrison Co., list, East Boston, for the production of tractors, is unfilled, and the Worthington Pump & Machinery Corporation has yet to purchase a 56-in. cold saw for its Cambridge plant, and the Boston & Albany Railroad a 90-in. wheel lathe and box facing and boring machine. Between 70 and 85 per cent of the other inquiries in the market are from small concerns, many of them new, about to engage in the manufacture of some special product. A small amount of metal-working equipment is involved in each instance. The leading New England industries are putting out few feelers on machine tools.

The largest individual sale the past week was two new 16-in. x 8-ft. lathes and 12 used machine-shop tools, including lathes, milling machines, planers, shapers and drill presses, to a Portland, Me., interest. Other sales included a new 6-ft. radial drill and an automatic tapping machine, costing approximately $1,300, to two textile companies; a new 16-in. x 8-ft. lathe and a used milling machine to a Portsmouth, N. H., firm; a used 6-in. gear cutter to a Connecticut maker of bag machinery; two 16-in. x 6-ft. new South Bend lathes to the New Bedford vocational school; a 14-in. x 6-ft. used standard lathe to a Vermont garage, and possibly a dozen small and lower priced lathes to Massachusetts and Maine garages. So far this month about 30 tools at the Bath shipyard of the Texas Co. have been sold to interests outside of New England, some of the machines being very large.

Prices on machine tools are steadier and general belief in the trade is that values will be marked up between now and fall.

Local houses reporting no sales of machine tools the past week have been compensated to some extent by an exceptionally good business in chucks, taps, dies, chasers, drills and other small tools. A New England car builder, recently taking on considerable repair work as a result of the strike,

the United Shoe Machinery Corporation, Boston, and paper cup manufacturers have been leaders in purchases of small tools, sales of which have far exceeded business booked in any previous week this year. The plumbing and fittings industries are large purchasers of threading tools.

The property of the Marine Engineering & Dry Dock Co. of Rhode Island, Allen's Avenue, Providence, will be sold in one lot at auction on Aug. 3.

The Salem Laundry Co., Lafayette Street, Salem, Mass., has awarded contract for a two-story and basement garage, 80 x 140 ft., to cost approximately $120,000.

Bids are in for a three-story, 40 x 50 ft. service station contemplated by Louis A. Blair, 27 Church Street, Cambridge, Mass.

Plans are being prepared for a water power development, including a 30 x 80-ft. power house, for the Salmon Falls Mfg. Co., Salmon Falls, N. H. Charles T. Main, 200 Devonshire Street, Boston, is the engineer.

Papers are being drawn for the organization of the Hartford Products Corporation, Hartford, Conn., capitalized for $100,000, to manufacture joints and automobile parts, and possibly brushes. Jarvis McAlpine Johnson, John F. Forward, C. M. Bigelow and Maj. Robert Woodbury are the principals.

The Hart & Hegeman Mfg. Co., Capitol Avenue, Hartford, Conn., manufacturer of electric light supplies, etc., will soon let contract for a four-story reinforced concrete addition, 52 x 181 ft. Greenwood & Noerr, 847 Main Street, Hartford, are the engineers.

The Sprague Meter Co., 203 Water Street, Bridgeport, Conn., is in the market for a used 34-in. squaring shear, for use on tin and sheet metal.

The Milford Electrolytic Iron Co., Milford, Conn., recently organized, is remodeling the factory of Page & Nettleton, recently leased and expects to start production in about two months. Laboratory equipment and new machinery will be required.

The Safety Car Heating & Lighting Co., Dixwell Avenue, Hamden, Conn., will shortly start work on a one-story brick addition, 106 x 115 ft., to its main factory. Another one-story building will also be erected, about 100 x 200 ft. Stovel & Brinckerhoff, New York, are the engineers.

Frederick L. Mills, 617 State Street, Bridgeport, Conn., will soon start the erection of a garage and service station, on the corner of State and Hansen Streets. It will be one-story, 54 x 100 ft.

In connection with general plant expansion and the operation of its new plant at Syracuse, N. Y., the Lamson Co., 100 Boylston Street, Boston, Mass., has filed articles of incorporation, under State laws, with a capital of $3,000,000, to manufacture pneumatic tube systems, pneumatic machinery and parts.

Frankel & Warshaw, 262 Atlantic Street, Stamford, Conn., are taking bids for the construction of a two-story automobile service and repair works, on State Street, with machine repair department, 85 x 90 ft., estimated to cost close to $50,000. S. Z. Levine, Gurley Building, is architect.

The Dawn Mfg. Co., Fairfield Avenue, Bridgeport, Conn., manufacturer of washing machines, is planning for the installation of new equipment. R. A. Leckie heads the company.

The Hygrade Lamp Co., Salem, Mass., is arranging for the immediate installation of equipment in its new four-story addition, 50 x 110 ft., now nearing completion. The extension will total 100,000 sq. ft. of floor space and will have a capacity of about 30,000 lamps daily.

The New Down Town Garage, Inc., Providence, R. I., is taking bids for an automobile service and repair works on Richmond Street, to include a machine shop. It will have a capacity of about 250 cars. William R. Walker & Son, Providence, are architects.

The Connery Machine & Tool Co., 4 Fisk Avenue, Springfield, Mass., has filed plans for a one-story addition, estimated to cost about $17,000.

The Eastern States Refrigerating Co., Springfield, Mass., with branch plants at Albany, N. Y., and Jersey City, N. J., has arranged for a bond issue of $1,500,000, a portion of the proceeds to be used for extensions and improvements.

The Central Railway of Vermont, St. Albans, Vt., is considering the installation of additional machine tools at its shops.

A vocational department will be installed in the new high school addition to be erected at Fairfield, Conn., estimated to cost about $160,000. O. C. S. Ziroli, Court Exchange Building, Bridgeport, Conn., is architect.

The Connecticut Light & Power Co., Hartford, Conn., is planning for the construction of a power dam and hydro-electric plant on the Housatonic River, in the vicinity of West Cornwall.

Detroit

DETROIT, July 24.

The Auto Specialties Mfg. Co., St. Joseph, Mich., manufacturer of automobile jacks, shock absorbers, etc., will take bids immediately for an addition estimated to cost about $100,000, including equipment. Davidson & Weiss, 53 West Jackson Boulevard, Chicago, are architects. J. W. Tiscornia is vice-president.

The Best Stove & Stamping Co., 145 East Atwater Street, Detroit, is planning for the installation of new pressing equipment.

C. H. Wills & Co., Marysville, Mich., manufacturers of automobiles, have established a branch plant at Sarnia, Ont.

The Par-Kar Coach Co., Detroit, manufacturer of automobiles, has acquired the plant of the Bollstrum Truck Co., St. Louis, Mich., for new works.

The Lincoln Motor Co., Warren and Livernois streets, Detroit, operated by the Ford Motor Co., Highland Park, Mich., is taking bids for a one-story addition, 250 x 800 ft. Improvements will be made also to present buildings. Albert Kahn, 1000 Marquette Building, is architect and engineer.

Officials of the Lorraine Motors Co., Beverly, Mich., are perfecting plans for the organization of a new company to take over and operate the plant for the manufacture of automobile parts and equipment. Plans for the manufacture of automobiles have been abandoned. J. L. Dornbos, Grand Haven, Mich., is secretary and treasurer in charge.

The Washtenaw Motor Co., Ann Arbor, Mich., is taking bids for a new automobile service and repair works, to cost about $75,000; 60 x 200 ft. Cuthbert & Cuthbert, 327 East Huron Street, are architects and engineers.

The Garber Machine Co., Bay City, Mich., is planning for the installation of new equipment in its machine shop and foundry.

The Packard Motor Car Co., Boulevard and Belt Line, Detroit, is having plans prepared for a one-story building, estimated to cost about $40,000. Albert Kahn, 1000 Marquette Building, is architect.

Buffalo

BUFFALO, July 24.

The Board of Education, 1401 Telephone Building, Buffalo, will take bids until Aug. 2, for vocational equipment for the public schools, including variety saw, grinder, lathes, motors, anvil, shearing machine, oven furnace and hoidall. The Associated Buffalo Architects, Inc., Delaware Court Building, 232 Delaware Avenue, are architects. James Storer is secretary.

Officials of the United States Light & Heat Corporation, Niagara Falls, N. Y., manufacturer of electric storage batteries, railroad car lighting equipment, etc., have organized the United States Light & Heat Corporation of California, as a subsidiary, to erect a branch plant at Oakland, Cal. Plans are being drawn and it is proposed to commence construction early in the fall.

The Endicott Forging & Mfg. Co., North Street, Endicott, N. Y., is planning for the installation of new tools and machinery.

The Beaver Products Co., Beaver Road, Buffalo, a subsidiary of the Beaverboard Co., has acquired the plants of the American Cement Plaster Co., Port Clinton, Ohio, and other points, the acquisition comprising 12 complete mills. The new owner will continue operations and plans a number of extensions and improvements.

The plant and property of the New Process Gear Corporation, 500 Plum Street, Syracuse, N. Y., a subsidiary of the Willys Corporation, will be offered at public sale on Aug. 22. The parent organization is now in receivership, and the disposition of this plant will complete the liquidation of the physical properties.

The Oneonta Battery Co., Oneonta, N. Y., has commenced foundations for a new two-story plant, 100 x 100 ft. A complete repair department will be installed.

The Great Lakes Dredge & Dock Co., Morgan Building, Buffalo, is planning for the installation of machine tools and other equipment in a repair shop on Katherine Street.

The Rectograph Co., Inc., 307 St. Paul Street, Rochester, N. Y., manufacturer of photographic equipment, is planning the erection of a new one-story plant, estimated to cost close to $20,000.

The Associated Motor Industries, Inc., Dayton, Ohio, recently organized, has closed the plant of the Covert Gear Co., Grant Street, Lockport, N. Y., one of the divisions of the

organization, pending the change in the local management and proposed improvements.

A vocational department will be installed in the new two-story high school, 146 x 150 ft., to be erected at Perry, N. Y., for which bids are being received until Aug. 2. Gordon & Kaelber, 125 Sibley Building, Rochester, N. Y., are architects. T. H. Donnelly is secretary of the local school board.

The Fonda, Johnstown & Gloversville Railroad Co., Gloversville, N. Y., operating an interurban line, is planning for the issuance of bonds for $550,000, a portion of the proceeds to be used in connection with extensions and improvements of electric plant and system.

The Erie Mop & Wringer Co., West Commercial Street, East Rochester, N. Y., plans the installation of additional machinery.

The Lautz Marble Corporation, 861 Main Street, Buffalo, has plans in progress for a new works, estimated to cost about $85,000. Equipment for cutting, grinding, polishing, etc., and conveying machinery will be installed.

Cincinnati

CINCINNATI, July 24.

EFFECTS of the coal and rail strikes are being felt in the machine-tool industry. Last week showed a falling off in the number of orders placed with local manufacturers, and the explanation advanced is that with a transportation tie-up in prospect placing of orders would be of little benefit to the purchaser. Some buying was done, however, and while the automotive industry continued as the leader, other lines took a greater number of tools than previously.

A Wisconsin truck manufacturer inquired for four machines for immediate delivery, and a local manufacturer who quoted three-weeks' delivery was informed that the machines had to be shipped on the day the order was received.

A local manufacturer booked some orders for export, including two machines for France and three for Australia. Canada is also increasing its purchases from this country, and a local builder is in receipt of a number of inquiries from Canadian houses for tools for shipment to other countries.

An inquiry from the Mexican Government was received during the week, but until the Obregon ministry is officially recognized it is not likely that much business will be done in that country.

Local dealers report a fair demand for small tools, and used equipment is also moving in better volume.

The Board of Education, Louisville, Ky., is asking bids on an addition to the vocational school, to cost about $50,000. It will be 26 x 176 ft., two stories, and will be equipped as an automobile mechanics' and electrical shop. Woodworking and printing departments will also be installed. Bids will close Aug. 4.

Milwaukee

MILWAUKEE, July 24.

ALTHOUGH the continuance of the strike has delayed to a marked extent the purchase of machine tools by railroads, it has speeded up buying by the automotive and other metal-working interests. Purchases, however, are for one or two machines for immediate delivery and no large lots are appearing. The railroad difficulties have not had as yet any material effect on deliveries, but the production situation is apprehensive of the effect of the miners' strike. Fuel supplies here are very low, replenishment has suffered further setbacks, and the outlook is alarming unless output of coal is resumed without further delay and deliveries from lower Great Lakes' ports are speeded up.

The Nash Motors Co., Kenosha, Wis., has let the general contract to Theodore Stark & Co., 130 Muskegon Avenue, Milwaukee, for a two-story brick and steel addition, 200 x 950 ft., to the four-cylinder car division works in Milwaukee. It will be equipped for general sheet-metal working processes and open body manufacture, including also a new administration building. The project represents an increase of about one-third capacity of the addition originally planned, due to the improved prospects in the passenger car manufacturing industry. The H. K. Ferguson Co., Cleveland, is architect and engineer. B. W. Twyman is general manager of the Milwaukee Nash works.

The Acme Gas Mixer Co., Superior, Wis., manufacturing carburetion and other gas engine specialties, is negotiating with the Association of Commerce of Stoughton, Wis., with a view of relocating its plant and offices. An option has been taken on an existing building. C. A. Peterson is president.

The G. R. & S. Motor Co., Appleton, Wis., has broken ground for a two-story garage and service building, 48 x 90 ft., at Morrison and Washington streets. The general contractor is Earl F. Miller, Inc., local. With equipment now being purchased the investment will be about $20,000.

The Waukesha Stanchion Co., Waukesha, Wis., is a new $20,000 corporation organized by Lews K. Wilson, Harry L. Horning and S. A. Perkins, and will establish a factory for the production of steel stanchions and other metal barn and dairy fixtures.

The Milwaukee Electric Railway & Light Co., Milwaukee, through its parent corporation, the North Amercan Co., has acquired the common stock of the Milwaukee Northern Railroad, a local and interurban electric line running northward from Milwaukee 60 miles. The new owner will immediately build about 25 miles of connecting lines, purchase several new passenger and express cars, and make other improvements, according to a statement by John I. Beggs, president and general manager.

The White Rock Mineral Springs Co., Waukesha, Wis.,, has engaged Henry C. Hengels, architect, 445 Milwaukee street, Milwaukee, to design a power plant addition estimated to cost about $25,000, including new boilers and other equipment.

The Kewaunee Mfg. Co., Kewaunee, Wis., manufacturer of laboratory furniture and fixtures, contemplates the erection of two additions, 40 x 112 and 24 x 108 ft., to the main factory, and a lumber tempering building with a capacity of 350,000 ft. It is overcrowded with orders from high schools, colleges, hospitals and commercial and industrial institutions for equipment which will require the maximum existing capacity until May 1, 1923. C. G. Campbell is general manager.

The Sanitary Novelties Co., Eau Claire, Wis., has been chartered with a capital stock of $25,000 to manufacture milk containers and other packages for foodstuffs. A factory will be equipped at once. The principals are J. E. Llewellyn, L. C. Zarbeck and F. J. Berg, all of Eau Claire.

The Mattefs Brothers Co., Antigo, Wis., has started work on a two-story brick and mill factory, 80 x 200 ft., and is inquiring for equipment for manufacturing hardwood novelties, toys, interior trim, etc. Later a dry kiln and warehouse will be erected, and it is planned to add a sawmill unit early in 1923.

The Heath Cedar Co., Marinette, Wis., has broken ground for a two-story addtion, 50 x 100 ft., to its factory at Sherman and State streets, and will install 12 additional woodworking tools for fabricating interior finish, silo material and other specialties. Individual electric motor drive is employed throughout the plant. Earl Heath is president and general manager.

The Consumers Lumber & Coal Co., Portage, Wis., has awarded contract to the Godfrey Mfg. Co., Elkhart, Ind., for the entire equipment of a new coal storage and handling plant.

The Middle Wisconsin Power Co., Madison, Wis., has been incorporated with a capital stock of $25,000 by C. W. Kernston, William J. P. Aberg and J. B. Sanborn, to build and operate electric light and power, gas and other public utilities. Other definite information is not available, but it is stated that construction of a hydroelectric generating plant is to be undertaken before the end of the year.

The Wisconsin Public Service Co., Green Bay, Wis., principal subsidiary of the Wisconsin Securities Co., 425 East Water street, Milwaukee, has acquired the entire properties of the Oshkosh, Wis., and the Menominee-Marinette Light & Traction Co. Improvements in both properties will be made. Plans for the Menominee-Marinette division include additional hydroelectric and steam generating equipment in the Menominee main station and construction of a transmission line from the High Falls line to the Grand Rapids hydroelectric station on the Monominee River near Menominee, Mich. Specifications for the Oshkosh gas plant improvement have not been completed. Clement C. Smith, Milwaukee, is president.

The movement undertaken by a committee of Milwaukee business men, headed by Clarence R. Falk, president the Falk Corporation, to secure the proposed American aircraft establishment of A. H. G. Fokker, Amsterdam, Holland, is maturing. A $100,000 fund has nearly been raised to finance a survey of aircraft transportation possibilities throughout

the country, as well as suitable sites in Milwaukee, with land and water facilities for terminal and manufacturing establishments. Mr. Fokker has returned to Holland but expects to come back to Milwaukee in about 60 days for further discussion with the committee. Francis A. Vaughn, consulting engineer, has been appointed director of the survey.

Indiana

INDIANAPOLIS, July 24.

The Highway Iron Products Co., Ligonier, Ind., manufacturer of structural steel products, culverts, etc., is arranging for the removal of its plant to South Bend, Ind., where a site has been selected for a new plant with considerably increased capacity. The company has recently increased its capital from $350,000 to $700,000 for expansion.

The Board of Sanitary Commissioners, City Hall, Indianapolis, is taking bids until July 31, for a new one-story power plant at the sewerage disposal works, to have a capacity of about 300 hp., and estimated to cost about $250,000, including machinery. Charles H. Hurd, 1405 Merchants' Bank Building, is engineer.

A number of electric light and power companies in Indiana are planning for the construction of new generating plants and systems, as well as extensions to present plants, including the Indiana Service Corporation, Fort Wayne, estimated cost $300,000; Indiana Power Co., Vincennes, $75,000; Wabash Valley Electric Co., $50,000; the Indiana & Michigan Electric Co., South Bend, $750,000; Indiana Utilities Co., Angola, $35,000; the Spencer Light, Power, Heat & Water Co., Spencer, $12,000; the Martinsville Gas & Electric Co., Martinsville, and the Washington Water, Light & Power Co., Washington, Ind.

The Zenite Metal Co., 201 North West Street, Indianapolis, has awarded a contract to the Service Construction Co., Indianapolis, for a one-story addition, 100 x 200 ft., on North West Street, estimated to cost about $100,000, including equipment.

The Louisville Cement Co., Louisville, Ky., is planning to rebuild the portion of plant at Speeds, Ind., destroyed by fire July 13, with loss estimated at about $350,000, including equipment.

The Central Indiana Power Co., Indianapolis, formerly the Merchants' Public Utilities Co., has arranged for a bond issue of $7,500,000, a portion of the proceeds to be used for plant extensions and improvements. Joseph H. Brewer is president.

A vocational department will be installed in the new two-story and basement high school to be erected at Salem, Ind., estimated to cost about $100,000, for which plans are being contemplated by Paul Moosmiller, Ninth and Market streets, New Albany, Ind., architect.

The Hydroelectric Light & Power Co., Connersville, Ind., will make extensions and improvements in its local plant and system to cost about $200,000.

The Central South

ST. LOUIS, July 24.

The Sedalia Light & Traction Co., Sedalia, Mo., has acquired property at Broadway and Ingram Avenue for a new steam-operated electric power house. Plans are being prepared for a building 100 x 100 ft., with installation to include electric generator, switchboard, boilers, automatic stokers, coal and ash-handling machinery, etc. It is estimated to cost approximately $350,000.

A vocational department will be installed in the new three-story and basement high school to be erected at Liberty, Mo., 140 x 190 ft., estimated to cost about $125,000. C. A. Smith, 602 Finance Building, Kansas City, Mo., is architect.

The Unity School of Christianity, Ninth Avenue, Kansas City, Mo., will commence the erection of a new three-story power house and machine shop, 50 x 60 ft., estimated to cost about $50,000. Elmer Boillot, 1202 Scarritt Building, is architect.

The Standard Underground Cable Co., Westinghouse Building, Pittsburgh, will proceed at once with the erection of its new plant at St. Louis, which has been held in abeyance owing to a strike in the building trades. The plant will cost in excess of $500,000 and is expected to be ready for the installation of machinery early in the fall.

The Carthage Superior Spring Bed Co., Carthage, Mo., has abandoned plans for the time being for the construction of its proposed new plant, estimated to cost about $40,000.

The City Council, St. Joseph, Mo., is arranging a bond issue of $300,000, the proceeds to be used for extensions and improvements in the municipal electric plant, including new machinery.

The Kansas City Power & Light Co., Kansas City, Mo., has arranged for a preferred stock issue to total $5,676,100, a portion of the proceeds to be used for extensions and improvements in power plants and system.

The Federal Cold Storage Co., 3003 North Broadway, St. Louis, recently organized with a capital of $550,000, will commence the erection of a new ice-manufacturing and cold storage plant. It will have an ice-making capacity of 300 tons a day, with refrigerating equipment of 1000 tons daily, and cold storage department to approximate 15,000 tons of space. P. D. C. Ball is president, and J. P. Kelly, manager.

The Haines & Noll Co., Wichita, Kan., an interest of the Haines Tile & Mantel Co., 152 North Market Street, is planning for the installation of equipment in a building to manufacture belting, shafting, hangers and other transmission apparatus.

The Wonder State Crystal Co., Little Rock, Ark., recently organized, has plans under way for the establishment of a plant to manufacture radio equipment. John Thornburg is president, and T. A. Wright, secretary.

The Rex Auto Specialty Co., 630 North Main Street, Wichita, Kan., is planning for the installation of machine tools, etc., to manufacture automobile equipment.

The Central Power & Light Co., Pocahontas, Ark., has arranged for an increase in capital from $2,500,000 to $5,000,000, a portion of the proceeds to be used for power plant extensions and improvements.

The Empire District Electric Co., Joplin, Mo., will install a new 10,000-kw. turbo-generator at its power plant at Riverton, Mo., to replace present equipment, including new auxiliary machinery, estimated to cost close to $300,000. It will make other extensions and improvements in its plants and system, with the total expenditure in excess of $1,000,000.

A vocational department will be installed in the new junior high school to be erected at Sapulpa, Okla., estimated to cost about $175,000. Jewell Hicks, West Main Street, Oklahoma City, Okla., is architect.

The Tennessee Eastern Electric Co., Johnson City, Tenn., is arranging for a preferred stock issue of $600,000, a portion of the proceeds to be used for extensions and improvements in power plants and system.

The Henry Vogt Machine Co., Tenth Street and Ormsby Avenue, Louisville, has plans in preparation for a new three-story and basement building, 50 x 80 ft., estimated to cost about $40,000. It manufacturers ice-making and refrigerating machinery.

The Louisiana & Arkansas Railway Co., Texarkana, Ark., is taking bids for a one-story locomotive repair shop, 130 x 286 ft.; forge shop, 60 x 80 ft.; power house 17 x 35 ft.; and a number of other structures at Stamps, Ark. The installation will include 24-in. slotter, 60-in. wheel lathe, 48-in. boring machine, flat turret lathe, 48-in. car wheel borer, 24-in. shaper, double car wheel press, 4-ft. radial drill, 2500-lb. steam hammer, forge upsetting machine, bolt heading upsetting machine, 18-in. lathe, and other miscellaneous tools. Three electric traveling cranes, each about 90 tons capacity, and 65-ft. span, will be installed, as well as two 100-kw. electric generators and auxiliary equipment. Harrington, Howard & Ash, Kansas City, Mo., are consulting engineers. C. G. Lunday is vice-president and general manager.

The Kansas Gas & Electric Co., Wichita, Kan., will make extensions and improvements in its power plants and system to cost about $2,000,000.

The Gulf States

BIRMINGHAM, July 24.

The Columbia Fence & Wire Co., Dallas, Tex., is planning for the erection of an addition, 200 x 212 ft., on adjoining plot recently leased.

The Rule-Jayton Cotton Oil Co., Stamford, Tex., has acquired about 21 acres as a site for a new cotton oil mill, estimated to cost $150,000.

Fire, July 10, destroyed the power house and saw mill of the Deal-Powers Lumber Co., Vance, Ala., with loss estimated at $50,000, including equipment. It is planned to rebuild.

The Mayhew Produce Co., Brady, Tex., has preliminary plans under way for a new cold storage and refrigerating plant.

The Missouri, Kansas & Texas Railroad Co., St. Louis, has awarded a contract to the Mount Vernon Bridge Co., Kansas City, Mo., for its new locomotive shops at Bellmead, Tex., at a cost of $642,000, exclusive of equipment. The main shop will be 222 x 475 ft., with capacity of 16 engines; a number of smaller structures will be built and

with equipment will represent an investment in excess of $1,000,000.

The Hill City Mfg. Co., Tallahassee, Fla., recently organized, has secured a local building and will operate a pant to manufacture automobile tire rims and other metal specialties. George V. Stein heads the company.

The Texas Utility Co., Lubbock, Tex., will proceed with the immediate erection of additional units at its new electric generating plant, following the completion of the first section, which was placed in service July 13. A number of power lines will be constructed. The entire project is estimated to cost in excess of $250,000.

The American Ice Co., Dallas, Tex., will commence the erection of an ice-manufacturing plant on local site. All equipment will be electrically driven and a power house will also be established.

The Todd Shipyards Corporation, Mobile, Ala., has work under way on extensions and improvements at its shipyard, and expects to have the plant ready for service early in the fall. The yard will be devoted to repair operations. Headquarters of the company are at 25 Broadway, New York.

The City Council, Melville, La., is planning for extensions and improvements in its municipal electric power plant to cost about $40,000.

The Guidry Brick Co., Lafayette, La., is planning for enlargements to double, approximately, the present capacity. A. Guidry heads the company.

The Alabama Saw Mill Co., Magazine, Ala., is planning to rebuild the portion of its plant recently destroyed by fire with loss estimated at about $50,000, including machinery.

A vocational department will be installed in the new high school, 98 x 106 ft., to be erected at Newberry, Fla. Plans have been prepared. T. M. Bryan, Gainesville, Fla., is architect.

The Dillingham Ice Cream Co., Breckenridge, Tex., will build a new ice and cold storage plant, with capacity of about 65 tons per day.

The City Commission, Lakeland, Fla., has plans under way for the installation of additional equipment at the municipal electric power plant.

Fire, July 15, destroyed a portion of the distributing plant of the Magnolia Petroleum Co., Beaumont, Tex., with loss estimated in excess of $1,000,000, including stock, buildings and equipment.

The Forsechler Wagon Mfg. Co., New Orleans, has plans under way for a new two-story factory, 60 x 150 ft., estimated to cost $25,000, including equipment. Paul Andry, 840 Gravier Street, is architect.

The City Council, Vero, Fla., has plans in preparation for the enlargement of the municipal electric light and power plant, estimated to cost $40,000, including equipment.

The Consumers Ice Co. Tampa, Fla., will call for bids early in the fall for a new ice-manufacturing plant. Equipment will be electrically driven. Clyde Perry is manager.

The Electric Motor Co., 114 South Franklin Street, Tampa, Fla., has plans under way for an addition. A list of equipment is being arranged.

Canada

TORONTO, July 24.

A SLIGHT improvement in the machinery market was noted last week and sales were heavier than for the two or three preceding weeks. Prospective buying for the early future looks promising, according to the inquiries being received, and it is the general opinion that a good demand for practically all lines of equipment will appear in the early fall, providing the coal strike in the United States has no serious effect on manufacturing operations this side of the border. Notwithstanding that United States railroads have been entering the market for equipment and rolling stock, nothing of this nature has developed in Canada, and it is pointed out that the various railroads in the Dominion are well supplied with equipment and that rolling stock is in good order.

The automotive industry is still buying some equipment, and dealers look for more activity from this source as soon as some of the plants under construction are nearer completion. Foundry and general iron working tools have been backward for some time, but improvement in these lines has recently been reported and prospects for the future are good. Municipal governments are entering the market for equipment for waterworks, sewage, electric and incinerator plants and companies handling these lines are busy. Woodworking tools are in active demand. Equipment for pulp and paper mills is also being purchased freely and in the past two weeks several announcements have been made of arrangements to build additions and new pulp and paper mills.

Small tools have taken another turn for the better and manufacturers and dealers report good business.

C. N. Tingle, secretary-treasurer, Hanna, Alta., will receive bids until Aug. 7 for the supply and installation of one 100-kw. generator and exciter, direct connected to a compound steam engine to be erected in the power house, one 50-kw. similar unit, two 150-hp. return tubular or water tube boilers and accessories, including mechanical stoker, switchboard and street lighting equipment, transformers and copper wire.

The Town Council, Alvinston, Ont., plans the erection of a pump house and installation of electrically operated pumps. John Irving is clerk.

The Fort William Paper Mill Co., Mission street, Fort William, Ont., will erect a mill there at a cost of $300,000.

John Gray, Collingwood, Ont., has organized the Georgian Bay Spring & Metal Co., and will specialize in the manufacture of springs for motor car and other industries.

The Lion-Mead Rubber Co. has secured an option on six acres at Wrightville, Que., where it proposes to erect a plant for the manufacture of tires, tubes and Mead valves. When in full operation it will employ between 300 and 500 men.

The planing and woodworking mill owned by McCullough Brothers, Debert Station, near Truro, N. S., was totally destroyed by fire with loss to building and equipment estimated at $35,000.

The Pacific Coast

SAN FRANCISCO, July 18.

The Southern California Ice & Cold Storage Co., San Bernardino, Cal., has plans for a new four-story ice-manufacturing and cold storage plant on Third Street, estimated to cost about $135,000, including machinery. Harold E. Jones, Katz Building, San Bernardino, is architect.

The Mariposa Mining Co., Bagby, Cal., is planning to rebuild its power house near Bagby, destroyed by fire, July 14. An official estimate of loss has not been announced.

D. D. Duncan & Co., 239 South San Pedro Street, Los Angeles, manufacturers of sash, doors, etc., are preparing plans for a new one-story factory, 107x136 ft., on Fifty-eighth Street. O. M. Warner, 220 Stimson Building, is architect.

The Consumers Ice & Cold Storage Co., 801 D Street, Sacramento, Cal., has plans under way for extensions and improvements to cost about $25,000.

The Three Lakes Lumber Co., Three Lakes, near Everett, Wash., is reported to be arranging to rebuild its saw mill and lumber plant, destroyed by fire July 11, with loss estimated in excess of $500,000, including machinery, power equipment, etc.

The Murphy Timber Co., Banks, Ore., is planning to rebuild its electrically-operated mill, recently destroyed by fire with loss estimated at about $300,000, including equipment.

The Standard Oil Co. of California, 200 Bush Street, San Francisco, is planning for the construction of a new distributing plant at Santa Paula, Cal.

The Northern Pacific Railroad Co., St. Paul, Minn., is planning the erection of a new electric power house at Glendive, Mont., to cost about $125,000.

The Economic Mfg. Co., Sacramento, Cal., manufacturer of piston rings, etc., has leased property at 115-17 Broadway, Oakland, Cal., for a new plant and will remove to the new location. F. M. Moore is president.

The Southern California Edison Co., Los Angeles, has made application to the city officials, Long Beach, Cal., for permission to build a new power house on West Third Street. Plans are being prepared.

The Cameron-Hogue Lumber Co., Portland, Ore., has plans under way for rebuilding the portion of its mill recently destroyed by fire, with loss estimated at about $40,000.

Fire, July 15, destroyed the building occupied by the Acme Pattern Works, Puget Sound Mfg. Co., and the Puget Sound Metal Works, Tacoma, Wash., causing a loss estimated at about $50,000.

NEW TRADE PUBLICATIONS

Ovens.—Paul Maehler Co., 2210 West Lake Street, Chicago. Booklet, 33 pages, 10¾ x 7½ in. Describes and illustrates the company's ovens, all of which are built sectional with the exception of small portable and muffle types. Several pages are devoted to the construction of the standard unit which includes assembling or setting up. Gas heated ovens, including indirect types, are described and specifications and dimensions given. Electrical heat and its adaptation to the ovens is outlined and includes electric heater and control equipment. A section is devoted to conveyor and special type ovens and other sections to core ovens, oven accessory and other equipment. The booklet is profusely illustrated, many views of actual installations of various types of equipment being included.

Ball Bearings.—Nice Ball Bearing Co., Nicetown, Philadelphia. Loose-leaf booklet, 4 x 7½ in., 40 pages, gives sizes, specifications and list prices of various types of the company's ball-bearings, which include the annular type, turned cone, not-ground, single and double, combination types and thrust types. Ball bearing, flat type and diamond ball retainers, ball bearing sheaves and wheels are also included. Discounts in effect as of April 15 are given.

Welding Rods & Electrodes.—Page Steel & Wire Co., Monessen, Pa. Catalog 500, devoted to Page-Armco welding rods and electrodes, giving the history and manufacture of Armco iron and various industries that use welding rods and electrodes. The illustrations include various products welded by the company's materials. Several pages are devoted to useful information, metric conversion tables, weights and measures, decimal equivalents, comparisons of wire gages, etc.

Oil Engines.—Charter Gas Engine Co., Sterling, Ill. Catalog No. 22, 56 pages, 7¾ x 10¾ in., describes and profusely illustrates the company's type "R" oil engine. The type is large and the photographic reproductions unusually adequate. Several pages are devoted to describing the details of construction with several views and cross-section views of various parts of the mechanism. Illustrations include various designs in which the engine is built and several pages are given to testimonial letters, each letter having reproductions of photographs of machines using the engines described in the catalog.

Flexible Couplings.—Thomas Flexible Coupling Co., Warren, Pa. Booklet, 14 pages, 8½ x 11 in. The company's flexible couplings for main mill drives, for heavy-duty reversing mill drives and for other service are illustrated and described, the illustrations including actual installation. What is said to be the world's largest flexible coupling, having a capacity of 10,000 hp. at 100 r.p.m. and weighing 14 tons, is shown connecting a motor to 132 in. plate mill at the Brier Hill Steel Co. Sectional views, a partial list of users, and specifications sheets, are included.

Lock Washers.—Reliance Mfg. Co., Massillon, Ohio. Catalog No. 6, 32 pages, listing various types of lock washers, both in plain and positive patterns and giving tables of washer widths, thicknesses and sizes for bolts and machine screws. For convenience, the washers are furnished in various assortments in packages of different sizes and also in a display case containing an assortment.

Boring Mills.—Colburn Machine Tool Co., Cleveland. Bulletin B-103, 12 pages, devoted to a description of the company's new heavy-duty boring and turning mills. Each unit of the mechanism is clearly described and illustrated and a phantom view of the machine shows the oil circulating system. The manipulation of the single-lever control for both feed and rapid traverse is illustrated.

Internal Grinder.—The Garvin Machine Co., New York. A four-page booklet describing and illustrating the Bright Internal grinder, a vertical spindle machine for the accurate grinding of straight round holes on a production basis.

Magnetic Chucks.—O. S. Walker Co., Inc., Worcester. Circular W-2, 16 pages, describes the company's rectangular, swiveling and vertical face type, magnetic chucks, showing various views of the chuck assembled and disassembled and in use on grinding machines. Sections are devoted to the company's improved demagnetizing switch and also to direct-current generator and demagnetizer. Specifications and dimensions of the various units included.

Gears.—Boston Gear Works, Norfolk Downs, Quincy, Mass. Catalog No. 40, 1922, 128 pages, 3½ x 6 in. Lists the various types and sizes of gears carried in stock which includes spur gears in brass, iron and steel, worm, mitre, bevel, and also spiral gears. Sprockets and steel chains are included as well as annular ball bearings and other material. Steel and iron internal gears for use with the company's new style pinion of less than 12 teeth, are also included.

Spur Gear Cutting Machines.—Newark Gear Cutting Machine Co., Newark, N. J. Catalog No. 3, 40 pages, 6 x 9 in. General information as to the operation and construction, the drive mechanism, cutter speeds and feeds, patented centralized control, indexing mechanism and other features of the machine are given at length in first part of the catalog. Other pages illustrate and give specifications of various sizes of machines, the company's No. 1 gear cutter grinding machine and the gear cutters in stock being also described and illustrated. A page is devoted to the company's gear hobbing machine for helical and herringbone gears. Many useful tables are given. The machines are classified as gear cutting machines, but are intended also for cutting sprockets, ratchet wheels, circular saw teeth and other work requiring automatic milling of this nature.

Sheet Mill Equipment.—Erie Foundry Co., Erie, Pa. Bulletin No. 90, illustrating and describing its improved line of sheet mill equipment, including galvanizing machines, leveling machines, cooling wheels, pickling equipment, acid and storage tanks and squaring shears.

Resistance Thermometry.—Brown Instrument Co., Philadelphia. Catalog which explains the theory of resistance thermometry and the various types of instruments which operate on the basis of electrical resistance, favoring accuracy and rapidity, especially for small ranges of temperature.

Steel Sash.—David Lupton's Sons Co., Philadelphia. Catalog 11 containing 191 pages and profusely illustrated with half-tones and line drawings, completely describes and shows in use, sash for all types of buildings, corrugated wire glass, shelving, bookstacks, partitions and general factory equipment. Details of construction of buildings equipped with steel sash with dimensions and illustrations of factories, power houses and other buildings so equipped are given, as well as detailed description of the sash itself, illustrated with sectional views and cross section drawings of the most suitable types of factory construction for the elimination of smoke and dust and clear ventilation.

Centrifugal Pump.—Bulletin No. 23 of the Goulds Mfg. Co., Seneca Falls, N. Y., describes the newest addition to its line of pumps, a steam turbine-driven centrifugal pump.

Broach Handbook.—The American Broach & Machine Co., Ann Arbor, Mich., has published a handbook for the purpose of placing information on broaching, broached fittings and standard broachings, their use and care, before engineers, superintendents, draftsmen, purchasing agents and others interested in broaching operations.

Power Press Attachments.—The V. & O. Press Co., Glendale, Long Island, N. Y., Bulletin No. 6-B, which covers automatic attachments for V. & O. presses.

Track Specialties.—The Track Specialties Co., 29 Broadway, New York. Booklet illustrating and describing its line of "Trasco" devices, which include practically everything for steam and electric railroad tracks.

Wiring Devices.—The Weber Electric Co., Henry D. Sears, general sales agent, 80 Boylston Street, Boston. Illustrated booklet of 104 pages covering a large line of electric wiring devices.

Trane Data.—The Trane Co., vapor heating equipment, pumps, etc., La Crosse, Wis. This seventh edition of bulletin 11 has 24 pages, 6 in. x 9 in., printed in three colors and is filled with information, tables and blueprints relating to this application of low pressure steam heating systems. It illustrates also a number of heating specialties manufactured by the Trane Co.

Lighting Data.—Edison Lamp Works of the General Electric Co., Harrison, N. J. Additional bulletins of a series being published to cover eventually all phases of the lighting problem "Effect of Color on Walls and Ceilings on Resultant Illumination," "Fundamentals of Projection" and "The Lighting of Small Stores" are the titles. Out-of-date bulletins in the series are being replaced constantly by revised issues, and the researches of one kind and another have been thoroughly worked up, are accompanied by diagrams and illustrations and are full of information of interest to users of artificial light.

Boiler Feed Water Regulator.—Northern Equipment Co., Erie, Pa. A 20-page illustrated booklet, 8 in. x 11 in., covering boiler feed control in general and describing the Copes system of control. The subject has been treated in a way to cover the subject of boiler feed water regulation completely and yet very briefly. Free use has been made of graphical methods of presentation: charts showing the effect of feed water regulation on water input, steam output, feed water temperature, etc., also other charts, photographs, etc., are used.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossbile to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

	Per Lb.
Bars:	
Refined iron bars, base price	2.73c.
Swedish bars, base price	7.00c.
Soft steel bars, base price	2.73c.
Hoops, base price	3.78c.
Bands, base price	3.38c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	2.83c.
Channels, angles and tees under 3 in. x ¼ in., base	2.73c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	2.73c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	2.83c.
Toe-calk, ½ x ⅜ in. and larger	3.50c.
Cold-rolled strip, soft and quarter hard	6.25c. to 7.25c.
Open-hearth spring steel	3.50c. to 6c.
Shafting and Screw Stock:	
Rounds	3.35c.
Squares, flats and hex	3.85c.
Standard cast steel, base price	12.00c.
Extra cast steel	17.00c.
Special cast steel	22.00c.

Tank Plates—Steel

¼ in. and heavier	2.83c.

Sheets

Blue Annealed	Per Lb.
No. 10	3.78c.
No. 12	3.83c.
No. 14	3.88c.
No. 16	3.98c.

Box Annealed—Black

	Soft Steel C. R., One Pass, Per Lb.	Blued Stove Pipe Sheet, Per Lb.
Nos. 18 to 20	4.00c. to 4.30c.	.....
Nos. 22 and 24	4.05c. to 4.35c.	4.60c.
No. 26	4.10c. to 4.40c.	4.65c.
No. 28	4.20c. to 4.50c.	4.75c.
No. 30	4.45c. to 4.75c.	.....

No. 28 and lighter, 36 in. wide, 10c. higher

Galvanized	Per Lb.
No. 14	4.30c. to 4.60c.
No. 16	4.45c. to 4.75c.
Nos. 18 and 20	4.60c. to 4.90c.
Nos. 22 and 24	4.75c. to 5.05c.
No. 26	4.90c. to 5.20c.
No. 27	5.05c. to 5.35c.
No. 28	5.20c. to 5.50c.
No. 30	5.70c. to 6.00c.

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.
½ in. Butt..	—56	—40
¾ in. Butt..	—61	—47
1-3 in. Butt..	—63	—49
3½-6 in. Lap.	—60	—46
7-8 in. Lap..	—56	—34
9-12 in. Lap.	—55	—33

Wrought Iron	Black	Galv.
¾ in. Butt..	—30	—13
1½ in. Butt..	—32	—15
2 in. Lap....	—27	—10
2½-6 in. Lap.	—30	—15
7-12 in. Lap.	—23	— 7

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	3.50c. to 3.75c.
Annealed soft	3.50c. to 3.75c.
Galvanized annealed	4.25c. to 4.50c.
Coppered basic	4.00c. to 4.25c.
Tinned soft Bessemer	5.50c. to 5.75c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	17¼c. to 18 c.
High brass wire	18¼c. to 18½c.
Brass rod	15¼c. to 16¼c.
Brass tube, brazed	24¼c. to 25 c.
Brass tube, seamless	20½c. to 21 c.
Copper tube, seamless	22¾c. to 24 c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 21¼c. to 22¼c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14-20	
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	Primes	Wasters
		80 lb..	$6.05 $5.80
		90 lb..	6.15 5.90
		100 lb..	6.25 6.00
IC..	$10.00 $8.50	IC..	6.40 6.15
IX..	11.50 10.00	IX..	7.40 7.15
IXX..	13.00 11.25	IXX..	8.40 8.15
IXXX..	14.25 12.50	IXXX..	9.40 9.15
IXXXX..	16.00 14.00	IXXXX..	10.40 10.15

Terne Plates

8-lb. coating, 14 x 20

100 lb.	$7.00
IC	7.25
IX	7.50
Fire door stock	9.00

Tin

Straits, pig	33½c.
Bar	40c. to 44c.

Copper

Lake ingot	15¼c.
Electrolytic	15 c.
Casting	14¾c.

Spelter and Sheet Zinc

Western spelter	7¼c. to 7¾c.
Sheet zinc, No. 9 base, casks	8½c. open 9c.

Lead and Solder*

American pig lead	6¾c. to 7c.
Bar lead	8c. to 8½c.
Solder, ½ and ½ guaranteed	25c.
No. 1 solder	23½c.
Refined solder	20¼c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	75c.
Commercial grade, per lb.	35c.
Grade D, per lb.	25c.

Antimony

Asiatic	6½c. to 7c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	25c. to 27c.

Old Metals

Business was not active this week but values are generally unchanged. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	11.75
Copper, heavy wire	11.25
Copper, light and bottoms	9.00
Brass, heavy	6.25
Brass, light	5.25
Heavy machine composition	8.50
No. 1 yellow brass turnings	6.25
No. 1 red brass or composition turnings	7.75
Lead, heavy	4.50
Lead, tea	3.25
Zinc	3.25

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Problems in Localized Case Hardening

Low Carbon Machine Steel Used—After Carburization and Annealing, Material to Be Removed Machinable and Not Distorted in Subsequent Hardening

BY R. A. MILLHOLLAND

IN the problem of localized case hardening the manufacturer often confronts losses incurred through experimental expense and defective results.

Localized case hardening, as the writer uses the term, is the production of case hardened parts that have certain areas which from necessity or for reasons of subsequent machining operations must be kept in a machinable state. A characteristic example taken from the writer's experience is to be found in the manufacture of master collet hoods for screw machines. This part is a member of a screw machine which fits on the end of a screw machine spindle. Into it is forced the collet nose employed to grip the stock. It is readily seen that this hood must be accurate or the collet will not chuck the stock concentrically. For many obvious reasons this part must be hardened and ground to obtain the best results.

The method that would be usually employed would be to finish the hood with allowance for the usual grinding and chasing the thread before hardening. This method, however, is poor practice and leads to many difficulties. The principal ones are: Distortion of the thread lead and the added expense of lapping threads that shrink in hardening.

One of the Problems Stated

Since it was predetermined that the hoods were to be hardened, it was decided that the hoods be made of low carbon steel and afterward case hardened to a depth of about 3/32 in. The case-hardening method was decided upon because it was cheaper to machine the hood from a soft steel and also because localized case hardening could be employed.

In making the first hoods the usual mistake was made; that is, the hoods were machined, allowing stock for grinding, and the threads were chased before hardening. Right there the trouble started, for after the hoods were hardened and ground to size, it was found that some of the threads had shrunk and considerable expense was experienced in lapping in order to fit the gage. Other threads expanded and the parts were a total loss. In still another case the lead of the thread changed so badly that lapping was impractical and these pieces were also a loss. It became very evident that the cost of manufacture was excessive, and, coupled with the excess expense, it was found that no two hoods would chuck a test bar alike even when the same collet was employed. This lack of uniformity was alarming, and after considerable experimental expense the trouble was found in the distortion of the threads.

Once having established the cause, the remedy was the next step. Strange as it may seem, this was not as easy as it now appears. Several methods were available; one was to quench the nose of the hood and leave the thread soft, but this was discarded, as it gave unsatisfactory results. Another method was to use clay packing or copper plate on the thread diameter and not chase the thread until after hardening; but in spite of all that could be done hard spots showed up that made the threading operation too expensive, and even with the utmost care the hard spots affected the lead to such an extent that fault showed up when the test bar was chucked and indicated. Finally the solution to the difficulty came by the process of elimination, and the following method was employed with splendid results and with a minimum manufacturing expense:

Method Employed

The hoods were machined in the regular way except that on the threaded diameter there was left ¼ in. of stock and on the back face ⅛ in. of stock and the threading operation was omitted until after the carburizing operation. The hoods were then sent to the heat-treat department and the proper penetration of carbon was given with no attention being paid to localizing the carbon. After the hoods were properly carburized they were allowed to cool in the pots and therefore were in the annealed state and quite machinable. In this soft state the hoods went back to the machine shop, and the carburized area on the thread diameter and the back face of the hood were turned off. This turning operation removed all the high carbon steel on the thread area, and when the hoods were subsequently heated and quenched the thread area remained soft and quite machinable, while the remainder of the hood was as hard as could be desired.

The grinding of the hoods was purely a mechanical operation, the accuracy of which was controlled to a nice point. After the grinding operations, the hoods were chucked, indicated for concentricity, and the threads were chased in the soft machine steel without difficulty. This was possible because it is a well-known fact that low carbon machine steel does not harden perceptibly at the temperature which hardens the outer case of a high carbon content. Needless to say the result was a very uniform product with unsurpassed accuracy and interchangeability.

How a Second Problem Was Met

Another case that came to the writer's attention afterward was handled on the same plan and gave perfect results with no experimental expense. A large fixture required a number of long parallel strips that had to be hardened and ground. These strips were lo-

cated with dowel pins and held in place with filister head screws, the threads being in the strips.

In the light of past experience it was readily seen that if the strips were drilled and tapped before hardening that distortion of the strips in hardening would throw the alinement of the hole in the strips out of relation to those in the body of the fixture. With this in mind the tool room was ordered to make the strips from low carbon machine steel of about 0.10 to 0.20 per cent carbon and to send them to the heat-treating department before drilling and tapping in place. Instructions to the heat-treating department were that the strips were to be carburized to the proper depth and allowed to cool in the pots. This left them in the soft state, and upon being returned to the tool room, the carburized area on the bottom side of each strip was machined off and plainly marked to that effect. The strips were again sent to the heat-treating department and hardened. This method left the side of the strips that was faced to the fixture dead soft and readily drilled and tapped. The strips were then ground, assembled in place, drilled, tapped and reamed for dowel pins without the slightest difficulty. The result was very satisfactory because the holes in the strips matched perfectly with those in the body of the fixture and precluded the possibility of poor alinement due to changing of the relation of the holes in hardening.

The application of this method of localized case hardening is very wide, but the method involved applies to them all. Saving is effected in many ways; namely, using low-priced steel as compared to the cost of high carbon non-shrinking steel, lower machining costs and elimination of losses from breakage or distortion in hardening.

Stainless Steel in Mining

A paper on "Stainless Steels" was presented at the summer meeting of the Institution of Mining Engineers at Sheffield, England, by Dr. W. H. Hatfield, head of the Brown-Firth Research Laboratories. The London *Ironmonger* gives this summary:

The author asserted that the mining industry has not taken the best advantage of the development in steel metallurgy during the last 40 years. The industry is based on mild steel, and from a commonsense point of view probably it is right. But in the development of armaments, aircraft, automobiles and many other present day applications of steel, there has arisen a series of steels having much greater strength coupled with a considerable and sufficient ductility, which might be applied in different directions in the mining industry.

There are many items which could economically be manufactured of stainless steel, for instance, boiler fittings, pump rods, pump cylinder liners, valve parts for steam, water or air, impeller blades, rotary pumps, fan blades, pins for lifting apparatus, hooks, shackles and pins for coal conveyers, weighing machine parts and gauze for safety lamps. Wire ropes made from stainless steel are costly, but they have a definite application under certain conditions. Experiments have been carried out with rustless ropes, and he thought that shortly such ropes will be used in collieries. Springs are being manufactured successfully from rustless material.

International Conference of Cost Accountants

The preliminary program of the third international cost conference to be held under the auspices of the National Association of Cost Accountants in Atlantic City, Sept. 23 to 28, inclusive, lists the following among the subjects for discussion: "Actual Costs as Compared with Replacement Costs," "Sales and Administration Costs," "Standards as a Means of Reducing Costs," "The Place of Costs in Business Management," "Cost Problems of Specific Industries—Steel and Textile Industries."

The National Association of Cost Accountants has 20 chapters in different cities in the United States and Canada, and one recently established in Hawaii.

Drop Forging Meeting in October

The American Drop Forging Institute will hold a convention in Detroit on Oct. 3, 4 and 5, concurrently with the convention of the American Society for Steel Treating. It is planned to hold two joint sessions of the two bodies.

A few months ago the institute and the former American Drop Forge Association joined forces, all members of the latter body becoming automatically members of the institute until July 1. At that time they were given an opportunity of becoming either associate or executive members of the institute according to their eligibility.

Executive members are those whose principal drop forging business is the manufacture and sale of drop forgings to other than affiliated companies, while associate members comprise those who manufacture drop forgings chiefly for their own use. Associate members join with the executive members in regional group meetings held periodically to consider matters of common interest to all producers of drop forgings for whatever purpose, as well as in the annual convention. Executive members in addition meet five times a year to consider questions primarily of interest to the commercial forger only.

It has been decided that all producers of drop forgings will be asked to participate in the October convention on exactly the same basis as active members of the institute. With the added attraction of the concurrent proceedings of the American Society for Steel Treating and the international steel exhibition the largest attendance of any drop forging convention is expected.

New Switches for Electric Tool Handles

Two new types of compact electric tool and appliance switches have been brought out by the Cutler-Hammer Mfg. Co., Milwaukee. One, designated as the No. 7037 switch, is of the momentary-contact type for installation in the handle of such tools as drills. It is placed so that when the tool is gripped the forefinger rests on the trigger pressure which turns on the current. A return spring causes the trigger to return to the "off" position so that when the grip is released the switch automatically cuts off the current. Long phosphor-bronze contacts of generous proportions and a wiping motion are features intended to add to the serviceability of this equipment.

When the Grip Is Released the Switch Automatically Cuts Off the Current

A No. 7039 switch having a different form of operating lever with no return spring has also been developed for use in vacuum cleaners and similar appliances where the switch is to remain in the "on" or "off" position until moved to the other.

Boston pig iron interests have organized as the Iron Monger League, Puritan Chapter, with E. Arthur Tutein, president; J. O. Henshaw, vice-president, and W. J. Lavelle, sales manager New England Coal & Coke Co., secretary and treasurer. The chapter held its initial outing on Wednesday, July 19, at the Winchester Country Club, Winchester, Mass., as guests of Mr. Tutein.

Anti-Friction Bearings in the Steel Mill

Development of Ball and Roller Bearings—Considerations Affecting Their Use—Advantages and Disadvantages

BY A. M. MAC CUTCHEON*

ELIMINATION of friction has always been a most fascinating study in all branches of engineering. The use of rollers under a block of stone was known to the ancient Egyptians. Wheels used on chariots marked the first development in changing rolling friction, between the ground and the weight, to rubbing friction in an axle. Crude ball bearings were first considered about 1862 to 1870, the Patent Office files showing several patent applications at about this time. But the first practical applications came in the early nineties, with the use of the cup and cone bearings on bicycles.

Indeed, the history of the anti-friction bearing is closely identified with the development of the bicycle and the automobile. This industry furnished the stimulus for intensive effort toward the production of a bearing more general in its application.

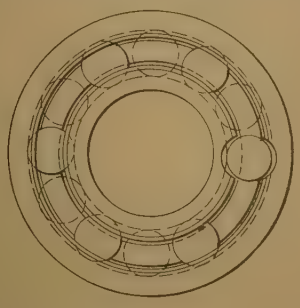


Fig. 1. Slot Assembly of Balls

The first type of annular or ring ball bearings was developed about 1901, based upon investigations made by Professor Strybeck. The annular bearing consists of two independent concentric rings, of practically rectangular section, and with grooved raceways in the outer surface of the inner ring and the inner surface of the outer ring. In this groove a row of balls is placed, and the whole is a self-contained, non-adjusting bearing. It was recognized that, theoretically, the annular bearing should contain as many balls as the space permitted. The number of balls which may be introduced into any bearing is intimately connected with the method of assembly, which will be discussed in greater detail under the various types of bearings. One method, with a slot in the side of the bearing, permits the maximum number of balls, but breaks the continuity of the race, and usually necessitates a shallower groove.

In another method, the Conrad patent, the introduction of the balls takes place by means of an eccentric displacement of the rings in relation to each other. The number of balls which may be introduced is limited, but the raceway is continuous and deep grooves may be used.

One type of bearing, which has been very largely used, was developed with a roll not solid but made up of a spiral. Considerable difficulty was experienced with the misalinement, and the consequent stresses not anticipated in the design. In 1906 a native of Sweden invented a two-row annular bearing with a self-alining feature, which it was claimed eliminated the sensitiveness to misalinement. Another claim for the double-row bearing is the increased number of balls which may be introduced in such a bearing.

In 1905 the first commercial application of annular ball bearings was made in America, although these bearings had been previously used abroad. The application was on a marble polishing machine for the Empire City Iron Works, in Long Island, and proved satisfactory. At about the same time, ball bearings were first applied to electric motors, and the two electrical manufacturing companies who were the pioneers in the use of ball bearings for motors are still using them.

In 1905 ball bearings were being favorably considered by the automobile industry, and during that year they were applied to the transmission of a 50-hp. Thomas flyer. In 1906, an Apperson car, built for the Vanderbilt Cup race, had its transmission so equipped. In 1910 one machine tool company exhibited at Atlantic City and elsewhere a vertical spindle drill press mounted on ball bearings, which drove a 1½-in. drill through 31 in. of cast iron per minute, and a 3½-in. drill through 11½ in. of metal per minute. This, of course, meant a very heavy end thrust on the bearings. Also, in 1910, ball bearings were used to take the thrust on belted vertical milling machines.

It is interesting to know that ball bearings have been used, also, on power punch presses, where there is undoubtedly a very heavy shock condition. The claim is made that, on such a press, the use of anti-friction bearings decreased the idle stroke power 54 per cent and the working stroke power 20 per cent, and that the power saving for the complete cycle was 40 per cent. Nineteen hundred and ten marked another interesting application of anti-friction bearings to a cold saw, which ran at 4100 r.p.m. Plain bearings had required renewal about once in three weeks, with consequent shutting down of the machine. Twenty hp. was required to drive the saw when equipped with oil type bearings, and water cooling was employed. After the change in the bearings, a 7½-hp. motor was substituted for the 20-hp., and there is no evidence of further bearing trouble.

Fig. 2. Conrad Eccentric Assembly of Balls

In the catalog published by one anti-friction manufacturer is listed a bearing ½-in. outside diameter and weighing a few ounces, while the largest is over 19 in. outside diameter and weighs approximately 300 lb. Special large radial bearings have been made by this company, having an outside diameter of 32¼ in. and a bore of 15¾ in. This bearing, fitted with 34 balls 4¼ in. in diameter, has a total weight of 1000 lb. and will carry a weight of 80 tons at 100 r.p.m.

Many types of anti-friction bearings are being manufactured, to some of which reference has already been made. A classification, with examples of each type, is given, but the information is not complete.

1.—BALL BEARINGS

(a) Annular type with deep grooves, balls assembled by eccentric displacement of the races.

Hess Bright Ball Bearing Co.
Fafnir Ball Bearing Co.

*Chief designing engineer, Reliance Electric & Engineering Co., Cleveland. Abstract of a paper read before the Association of Iron and Steel Electrical Engineers.

(b) Annular type with balls assembled through filling slots, permitting of a large number of balls.

Standard Roller Bearing Co.

(c) Annular type with balls assembled by expansion of the outer race under heat, permitting of a large number of balls.

Gurney Ball Bearing Co.

(d) Annular type with a double row of balls, permitting of a larger number of balls.

New Departure Ball Bearing Co.

(e) Annular type with a double row of balls and self-alining features.

S K F Ball Bearing Co.

2.—ROLLER BEARINGS

(a) Self-contained, with the inner and outer races forming a cage for the rolls; rolls assembled through filling groove.

Rollway Roller Bearing Co.

(b) Semi-flexible spiral roll assembled between end cages, and with the outer and inner races slipped over and within the rolls, permitting easy disassembly, but not capable of taking end thrust.

Hyatt Roller Bearing Co.

(c) Tapered rolls assembled between end cages, and with tapered races, permitting easy disassembly, taking end thrust, and making possible adjustment for wear.

Timken Roller Bearing Co.

Practically all types of ball and roller bearings are assembled with end cages, which maintain the proper relation in position of the ball and rolls. The proper design of these end cages is as necessary as the proper design of the rest of the bearing.

Manufacture

This is a highly specialized industry requiring special machinery, special materials and special operation. All bearings must be subjected to rigid inspection and test. The three most important properties which a finished anti-friction bearing should possess are (1) high fatigue limit and strength; (2) high resistance to shock; (3) highest possible resistance to wear.

Each bar of steel used in the manufacture of balls or rolls and races is tested. The steel must possess in the highest degree the qualities of hardness, toughness, durability after hardening and resistance to shock. The best balls are made of chrome alloy steel and carefully heat treated. They are hardened clear through, which makes the steel tough and less liable to crack under excessive load. They must be as spherical as it is possible to make them. The best grade balls are ground to size within 0.0001 in., an accuracy necessary to secure uniformity in size, and consequent even distribution of the load. The manufacture of a ball involves eleven main operations, as follows:

1.—Inspection and testing of steel stock.
2.—Forging or pressing in dies into rough spheres.
3.—Annealing to eliminate internal strain.
4.—Rough grinding.
5.—Second heat treatment; the balls are hardened, and then drawn, to toughen the steel.
6.—Second rough grinding to a fairly smooth surface, and more accurate spherically, but still considerably oversize.
7.—Precision grinding with fine grade wheels and heavy oil holding an abrasive in suspension.
8.—Final grinding in Hoffman machine, in which the balls are ground to within a small fraction of the finished size.
9.—Polishing balls in a tumbling barrel.
10.—Burnishing the balls, by which the surface is polished to a mirror finish.
11.—Final inspection and test for hardness, sphericity and size.

The balls are gaged with special machines calibrated with special care, and by the use of an instrument with which it is possible to determine the size to an accuracy within 0.00005 in. The same care is exercised in the manufacture of the races. One bearing manufacturer considers it necessary to manufacture his own steel, because of the exacting specifications. The steel tubes of which the races are manufactured are formed by forcing a pointed steel tool through the entire length of a steel bar, which results in a tube free of welds, laps or seams, and which has a uniform strength and texture on its entire circumference. The tubes are finally cold drawn to size, within a very close limit.

Selection of Anti-Friction Bearings

If anti-friction bearings are applied to motors, close co-operation is essential between the motor manufacturer and the ball bearing manufacturer. Several years ago the electrical engineer of an eastern railroad advised selecting a bearing two sizes larger than indicated by a consideration of the load which the bearing was expected and guaranteed to carry. He attributed the entire absence of trouble on car lighting outfits to the following of this plan.

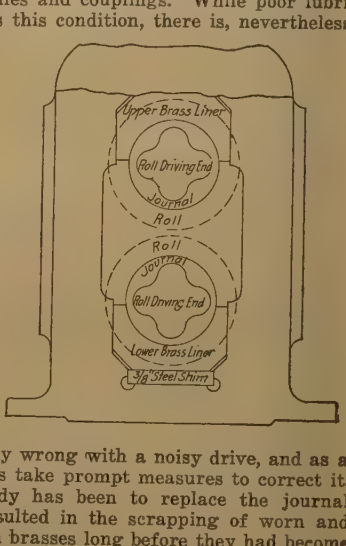
In justice to the manufacturer of the anti-friction bearing it should be stated that, since that time, exhaustive study has been made of the requirements of anti-friction bearings applied to motors, so that they are in a far better position to-day than at that time to specify the safe working load for the bearing. From many sources information has been received that, if the bearing is selected large enough and properly applied, no failure will result. This undoubtedly is an extreme view, but is interesting as evidence of the confidence which some users of anti-friction bearings have in this type.

(To be continued)

Saving Rolling Mill Brasses

BY M. E. DUGGAN

Worn journal brasses often cause rolling mill spindles to drop at the roll end below the level of the power end. When this occurs, considerable friction results in the spindles and couplings. While poor lubrication aggravates this condition, there is, nevertheless,



A ⅜-In. Steel Shim in Place at Bottom of Housing

something radically wrong with a noisy drive, and as a rule mill operators take prompt measures to correct it.

A usual remedy has been to replace the journal brasses, which resulted in the scrapping of worn and even slightly worn brasses long before they had become unserviceable.

A steel riser block placed under each liner, as shown in the sketch, will help to keep the rolls up to pretty near the normal level line, thus eliminating much of the friction. These blocks or plates can be made in sets varying in thickness from ⅜ in. up, thus getting all possible wear from the brasses. The roll can be raised and lowered with the traveling crane by means of a sling under the bottom roll.

The Southington Hardware Co., manufacturer of hardware, screws, etc., Southington, Conn., at its annual meeting last week, elected the following officers for the coming year: James H. Pratt, president; William E. Smith, secretary; and F. M. Gridley, treasurer. The directors chosen were: Ex-Governor Marcus H. Holcomb, Charles Hopkins Clark, Cyrus C. Chamberlain, Bradley H. Barnes, William E. Smith and W. P. E. Vierning.

The Norwalk Iron Works, South Norwalk, Conn., and the Automatic Carbonic Machine Co., Peoria, Ill., have combined, the new organization to have a capitalization of $1,500,000. C. L. Thompson of South Norwalk, will become president. Each company shall continue manufacture of machinery as previous to the merger. This includes oxygen and hydrogen compressors, air compressors and refrigerating machinery, both for ammonia and carbonic acid gas.

Factors in Oil Burning Using Cold Air*

Study of Different Conditions of Air Supply with Comparisons of Cost—Regenerative Furnaces and Steam Boilers Not Considered

AIR for use in oil burning practice is divided into three general classes: *A*, volume air at pressures below 12 oz.; *B*, positive air at pressures of 12 oz. to 2 lb.; *C*, compressed air at pressures above 2 lb.

Velocity when discharging against atmospheric pressures and temperatures is shown to be approximately 70 ft. per sec. at 1 in. water pressure, and on the basis that four times the pressure will double volume, the velocity at 1 lb. pressure is approximately 350 ft. per sec. and at 80 lb., 3200 ft. per sec.

Velocity has two general functions in oil burning: To atomize the fuel, and to induce the greatest amount of atmospheric air consistent with good burner, setting and furnace design.

Velocity for Atomizing by Air

Good atomizing by air action with satisfactory combustion conditions may only be secured with fuel having viscosities below 300 sec. on a Saybolt viscosimeter, and consequently burner and setting design must be premised on air pressure that will produce satisfactory combustion speeds.

Laboratory results indicate that the speed of backfire with a hydrogen-air mixture and at atmospheric temperature and constant pressure is approximately 14 ft. per sec. Under the same condition the backfire speed of the liquid hydrocarbons is probably not over 5 ft. per sec., but heating the air-oil column entering the combustion chamber by radiant heat accelerates backfire speed and with a hot furnace backfire speeds may exceed 100 ft. per sec., although the most desirable speed appears to be 60 to 70 ft. per sec.

The velocity from mechanically delivered air is greatly in excess of desirable combustion velocities, and the intitial velocities must be broken down as rapidly as possible, this being accomplished by atomizer, setting, combustion chamber and furnace design.

Quantities of Air Required for Burning Fuel Oil

For perfect combustion 1250 to 1700 cu. ft. of air per gal. of fuel are required. The lower figure applies to the lighter oils; the higher to the heavier oils.

Excess air is the source of one of the greatest fuel wastes, but 5 to 10 per cent excess air should mark the maximum limit in oil burning practice. Proper design of atomizer, setting and furnace and the installation of the most suitable equipment in part will greatly assist in reducing the excess air waste.

The author showed graphically in his paper what may be anticipated in percentage of induced or aspirated air with good atomizer and furnace design. The induction property of air under the *A* classification is shown to be small, averaging about 33 per cent, while under the *B* classification it is more than 50 per cent, and with high pressure air under the *C* classification it should be over 80 per cent, approaching 90 per cent of the total air required.

Comparison of Blowers for Delivering Air

The author discussed at some length the general characteristics of blower types ordinarily employed in oil burning and criticised the use of the fan type blower chiefly on account of the inability of blowers of this type to maintain a constant pressure at constant speed against varying air delivery openings, and further, because of the lack of atomizing properties of air at low pressure, a premium must be paid for a selected fuel that will produce satisfactory operating conditions.

The displacement type blower operates at constant speed and maintains constant pressure. This type blower is criticized chiefly because a change in the delivery areas at the burners is not reflected in the energy required for operation. A relief valve is ordinarily employed on blowers of this type and at constant speed they require constant energy due to the fact that the machine operates at substantially constant volume by the action of relief valve.

The turbine type machine in operation maintains constant speed and constant pressure against variable volume, and the energy varies almost directly with the volume and consequently only that energy required to move the air plus the machine constant is actually used.

A piston compressor operating at the initial pressure of 15 lb. is an excellent type of machine and the cost of an equal volume of air is less than 25 per cent of the cost of air compressed initially to 80 lb. Either the 15-lb. or the 80-lb. compressor, due to the effect of the unloader, absorbs energy only in an amount proportional to the amount of air actually needed plus the machine constant and the air is furnished at substantially constant pressure.

Comparative Cost of Air

A table of the author's gave in condensed form the results of the study completed in detail as to 13 different sets of conditions.

On an assumed requirement of 1500 cu. ft. air to burn a gal. of oil, this shows that under the *A* classification 1125 to 825 cu. ft. of air are required per gal. of fuel, while under the *B* classification 825 to 480 cu. ft. of air, and under the *C* classification 210 to 180 cu. ft. must be supplied from the mechanical air mover per gal of fuel burned and further that with electric current at 2c. per kwhr., the power cost of supplying air for 1000 gal. of fuel burned varies: $2.70 to $1.75, with air under the *A* classification; $1.75 to $2.50 under the *B* classification, and $1.50 to $6.66 with air under the *C* classification.

No account is taken of the cost of piping various systems, as each layout offers problems which cannot be generalized.

Conclusion

Consideration of the study shows that the proper method of burning oil is with air under *B* classification or with 15 lb. air under the *C* classification. The conclusion drawn in the paper may be applied with slight modifications to the combustion of pulverized fuel. The study covers specifically only the burning of liquid fuel in such industrial furnaces as use cold air, and no attempt has been made to touch the conditions existing in regenerative or recuperative furnaces or steam boilers. In its complete form the study has thirteen charts, bearing on various factors and essential to a complete consideration of the paper.

The labor situation in the eighth federal reserve district is reflected in the compilation by the Federal Reserve Bank of St. Louis from reports received from 200 leading employers in 20 of the largest cities in the district. The number of employees of the reporting interests increased 12,498 or 10.3 per cent (men increased 10.9 per cent while women increased 7.5 per cent) between June 30, 1921, and June 30, 1922. On June 30, 1921, the number was 23.2 per cent under normal and on May 31, 1922, the total was 17.7 per cent under normal as compared with 15.3 per cent on June 30, 1922. Wages figures on a semi-monthly basis, increased 0.3 per cent. The average per worker appeared to be $81.90 per half month on June 30, 1921, and $74.45 on June 30, 1922.

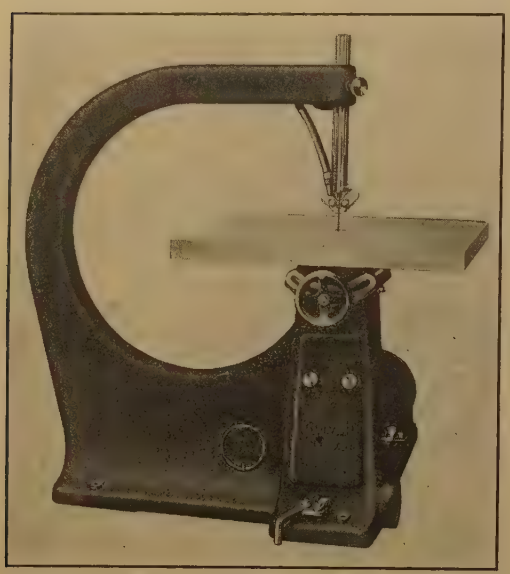
*Abstract of paper read by W. C. Buell, Jr., president Buell-Scheib-Mueller, Inc., consulting and combustion engineers, Pittsburgh, before the Engineers Society of Western Pennsylvania, June 6. Copyrighted, 1922, by W. C. Buell, Jr., and the Engineers Society of Western Pennsylvania.

Self-Contained Jig Saw

A new self-contained jig saw which represents a departure from the usual design in that there are no overhead belts, no moving parts unguarded and no tension in the saw blade, has been brought out by the Oliver Machinery Co., Grand Rapids. It is primarily adaptable to pattern and other woodworking shops for interior and exterior scroll work on wood, although it may be used on other material.

The new machine, designated as the No. 173, is shown in the illustration. Operated from the front the capacity is up to 36½ in. between the saw and the column. With the saw turned at 90 deg. and operated from the side, work of almost any length or practical width may be handled. The highest work accommodated under the guide is 10 in. The stroke of the saw blade is 3 in., and saws up to 18 in. may be used.

Moving parts of the machine are adequately guarded and the saw blade not being under tension, a broken



New Jig Saw Machine in Which There Are No Overhead Belts, No Moving Parts Unguarded and No Tension in the Saw Blade

blade would be unlikely to cause an accident. Saw blades are conveniently removed and replaced. The clamping device below the table is automatic and the sliding block in the upper guide-way is intended to provide a rapid and convenient means of inserting the saw. Absence of overbalance load is a feature of the new design and is said to assure a quiet running, vibrationless operation and better work.

The machine may be either belt or motor driven, being a self-contained unit in both cases. Bearings and movable parts are made to compensate for wear. The pitman and cross head are of aluminum and complete control of the machine is by means of a conveniently located foot lever.

The table is 39 x 34 in. and is of cast iron. It is mounted on rockers to tilt 30 deg. to right or left and it may be locked in any position by means of a clamp screw and hand wheel provided. When direct-motor drive is employed a flexible coupling connects the shaft and motor.

Two saw guides are provided, one above and one below the table, and these may be turned to permit sawing from either the front or side. A slide dumping device is provided in the table in front and around the saw, with the knob on the under side. This may be drawn back to permit small cuttings to drop through the table and out of the way.

An air blast, by which a continuous flow of air is directed to the front of the saw, is included in the new design.

New Line of Polishing Machinery

A new line of ball-bearing polishing and buffing machinery, two units of which, a single and a double spindle lathe, are now available, is being brought out by the Mitchell Engineering Co., Springfield, Ohio.

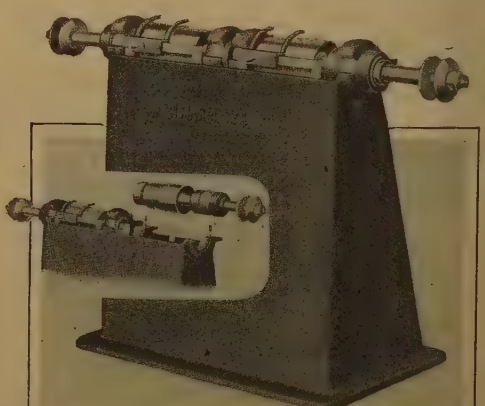
The double spindle lathe, known as the No. 5, is shown in the accompanying illustration. It has two independent spindles which permit the stopping of one without interfering with the other. Another feature is the ball bearing mounting of the spindle, each spindle having three ball bearings and each loose pulley two. Either or both spindles, together with the bearings, may be removed by releasing the bearing-housing clamps and removing the spindle assembly, a ball and socket feature being included to assure perfect alinement.

The machine may be driven from overhead or underneath. The ends of both spindles are drilled and tapped for taper points. The spindles are 2 in. in diameter the full length, except where the wheels are mounted, and the length of each spindle is 32 in., the length of both being 66 in. overall. The distance between wheels is 57 in.

The distance from the tight flange to the side of the machine is 10½ in., but can be longer or shorter as required. The machine will take wheels 2½ in. thick. The height from the floor to center of spindle is 38 in. and size of base at the floor is 26 by 42 in. The weight is 950 lb. net.

A No. 5 machine arranged for motor drive is also available and in this design any wheel speed is obtainable regardless of the motor speed. In this arrangement any standard motor may be mounted in the base of the machine, and the spindles driven by belts. The spindles are started and stopped independently of each other by means of a ball-bearing equipped belt tightening device operated by a hand lever.

The No. 6 machine is a single spindle unit, the spindle being mounted in four ball bearings and the



Double Spindle Ball-Bearing Polishing and Buffing Lathe. The insert shows the manner of mounting spindles with bearings assembled

loose pulley in two. In this case also the spindle, together with the bearings, may be removed by releasing the bearing housing clamps, the ball and socket feature being also included. In this machine the spindle is 48 in. long overall and the distance between wheels 39 in. The size of base at the floor is 20 by 26 in., and the net weight 600 lb.

Samuel T. Freeman & Co., 1519 Chestnut Street, Philadelphia, auctioneers, will sell at public auction on Aug. 7 at their salesrooms at this address 1742 tons of chill cast forging ingots and 33,405 lb. of finished and rough turned forgings.

The United States Nickel Co., New Brunswick, N. J., manufacturer of shot and ingot nickel, has resumed operation at its plant in New Brunswick.

NEW ELECTRIC FURNACE

Induction Type Developed by General Electric Co. for Melting Non-Ferrous Metals

The General Electric Co. has recently developed and operated for several months an induction type furnace which is particularly adapted to melting non-ferrous metals. It possesses several important features not previously found, it is claimed, in induction furnaces, and calculated to extend greatly the field of application.

The melting chamber, in which the charge is received, melted, and held for pouring, resembles an ordinary crucible, with inclosed top. It has a charging door on one side and a pouring spout on the other. There is also a door in the cover which may be used for

75-Kw. Repulsion Induction Furnace for Non-Ferrous Metals

charging or as a vent when melting oily scrap or other material producing smoke or fumes.

Distinct from this chamber, but communicating with it through ports or ducts, is another chamber in the form of a hollow cylinder encircling a primary winding and one leg of a laminated iron core. Molten metal in this cylindrical chamber constitutes the secondary of a transformer, and the heat in the furnace is generated by the secondary current which flows around the cylinder, through the resistance of the molten metal, when alternating voltage is applied to the primary winding.

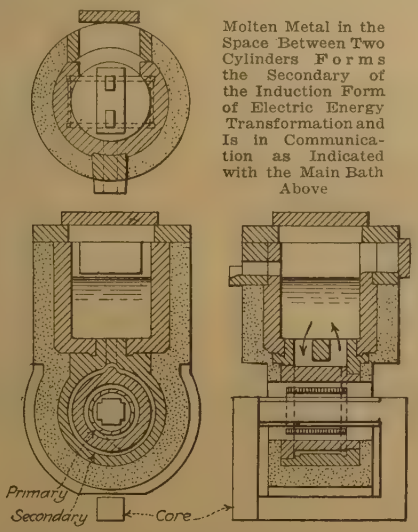
The secondary chamber, with its associated primary and core, is located beneath the melting chamber, partly for compactness of design, and partly because this position is favorable for maintaining a full secondary with a small residual charge in the melting chamber after pouring. This serves to insure uniform power input and uniform rate of heating.

A positive unidirectional circulation between the melting chamber and the heating chamber (secondary) constitutes a feature in this furnace. It is found to result in uniform composition of metal and uniform temperature throughout the bath. This feature has particular value in the melting of finely divided metal, such as borings or light scrap, since the molten material is continually washing against it.

This circulation is effected by the magnetic force of repulsion, which exists between primary and secondary in the transformer. The axial displacement of the primary relative to the secondary causes the fluid pressure due to this force to be greater at one end of the secondary cylinder than at the other. The molten charge flows from the end under higher pressure to the melting chamber, with a return flow from the chamber to the other end of the cylinder, as indicated by the arrows in the drawing. The strength of the circulation may be changed, if desired, by shifting the axial position of the winding.

The refractory lining for this furnace is constructed of three preformed and prefired parts, which are assembled with cemented joints in the furnace. This, in itself, is considered a radical improvement in furnace design, making for a durable lining, and when necessary to replace it, for doing so in short time and little expense. This construction has the advantage of permitting the inspection, before assembly, of all parts of the lining, with special attention to the surfaces which come in contact with molten metal. The lining is surrounded, in the furnace, by layers of heat insulating material which, together with the compact design of the furnace, reduce the radiation losses to a minimum.

When starting the furnace it is necessary to prime it with sufficient molten metal to fill the secondary and give a depth of 2 or 3 in. in the melting chamber. The furnace is therefore at its best when operating continuously, on the same kind of metal, as a residual charge must be retained from the previous heat for starting a new one. When melting intermittently, as for day work only, or for a few heats per day, the residual charge must be kept in a molten condition between heats by applying a low voltage sufficient to supply the radiation losses only. If it is desired to change the metal or alloy which is melted, this may be done by emptying the furnace completely and pouring



Molten Metal in the Space Between Two Cylinders Forms the Secondary of the Induction Form of Electric Energy Transformation and Is in Communication as Indicated with the Main Bath Above

in a priming charge of the new metal which has been melted in some other furnace, or, if it is desired merely to change the percentages of the constituents in the alloy, this may be done by adding an increased percentage of one or more of the constituents to correct the proportions of the residual charge.

The furnace, although of recent development, has been used on red and yellow brass and on copper with, it is stated, pronounced success. Future development is expected to extend the field of application to other metals both ferrous and nonferrous.

For yellow brass the furnace illustrated has a total holding capacity of 1200 lb., with a pouring capacity of 750 lb. The full pouring capacity of 750 lb. can be melted and poured each hour with an input of 75 kw., thus giving a power consumption of not more than 200 kwhr. a ton for brass. For intermittent operation this energy consumption is, of course, increased by the power necessary to supply the radiation loss during standby periods, which is about 10 kw. The power factor on a 60-cycle circuit is about 75 per cent, varying somewhat with the composition of the metal to be melted. The metal loss is almost negligible, being put at less than 1 per cent for yellow brass having a composition of 60 per cent copper and 40 per cent zinc, and

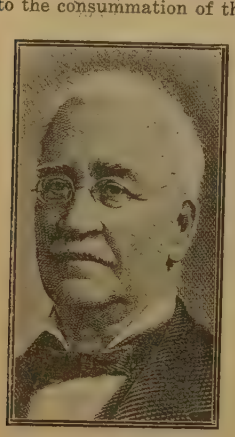
still less for such metals as have higher copper content.

This furnace will be built in two forms, which are practically the same except for the tilting mechanism and method of tilting. The furnace proper, which is the same in both forms, is mounted on a strong steel frame or yoke, which is provided with trunnions supported in bearings on pedestals. In the form here illustrated, the trunnions are so located at opposite ends of the yoke that the furnace tilts around a line approximately through its center of gravity, the pouring spout moving forward and down. In this form of the furnace, the tilting is accomplished by means of a hand wheel suitably geared to the trunnions. In the other form, the trunnions are located on a line passing through the pouring spout, so that in tilting there is no motion of the spout. This type of furnace is used when it is desired to pour directly from the furnace into molds. In this form of the furnace the tilting is accomplished by means of a motor, which is controlled by a standard drum switch.

Rolling Mill Equipment Merger Is Completed

Mackintosh-Hemphill Co., A. Garrison Foundry Co., Pittsburgh Iron & Steel Foundries Co. and Woodard Machine Co. Now a Single Corporation with Capital of $6,500,000

PITTSBURGH, July 31.—Official announcement has been made of the merging of the Mackintosh-Hemphill Co., the A. Garrison Foundry Co. and the Pittsburgh Iron & Steel Foundries Co., first news of which was published in THE IRON AGE, March 16, 1922, page 743. Included in the combination, which takes the name of the Mackintosh-Hemphill Co., is the Woodard Machine Co., Wooster, Ohio, an interest of the Mackintosh-Hemphill Co. Negotiations were completed more than a month ago, and the official announcement was delayed pending a meeting of stockholders of the Mackintosh-Hemphill Co., approval of which was necessary to the consummation of the deal. The merger has been accomplished through the purchase of the stock of the A. Garrison Foundry Co. and the merging of the Pittsburgh Iron & Steel Foundries Co. and the Woodard Machine Co. in the Mackintosh-Hemphill Co. The capital of the last named company has been increased from $1,000,000 to $6,500,000, consisting of $2,850,000 7 per cent cumulative preferred stock, all of which has been issued, and $3,650,000 common stock, of which $3,000,000, or 30,000 shares of par value of $100, has been issued. This increase will provide for the exchange of shares in the Pittsburgh Iron & Steel Foundries Co. and Woodard Machine Co. into Mackintosh-Hemphill stock. An issue of $4,000,000 27-year 6 per cent sinking fund gold bonds has been authorized by the Mackintosh-Hemphill Co., and of this $3,000,000 has been put out to provide funds to complete payment for the properties of the consolidating companies, for the payment of existing mortgages and bank loans, and to furnish additional working capital for the new company.



JAMES HEMPHILL

Mr. Hemphill's designs in heavy rolling mill machinery have been responsible for many record outputs in more recent practice. Mr. McClurg was

JOSEPH McCLURG

one of the builders of the first Pittsburgh foundry 119 years ago, and Mr. Garrison's name has been connected with the same business since 1836.

ABRAM GARRISON

A committee on which George S. Macrum, George W. Baum and Joseph E. Fawell represented the Mackintosh-Hemphill Co. and the Woodard Machine Co., and J. Ramsey Speer and H. V. Blaxter, the Pittsburgh Iron & Steel Foundries Co. and the A. Garrison Foundry Co. conducted the negotiations. The officers of the new company are: Pennock Hart, chairman; George S. Macrum, president and treasurer; G. W. Baum, Joseph E. Fawell and L. A. Woodard, vice-presidents; D. H. Baum, secretary, and A. W. Bendig, assistant secretary and assistant treasurer.

This merger has an historical significance, in that it reunites foundry interests which trace their origin to the first foundry established in Pittsburgh. The principal stockholders in each of the companies are descendants of the original owners and their associates. J. H. Ricketson, Jr., and O. G. Ricketson, retiring officers of the A. Garrison Foundry Co., are grandsons of Abram Garrison, to whom the success and reputation of the Garrison company is largely due. Pennock Hart, chairman of the board of directors, Mackintosh-Hemphill Co., is the son of N. F. Hart, one of the founders of Mackintosh-Hemphill Co.; George Macrum, president, is a son-in-law of William Wade, whose name appears prominently in the early history of the Fort Pitt Foundry; G. W. Baum, vice-president, is a son-in-law of James Hemphill; and J. Ramsey Speer and J. McK. Speer are great-grandsons of Joseph McClurg, who founded the Pittsburgh Foundry, and of William McKnight, who with Mr. McClurg operated the plant for a number of years during its early history; Charles McKnight is a grandson of William McKnight. The McClurgs and McKnights also were active in the early history of the Fort Pitt Foundry.

It is doubtful if larger contributions have been made to the success of the iron and steel industry than those made by the members of this group. The earliest rolling mill and blast furnace engines, the rolls for the various requirements of the mills, the most effective pipe balls in the earlier days, all testify to the skill and knowledge of those who headed these companies.

First Foundry in Pittsburgh

The first foundry in Pittsburgh, and probably the first one west of the Allegheny Mountains, was built in 1803, on what is now the site of the Park Building, at Fifth Avenue and Smithfield Street, by Joseph Mc-

Clurg, Joseph Smith and John Gormley. It was called the Pittsburgh Foundry. Shortly after its establishment, or before 1807, Joseph McClurg bought out his two partners, and with his son, Alexander McClurg, conducted the business until 1814. The early years of the Pittsburgh Foundry are particularly interesting, since it was here that many of the cannonballs used by Commodore Perry at Lake Erie, and by General Jackson at New Orleans in the War of 1812, were made. After the end of this war, the foundry was devoted to the production of water pipe, stoves and miscellaneous agricultural castings. The record of the ownership of the Pittsburgh Foundry shows remarkably few changes, and almost a continuous line of descent through the families of the original owners and their associates.

From 1814 to 1822 it was owned and operated by McClurg & McKnight. From 1822 to 1830 by Alexander McClurg & Co. At this time it was merged with the Jackson and Eagle foundries, owned by Kingsland & Lightner. From 1831 to 1840, the firm was known as Kingsland, Lightner & Cuddy. In 1836 Abram Garrison obtained an interest in the business, and in 1840 Mr. Garrison, who was a nephew of Mr. Kingsland, and H. L. Bollman, a nephew of Mr. Lightner, succeeded their uncles, and associating with them H. F. Bollman, conducted the business under the name of Bollmans & Garrison until 1851, when H. F. Bollman withdrew. From 1851 to 1863, the firm was Bollman & Garrison, and from 1863 to 1865 Bollman, Garrison & Co. In 1864 Mr. Bollman retired, and in 1865 the partnership of A. Garrison & Co. was formed. The company was incorporated under its present name in 1887. In 1852 the original location at Fifth Avenue and Smithfield Street was given up, and the foundry was moved to its present location on the south side of the Monongahela river between Ninth and Tenth streets.

Because of the failure of Mr. Garrison's health in 1862, the active management of the business was turned over to his son-in-law, J. H. Ricketson, who held the presidency until his death in 1900. He was succeeded by his son, J. H. Ricketson, Jr., who has had active charge of the company up to the present time.

First Chilled Rolls

The first chilled rolls made west of the Allegheny Mountains were cast in 1825 at the Eagle Foundry of Kingsland, Lightner & Co. After the merger of this company with the Pittsburgh Foundry in 1830, the importance of the development of rolls and rolling mill machinery was appreciated. Almost the entire capacity of the foundry up to the present time has been devoted to the production of rolls and rolling mill equipment, not only for use in the rapidly expanding steel industry, but also for rolling brass, copper, zinc and other non-ferrous metals. In 1842, the first chilled rolls for rolling sheet brass made in this country were furnished by Bollmans & Garrison to the mills of the Naugatuck Valley in Connecticut. Rolls for this service had previously been imported from England. Mr. Garrison's success in making these rolls resulted in the adoption of American made rolls by most of the brass and copper sheet makers.

The prestige obtained by the manufacture of the first chilled rolls in the Pittsburgh district has been consistently maintained. The names of Pittsburgh Foundry and later A. Garrison Foundry Co. are nationally associated with the development and production of chilled iron rolls. The company also has become prominent in the designing and constructing of mills, roll tables and auxiliary equipment for the smaller structural and sheet mills. However, its efforts have not been confined exclusively to the development of the small mills. It has designed and installed a 152-in. plate mill which requires chilled iron rolls 42-in. in diameter, weighing 72,000 lb.

Established in 1837

In 1837 Calvin Adams established in Pittsburgh a small iron foundry for making pump plungers and small castings. It enjoyed continued success, though on a small scale, and later the firm became known as the S. Jarvis Adams Co. Under the management of S. Jarvis Adams, the son of the founder, the company built up a reputation as makers of cast iron pipe balls and bell dies used in the manufacture of welded pipe. In 1899 the business was purchased by J. Ramsey Speer, J. McK. Speer, Charles McKnight, H. C. Fownes and W. C. Fownes, Jr. In 1907 the requirements for increased plant capacity were met by the purchase of a site at Midland, Beaver County, Pa., and the erection of a foundry and machine shop of the most modern type. The name was changed from the S. Jarvis Adams Co. to the Pittsburgh Iron & Steel Foundries Co. in 1912 and the interests of H. C. Fownes and W. C. Fownes, Jr., were acquired by J. Ramsey Speer, J. McK. Speer and Charles McKnight.

Adamite, which was conceived by J. Ramsey Speer two or three years previously, was perfected and patented by him in 1913. It was soon demonstrated that Adamite possessed properties of great value when the metal was used for rolling mill rolls and pinions. The plant was equipped with open hearth furnaces and large annealing pits for the efficient production of rolls and other castings.

Since 1913 the attention of the company has been devoted almost exclusively to the production and development of Adamite, and since its first use for steel mill rolls a number of other alloy rolls have followed, all of which have had an influence upon the efficiency and economy of steel mill practice. Adamite has functioned with particular success in castings subject to abrasion, as well as in other special services requiring a close grained homogeneous structure.

The American Adamite Co., which holds the patents to Adamite, is not included in the merger, but will probably license the new company, as it does the United Engineering & Foundry Co.

Mackintosh-Hemphill Co. History

The Fort Pitt Foundry, now owned and operated by Mackintosh-Hemphill Co., was originally established on or near its present location at Twelfth and Etna Streets, Pittsburgh, by Alex McClurg some time before 1825. Mr. McClurg was succeeded in the ownership of the foundry by the firms of McClurg, Pratt & Wade; McClurg, Wade & Co.; John Freeman; Freeman, Knap & Totten; Knap & Totten; Knap & Co.; Knap, Rudd & Co.; Chas. Knap's Nephews; Knap-Fort Pitt Foundry Co., and in 1878 the property and business was purchased by Mackintosh-Hemphill Co.

The earlier years of the Fort Pitt Foundry were devoted to the manufacture of the miscellaneous iron castings in use at that time. Later the owners undertook the manufacture of engines, locomotives, boats and shot and cannon for the Government. The first locomotive west of the Allegheny Mountains was built here, and before 1850 a number of iron vessels for use in the revenue service on the Great Lakes were completed and launched in the Allegheny River.

In 1841 Knap & Totten, as the firm was then called, received a contract for cannon from the War Department and from that time until the close of the Civil War much was done in the production of munitions. Some of the largest cannon used were cast here, and the two most celebrated makes of the period, the Dahlgreen of the Navy and the Rodman of the Army were practically developed and perfected at the Fort Pitt Foundry. In 1859 James Hemphill, Dr. W. S. Mackintosh and N. F. Hart entered into a partnership and purchased a small machine shop at the corner of Twelfth and Pike Streets. To this enterprise Mr. Hart contributed the financial support, Mr. Hemphill the engineering and practical shop experience and Dr. Mackintosh some valuable patents, including one upon a new type of oscillating steam engine. The partnership was later incorporated under the name of Mackintosh-Hemphill Co., Ltd. In 1878, to meet the requirements of the growing business, the Fort Pitt Foundry, which adjoined the original Mackintosh-Hemphill shop, was purchased and entirely rebuilt. The old wooden lathes used by the Fort Pitt Foundry for turning and boring cannon were replaced by modern equipment for building engines and rolling mills.

In the light of present knowledge, it is obvious that Mr. Hemphill's theory that weight and solidity of construction were fundamental considerations in the de-

sign of heavy duty engines and rolling mill equipment placed him far in advance of his age. The first successful two-high blooming mill was designed and installed by him at the Pittsburgh Bessemer Steel Works, now the Homestead Works of Carnegie Steel Co. The tonnage records of today, which but a few years ago would have seemed utterly impossible, have been achieved largely by the projection and development of the designs worked out by Mr. Hemphill. Upon his death in 1900 his son, N. A. Hemphill, was elected to the presidency of the company. In 1902 he disposed of his interests and retired from active business, Joseph Fawell succeeding him as president. Mr. Fawell died in 1914 and was succeeded by Pennock Hart, who continued in active management of the company until December, 1919, when he resigned to become chairman of the board of directors. George S. Macrum was elected to the vacancy and in addition has held the office of treasurer.

The Woodard Machine Co., Wooster, Ohio, was incorporated in 1916, at which time it acquired the plant and property of the Canton Hughes Pump Co., Wooster, Ohio, and also the Foundries Co. at Orrville, Ohio. Later the equipment at Orrville was moved to Wooster. The company, under the direction of L. A. Woodard, its president, has extended and improved the plant at Wooster to include an iron foundry and an extensive machine shop with special patented equipment for cutting gears and racks with double helical teeth; also equipment for hobbing high speed helical gears up to 12 ft. in diameter. In addition to gear work the company has devoted considerable attention to the development and construction of seamless tube mills, welded pipe mills and mills for hot-rolled strip steel.

PICTURES OF STEEL MAKING

Films May Be Obtained from Department of Commerce—To Be Shown at Rio de Janeiro Fair

WASHINGTON, Aug. 1.—World-wide distribution is to be given to the processes of manufacture and welfare work in the American iron and steel industry through a six-reel motion picture film, to be known as "The Story of Steel." It is to be produced under the auspices of the United States Bureau of Mines of the Department of the Interior and the United States Department of Commerce in co-operation with the United States Steel Corporation. The picture is to be presented extensively in the United States and abroad and will acquaint the peoples of the world with the industry in all of its operations.

The story is to begin with the mining of ore and will end with the making of finished products, passing through the transportation period, blast furnace operations and the making of steel by the Bessemer, open hearth and electric processes. In a graphic way the picture will show the production of rails, plates, shapes, axles, rods, wire products, pipe, tin plate and the numerous other products so as to give the audience an intimate study of the processes of manufacture and coupled with it will be a presentation of the activities of welfare and social character conducted by the United States Steel Corporation.

The picture is to be used extensively at the coming world's fair in Rio de Janeiro this year and efforts also will be made by the Government to show it before the leading engineering and other organizations throughout the world. The film will be loaned without cost to all dependable parties. Application for its use should be made to the Department of Commerce, Washington.

Mining Institute at San Francisco

The 126th meeting of the American Institute of Mining and Metallurgical Engineers will be held at San Francisco Sept. 25-29. The institute is organizing a transcontinental trip for this meeting, the party leaving the Grand Central Station, New York, at 6 p. m. on Saturday, Sept. 9. The trip will be via Chicago, Denver, Salt Lake City, Butte, Spokane, Seattle, Portland, Sacramento and Reno, and San Francisco will be reached on Sunday morning, Sept. 24. Technical sessions will be held at the Engineers' Club in San Francisco on the following day. Most of the week will be devoted to an excursion to Hetch Hetchy, San Francisco Water Project. Those not taking this trip will visit interesting points in the vicinity of San Francisco. The return trip will be by the southern route, with stops at Los Angeles, Kingman, Grand Canyon, Globe, Bowie and El Paso. Chicago will be reached on Oct. 10 and the party will arrive at New York Oct. 11. Among the papers scheduled for the meeting are the following:

"Conditions of Stable Equilibrium in Iron-Carbon Alloys," by H. A. Schwartz, H. R. Payne, A. F. Gorton and M. M. Austin.

"Effect of Nickel Chromium on Cast Iron," by Richard Moldenke.

"Heating and Cooling Curves of Large Ingots," by F. E. Bash.

"Mining Iron Ore in the Adirondacks," by John E. Hodge.

Employment in Pennsylvania

HARRISBURG, PA., Aug. 1.—Despite the disturbing influence of strikes and coal shortages, the iron and steel trade of Pennsylvania continued to show improvement during the first half of July. The semi-monthly report of Clifford B. Connelley, Commissioner of the Department of Labor and Industry, indicates but 20,050 iron and steel workers were reported employed on July 15, this being slightly more than 60 per cent of those without work on June 15 and more than 78 per cent of those on July 1. The figures for June 15 were 33,250 and for July 1, 25,500.

Unemployment conditions throughout the State, exclusive of in the mine trade and railroad shops, continue to show improvement. Exclusive of those without work in these two trades as a result of strikes, the department reports only 101,705 persons without employment. This shows a reduction of more than 20,000 in the first two weeks of July, 124,665 having been reported without employment on July 1.

The strike of railroad shopmen has resulted in an increase in unemployed metal and machinery workers in some cases in Pennsylvania, while coal shortages, resulting from the strike of miners, have necessitated the closing of some plants. Despite these, seven of the ten employment districts of the State report fewer unemployed on July 15 than on July 1; one reports no change, while two districts report more without employment.

American Electrochemists at Montreal

Arrangements have been made for a trip of inspection through the industrial developments at Shawmigan Falls, the great electro-chemical center of Canada, at the time of the fall meeting of the American Electrochemical Society at Montreal, Sept. 21, 22 and 23. The program for the technical meeting will embrace from 16 to 20 papers. The projected symposium on electro-osmosis has been abandoned.

Engineers to Meet in San Francisco

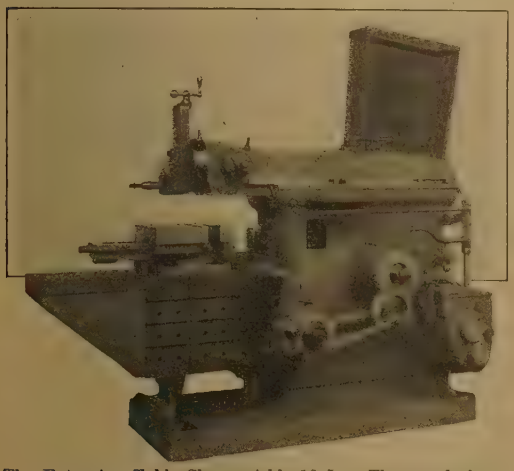
The fall meeting of the American Institute of Mining and Metallurgical Engineers will be held in San Francisco in the week of Sept. 25. F. W. Bradley, San Francisco, has been appointed chairman of the committee on arrangements.

For the Gary, Ind., plant of the National Tube Co., for grading and the foundation work, a contract has been given to the Mellon-Stuart-Nelson Co., contractor, Pittsburgh. The work is expected to take six to eight months.

New Gear-Drive Crank Shaper

A gear-drive, 24-in. crank shaper known as the 1922 design, and arranged for either motor or single pulley drive, has been placed on the market by the Hendey Machine Co., Torrington, Conn.

The new tool, shown in the accompanying illustration, is of the same general design as the company's cone-pulley type of machines. Among the advantages of the speed-change gear mechanism are that its application permits of greater and more constant power, and also that this design lends itself readily to application of motor drive. The motor is mounted on a bracket at the rear, and silent chain transmission used. Push



The Extension Table Shown Adds 18 In. The speed change gearing is in the oil-tight box at right

button control may be provided. The machine may also be driven directly from the line shaft, no countershaft being necessary.

The speed-change gearing is in an oil-tight box on the right side of the machine as shown, and it is to be noted that the projections of this box are within the floor space required for the machine. There are but eight gears in the assembly, all of which are of alloy steel, hardened and heat-treated. Four speed changes are provided, which with the regular back gears of the machine gives eight speeds.

Gear shifts are conveniently made with a ball-handle lever guided by slots in an H-plate and their manipulation is further simplified by the quick stop and start clutch provided, which is controlled by a long horizontal lever passing to the front of the machine, as shown. The operator manipulates this lever with his left hand while making gear shifts with his right. The driving clutch is of the double angle cone type and engages with the driving pulley, also acting as a quick brake when shifted in the opposite direction. It has a very short motion and gives a quick start and stop to the ram, a feature which saves time and is of great value in setting tools and taking measurements. Index plates conveniently placed show the number of strokes per minute and the approximate cutting speeds produced according to the position of the levers.

The ram can be set in any position while in motion or idle, the length of the stroke being shown on the index provided. The ram has a bearing in the frame of 12¼ by 41¼ in. and the ways for the ram in the frame have an angle of 50 deg. The gib for the ram is combined with the cap in one casting making it very rigid, and permitting complete take-up by a single adjustment in a horizontal direction. The actual stroke of the ram is 24¾ in. The head slide has a binder which may be used as a drag and the swivel head is equipped with a single binder screw.

The cross-feed mechanism is operated at the end of the cross-rail, in all its adjustments, a dial with indicator serving to control the amount of feed while the machine is in motion. The feed may be manipulated while in motion by the ball lever on top of the casting and the lever points in the direction of the table travel. The power down-feed is optional and when applied is set by the graduated dial for any feed from 0.005 to 0.060 in. in steps of 0.005 in.

Aside from the usual T-slots, the table has rows of jig-drilled and reamed plug holes at right angles to the faces of the table for blocking and fastening the work. The minimum distance from the ram to the table is 4 in. The vertical travel of the table is 14¾ in., the horizontal travel being 30 in. The top of the table is 17 by 24 in. and the side 17½ by 18 in. A table extension can be provided, giving a total length of 42 in., and a tool post extension can be provided with it. The table may be removed and worked bolted to the saddle, which is provided with finished T-slots. Vise jaws are 14½ by 3 in., and the vise opens 16 in.

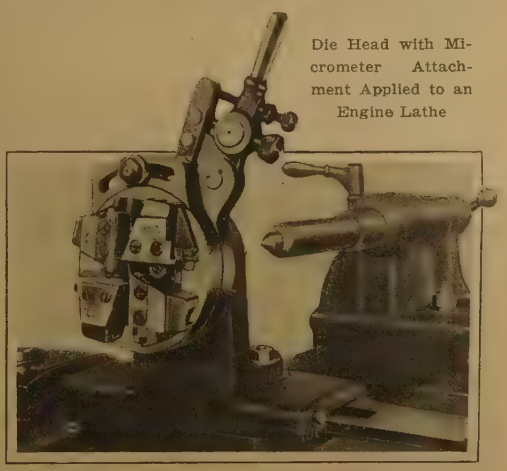
The floor space occupied by the machine is 52 by 107 in., and the weight, net, 5680 lb.

Die-Head with Micrometer Attachment

A stationary type die-head with micrometer attachment, the general arrangement of which is shown in the accompanying illustration, has been added to the line of the Landis Machine Co., Waynesboro, Pa. It is intended to be particularly useful in connection with cutting threads which require one or more roughing cuts and a finishing cut, the micrometer attachment permitting the setting of the die-head so that the same amount of metal is left on all pieces for the finishing cut.

The head is graduated for both right and left hand and for all sizes of bolts and pipe within its range, the graduations being stamped on the outer surface of the closing ring above the circular slot, as shown. The die-head is adjusted to size by loosening the clamping nut and bringing the index mark opposite the required graduation on the scale, further adjustment being made, if required, through the micrometer attachment.

The micrometer attachment is adjusted by backing off the upper, or stop screw, after first loosening the



Die Head with Micrometer Attachment Applied to an Engine Lathe

stop screw lock nut; the micrometer screw, below these, then being adjusted for increasing or decreasing the diametrical adjustment. Turning the micrometer screw in a counter-clockwise direction, causes the upper part of the link shown to swing to the left about the lower center, which pulls the closing ring to the right and increases the diametrical adjustment. Turning the micrometer screw in the opposite direction causes a counter movement of the link and decreases the diametrical adjustment. After the micrometer adjustment is made, the stop screw is set against the link and locked in place with the lock nut.

For the roughing cut the die-head is adjusted by turning the micrometer screw in a counter-clockwise direction until the desired diametrical adjustment is obtained, the stop screw being left in the locked position. Two or more roughing cuts can be made by decreasing the diametrical adjustment of the die-head

in one or more increments through the micrometer screw. When the roughing cut has been made, the micrometer screw is turned back in a clockwise direction until the link comes against the stop screw, the die-head then being set for the final diameter and is ready for the finishing cut.

The die-head described may be applied to turret lathes, engine lathes, and hand operated screw machines, being also applicable to all lathe types of threading machines where the work is revolved and the threading head remains stationary. In applying the head to a turret lathe it is equipped with a shank to conform to the dimensions of the socket of the turret, and used in connection with the cross slide of an engine lathe a special knee bracket is necessary, a special dead center being also required. The work can be gripped in a chuck and threaded without the use of the centers when the shape of the part makes it necessary.

PROTECTION BY ALUMINUM

Coated Grate Bars Shown to Have Four to Six Times Life of Bars Untreated

In the issue of the *Revue de Metallurgie* for May, 1922, there is a short article by Leon Guillet giving the results of experiments obtained with metal protected by an aluminum coating.

This coating was somewhat similar to that well known in this country under the title of calorized, but instead of being obtained by packing the articles in powdered aluminum and other agents and raising to a high temperature, the articles were coated by means of the Schoop process. This process consists in melting the metal used, whether aluminum or zinc or whatever it may be and projecting the melted metal in a fine spray against the article to be covered. The coating so obtained when aluminum is used has been given the name of "aluminage." The results obtained with metal so protected do not appear to be comparable with those of calorized metal, except in particular cases and especially when the temperature reached by the pieces is low.

Two applications have been noted during the last few months which are of sufficient interest to merit attention. They consist of fire grate bars and also of cast iron stoves. In both cases the life of the samples was considerably increased.

Fire Grate Tests

First in regard to fire grate bars; the tests have been chiefly made in Denmark and Germany, although tests are being carried out in France especially with locomotives of the Chemins de Fer de l'Etat. In 1919 a preliminary series of tests were made in Germany with grate bars, on which a coating of pulverized aluminum had been made. In this case freight engines of the Prussian State railroad were used. The results showed that the resistance of the grate bars so treated were six times greater than that of untreated bars. In 1920 another series of tests were made with four express locomotives, one-half of the grate bars in each fire (20 bars) were covered with aluminum and the others were untreated. Every four weeks the bars were weighed and photographed. At the end of the first four weeks the untreated bars lost on the average 250 gr.; after 8 weeks 1600 gr.; after 12 weeks 2050 gr. per bar. After a period of six weeks some untreated bars had to be replaced, and after sixteen weeks not any of the original twenty untreated bars remained. At the end of four months none of the treated bars were attacked and the loss in weight was insignificant.

Tests With Cooking Stoves

In Denmark the State railroad carried out a large number of similar tests in the autumn of 1920. On the other hand the Danish company Soyakagefabrik carried out a very interesting series of experiments on cooking stoves. After 2000 hr. the firepot was completely corroded and needed replacement. In the same case a similar plate covered with aluminum remained practically intact after 2000 hr. of service. Also some tests were made on tuyeres; those covered with aluminum retained very smooth faces and were hardly, if at all, attacked by the fire.

To sum up the tests made under the conditions given above, the treated samples gave at least four times the service and, as a general rule, six times the service of untreated pieces.

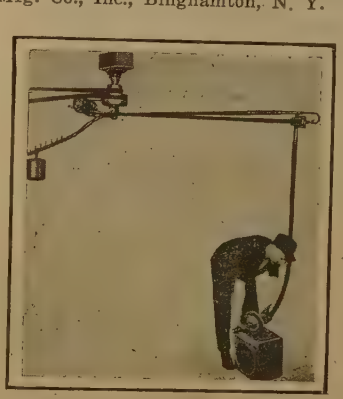
At the same time it would appear from experiments that are not yet finished that if the sample is carried to a high temperature the protection cannot compare with that obtained with calorization. The layer is detached easily and the protection fails. It should be added that, in regard to the fire grate bars, the information obtained is unanimous in regard to not only an important increase in the life of the bars but also that the clinker is much more easy to remove and does not stick so hard as with uncovered grate bars. This is extremely important and is not to be neglected.

The information given above comes from well authorized sources and it appears certain that the practical tests being made in France will confirm it.

G. B. W.

Flexible Radial Grinder

The flexible radial grinder shown in the accompanying illustration, is a recent development of the Stow Mfg. Co., Inc., Binghamton, N. Y. It is designed for



Flexible Radial Grinder for Operation of Abrasive Wheels and Wire Scratch Brushes on Large Castings

grinding with maximum power over a large area, for the operation of abrasive wheels and wire scratch brushes on large castings, automobile bodies and similar applications. It may also be provided for drilling or with a screwdriver for assembling.

The grinder hangs from the ceiling and no countershaft is necessary, as it can be belted directly to the line shaft or the motor. The weight of the flexible shaft is counterbalanced, as shown, so that the operator is free at all times and may have the tool within easy reach and control. Five sizes are available.

French Iron and Steel Exports Increase

Exports of pig iron and steel from France during the first four months of 1922 were 818,167 metric tons, valued at 391,120,000 francs, as compared with 674,939 metric tons, valued at 350,576,000 francs, during the same period of 1921.

Imports of pig iron and steel into France in the first four months of 1922 totaled 269,784 metric tons, valued at 214,328,000 francs, as compared with 189,926 metric tons, valued at 224,868,000 francs, for the same period of 1921.

The Peck, Stow & Wilcox Co., Southington, Conn., manufacturer of hardware and mechanics tools, at its annual meeting last week elected the following officers: L. E. Sichthorn, president; T. J. Ray, vice-president; George S. Case, secretary; and E. N. Walkeley, treasurer.

Economy Features of Electric Foundry*

Locating Furnace and Supply Bins—Handling Materials—What Is Involved in Caring for Electrodes—Laboratory Facilities Necessary

BY CHARLES WELLMAN FRANCIS

PROBABLY the most essential requisite of the installation of an electric furnace in the foundry is its location or relative position in the shop. Most foundry buildings of modern type construction are built with a main bay ranging in width from 40 to 65 ft. with a side bay or leanto on each side, of 20 to 30 ft. In the main bay are located overhead traveling cranes.

One of the best locations for the furnace is to place it just inside the main bay of the building, so that when the crane trolley is at its maximum position at the side, the crane hook will lift vertically the electrode farthest from the center of the building. This will govern its position relative to the width of the shop and leave it placed so that the maximum floor space is available between it and the opposite side of the main bay.

As to its position lengthwise, it is advisable to place it close to one end of the shop, for with the furnace in this position we have a continuous chain, so to speak, of raw material to finished product from the furnace end of the building to the other, respectively. This location is practical for the larger size furnaces. The only great disadvantage of this location is that valuable floor space under the overhead cranes is lost. However, this can hardly be rectified because electric furnaces of 3 tons capacity or more require at least 20 ft. of headroom to facilitate the raising of the electrodes, and this headroom can only be had, as a rule, under the cranes in the main bay.

Provided there is sufficient headroom, it is economy to place smaller size furnaces in one of the side bays of the shop, with the pouring spout pointing across the shop, and extending into the main bay to such a position that the crane trolley will give a vertical lift to the furnace ladle as it is raised from the pit. This location makes all of the floor space in the main bay available for molding and shaking out castings. An electric hoist can be erected alongside of the furnace in the side bay for raising the electrodes clear of the roof-eyes, as is often required when a roof has to be replaced, and subsequently for handling the roof.

Locating the Scrap Bins

The next question of vital importance is the handling of the materials, principally the scrap. Unless this problem be properly worked out, an enormous amount of money can be thrown away needlessly. It is advisable to have scrap bins built of brick and concrete construction close to the railroad siding, the top level of the side walls of the bins being the same height as the top of the standard gage gondola cars in which scrap is usually shipped. An electro-magnet can be erected at a convenient point to unload the steel scrap from the railroad cars to the bins.

An industrial railroad of narrow gage can be readily built along the face of bins, turning at right angles and passing into the shop through the side bay and thence to a point accessible to the furnace charging door. Just inside the door entering the side bay, a suspension platform scale can be readily located for weighing the scrap while it is being carried in small scrap cars of a dumping type. With this layout, the electro-magnet can be used for the double purpose of unloading the scrap into the bins and loading the small cars from the bins. By this means two men, one for operating the magnet crane and another for handling the industrial cars, can take care of all the scrap up to the point where it is piled near the furnace charging door, whereas by another arrangement it would require a regular yard gang of two or three times this number of men for unloading the scrap by hand to the bins.

Hand Charging of Furnace

In the author's opinion the most economical means of charging the furnace is by hand shoveling, provided the furnace is a 3-ton furnace or smaller, and the scrap is of a shoveling type. About three years ago the writer personally conducted a test to determine the time required for charging a 3-ton furnace by hand. This test covered a series of 30 heats, which were the first heats taken from this furnace. A green crew of three laborers was used and the charges consisted of about 40 per cent foundry scrap, the remaining 60 per cent being made up of heavy axle turnings and boiler plate punchings. The shortest time required to charge this furnace with 6000 lb. of scrap was 8 min., and the longest time was 14 min., the average time per heat being 12 min. As long as scrap can be handled at this rate there is no need for considering a charging machine which is cumbersome and in the way in a small shop, where space is exceedingly valuable. The crew of laborers which is used for charging the furnace can be used in the cleaning room or on the shakeout floor at intervals between heats, thus relieving the labor costs on the furnace department.

Aside from the scrap, the handling of the refractories and electrodes is the next problem of greatest importance. Silica roof bricks of special shape are easily broken and for this reason they should be stacked, together with the remaining types of brick, in a dry room or shed, which is not accessible for any other purpose, thoroughly protected from the weather, and in close proximity to the furnace.

Inspecting and Storing Electrodes

Electrodes should be stored under the same conditions as bricks, and they should be laid in tiers of parallel rows with several smooth boards laid parallel under the bottom row, to protect them from the dampness of the floor. The most important part of an electrode is the end, because it forms the joint between two sections of electrode. If the edges on the ends are chipped or broken, the efficiency of the electrode is greatly diminished, simply because the efficiency of an electrode depends on its current-carrying capacity per square inch of sectional area.

When a shipment of electrodes arrives at the plant, it should be subjected to a rigid inspection as each electrode is being unloaded from the car. Four main points should be considered during this inspection. First, that each electrode is free from linear cracks, which sometimes extend almost the entire length of the electrode. Second, that the threaded sections or the female ends of each electrode are concentric with the periphery or circumference of the electrode. Third, that the ends of the electrode are as nearly a perfect

*An article by Mr. Francis covering the choice of the electric furnace appeared in the issue of July 27, page 201.

circle as possible instead of being oval or elliptical. Fourth, that the end edges and threads are not chipped or broken in any way.

When the electrode ends are not concentric an overlapping at the joint is in evidence, giving a smaller sectional area of contact and subsequently less current-carrying capacity, which causes the electrode to overheat at the joint and pencil off. Chipped or broken ends and threads will cause the same troubles as mentioned above, while oval electrodes will often jam in the roof cooling glands and be the means of the automatic regulators functioning improperly. It is advisable to number or letter the corresponding ends of the electrode screws and electrodes, so that when they are put on the furnace in a certain order, the joints made are the best possible. A good electrode joint is probably the essential feature of real operating economy, as a large portion of furnace delays are caused by broken electrodes, portions of electrodes in the bath, etc., all of which are generally caused by a carelessly made joint.

Quick Test Laboratory Advocated

Probably no one can appreciate the value and saving derived from a quick-test laboratory more than the electric furnace melter. The initial expenditure on such an installation is little or nothing compared to the results obtained from it. Any number of foundries send drillings from a cup test to some outside laboratory for a determination of their final analysis. For preliminary carbon tests they rely solely on the melter's judgment of a fracture test piece. Often troubles arise during a heat when it is next to impossible to obtain a good fracture test, and it is in such emergencies that the chemical laboratory exemplifies its real value, for a laboratory test can be taken from any test sample that comes from the furnace. Another real value is that all incoming scrap can be quickly analyzed before the railroad cars are unloaded and the shipment rejected or accepted as the case may be. Our readers can judge for themselves whether the expenditure of a few hundred dollars is justifiable under such conditions as have been mentioned.

The author has endeavored in this writing to set forth a few points of value to be considered when a new electric furnace installation is contemplated. Foundry superintendents find that it is not the easiest matter to obtain improvements after a new installation is completed and in operation. If features which have been mentioned in this article are therefore included in the construction and installation costs, they will be greatly counterbalanced by the saving in melting costs, to say nothing of eliminating the confusion and other difficulties which accompany the installation of these features while the furnace is in operation.

OTIS STEEL CO. PLANS

Strip Department Will Be Included in Additions to Plant Capacity

The Otis Steel Co., Cleveland, in addition to the erection of a steel plant at its Riverside works to round out the present equipment, as announced in THE IRON AGE last week, will add a hot and cold-rolled strip department with an annual capacity of 80,000 tons. Extension plans provide for four 100-ton open-hearth furnaces, a 40-in. blooming mill and a 24-in. sheet bar mill to manufacture billets, sheet bars and slabs for its plate, sheet and strip mill departments. With the proposed extensions the company will have a complete steel making plant. It has been manufacturing pig iron since its purchase of the two blast furnaces of the Cleveland Furnace Co., in 1919, but at present has to buy its semi-finished steel from other producers. It is announced that on completion of the new units the company will have an annual capacity of approximately 534,000 tons of finished steel products.

To provide funds for the extensions and $1,000,000 additional working capital, The Otis Company is offering through investment houses, a $5,000,000 issue of first mortgage, 25 year, 7½ per cent sinking fund gold bonds and proposes to issue 330,000 additional shares of no par common stock which will be offered to present stockholders at $11 per share. A special meeting of the stockholders will be held Aug. 25 to take action on reducing the present authorized amount of capital stock to the amount outstanding, this being required by law before an additional stock issue can be voted. Another stockholders' meeting has been called for Sept. 18 to approve the proposed increase in common stock.

Labor Supply and Immigration

Only 68 1-3 per cent of the number of aliens permitted under the 3 per cent limitation law were admitted to the United States in the fiscal year ended June 30, according to figures of the Bureau of Immigration. The number admitted was 243,953, out of a possible 356,995. This compares with 805,228 admitted during the preceding year.

In the five-year period, 1910 to 1914, admissions aggregated 5,174,701, an annual average of 1,034,940, and the excess of arrivals over departures added 3,731,809 persons net to our population, at an average yearly rate of 746,362. In these five years more than 1,500,000 common and in excess of 500,000 skilled workers arrived in this country. From 1915 through 1919 the total net immigration was only 554,456, and the largest number of arrivals in one year was 326,700, in 1915.

According to the 1910 census, three-fifths of our bituminous coal, 65 per cent of our copper, more than half of our iron ore, three-quarters of our construction work, three-fifths of our slaughtering and meat packing, 85 per cent of our sugar refining, between 60 and 70 per cent of our woolen and cotton goods, nearly three-quarters of our clothing, more than half of our iron and steel, and 67 per cent of our leather were produced with the labor of foreign-born wage earners. Moreover, our railroad and highway building, as well as other construction requiring unskilled labor, has been done for the most part by this type of worker.

Ashtabula Steel Mill Soon to Operate

The plant of the Ashtabula Steel Co., Ashtabula, Ohio, a sheet interest, is being completed and initial production will be turned out early in August. The product will consist of sheet steel, black and galvanized, flat and corrugated. The plant has eight pair and sheet furnaces, now ready for firing, and equipment for pulverizing coal. Pickling and galvanizing machines have been installed. Sheet bars will be purchased on the market.

Machine Irons Out Buckles in Sheets

The MacKay Machine Co., Youngstown, Ohio, engaged in general machine and job work and in building special machinery, has evolved a roll leveler of its own design to roll the buckles and strains out of sheets. Installations have been made for the C. R. Wilson Body Co., the Packard Motor Car Co., the Ford Motor Co. and others. The machine has 17 rolls in bronze bearings, and operates at 80 ft. per minute in the buckling departments of several mills.

Sales of Leather Belting

Domestic sales of oak leather belting, as reported by the Leather Belting Exchange, and representing about 60 per cent of the total product, amounted to 103,890 lb. and $164,250 for the week ended July 15, compared with 81,987 lb. and $134,542 for the preceding week and 52,708 lb. and $89,447 for the corresponding week in 1921. Included in the current figures are 64,311 lb. of first quality, at $103,363, and 17,308 lb. of waterproof, at $32,717.

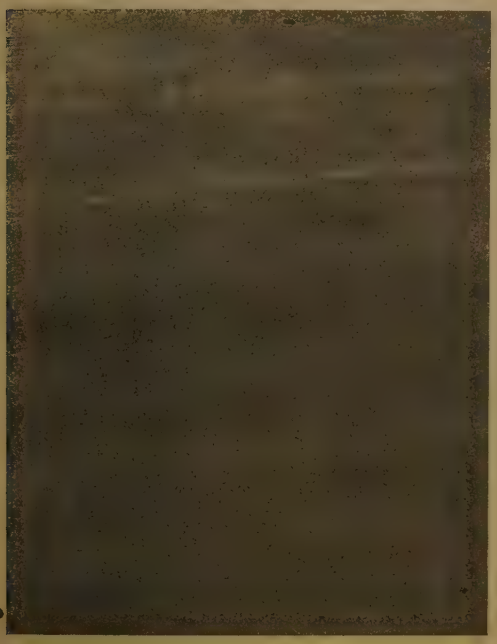
Use of Steam for Cooling Sheet Rolls

How Best to Apply—Better Cooling Method Needed to Reduce Roughening of Roll Surface—Deep Chilled Rolls Favored

BY GEORGE C. BROWN

SOME years ago the limit on sheet mills for double iron was 135 pairs for 8 hr. work. This limit was placed there by the Amalgamated Association of Iron and Steel Workers. The standard size roll at that time was 24 in. in diameter. This size was thought to be large enough to take care of the amount of heat that that number of pairs would add to the rolls, but at a convention held in 1903 or 1904 this limit was removed and the crews were allowed to turn out any number of pairs they could in the 8 hr.

It was then found that 24-in. rolls were not large enough to take care of the increased tonnage, so the diameter of the roll was raised to 26 in. After a time the men became so efficient in their work and by taking advantage of some minor details, such as one pass on the run over, etc., where two passes were given under the old method, they were enabled to turn out still greater tonnage and 26-in. rolls were found to be too small, making it necessary again to increase the diameter to 28 in. and 30 in., which latter size is in common use to-day.



The Illustration Shows a Sheet That Was Rolled on a Mill Where the Steam Was Applied Through Pipes Paralleling the Back of the Roll. The stripes show where the steam has pitted or roughened the roll. The effect is just as bad when the steam is applied through a hood under the foreplate, but with this method the entire surface is roughened instead of striped

Where this limit of the diameter of the sheet roll is I am unable to say, but it would seem that we have about reached it; but even with this larger size roll we have to resort to artificial means of cooling. For this purpose we use steam, which is a crude means, as there is no question that it roughens the surface of the rolls. Especially is this true where the chill is light, say, of ½ or ¾ in. in depth and soft or medium in hardness. This roughness from steam is not so apparent where the chill is of a good depth and reasonably hard. The effect on the roll is just the same, but the harder chill of course offers a greater resistance and will run a longer time or make a greater number of heats before becoming rough.

Again is this soft light chill bad in that it picks up iron from the pairs while roughing and makes a rough pitted sheet when finished. In heavy orders such as Nos. 26 and 25 gage double, it is almost impossible to make a first-class sheet on a medium chilled roll, where one has to use a good head of steam, as is generally the case. It keeps a roller riding a polishing block almost continually, at least every two or three heats, if he wants to have good results. This cuts down his tonnage, as it takes from 5 to 10 min. to polish a roll.

It is generally supposed that there are less breaks on soft than on hard chilled rolls, but the way we work to-day continuously for 8 hr., I do not think there is much more risk on the hard chill than on the soft, and I know with the harder chill better results are obtained, both in the iron opening and in smooth sheets.

Steam is applied to the rolls in two ways: one through a funnel shaped hood under the fore plate; the other by means of a ½-in. perforated pipe paralleling the bottom roll under the guides, and one parallel to the top roll just above the guides. These perforations are about 1 in. apart and the pipe is ½ in. from the rolls.

There are no set rules that can be laid down for using steam, that is, I mean, no roller can follow a set of rules that will enable him to do good work and be reasonably safe from roll breakage at all times, for the roller who sacrifices his work by putting on a full head of steam continuously in order to keep from breaking rolls will not last long as a sheet roller. He will not be a profitable workman to the firm for which he works. Experience with the use of steam for a number of years has taught the writer that the following methods will be found good in the majority of cases:

> When you begin to rough your heat down, turn on a head of steam sufficient to give you the desired circle in the end of your pair. Every roller will know just what that circle should be. Let that amount of steam remain on during the roughing of the heat. When you come to the run over, turn about one-half the steam off. After the heat is run over and just before you rough your three finishers or whatever number you need, turn your steam up to where it was during the roughing of the heat. After the finishers are roughed down turn your steam down again for the finish to the same amount that you had on the run over. If you follow this out during the turn you will find that your rolls have changed shape very little. Expansion and contraction in the minimum are the main factor in preventing roll breaking.

It is thought by some that a sheet roll absorbs as much if not more heat on the run over and finishing

than it does on roughing because the iron is in contact with the rolls much longer. But this, I believe, is an error. If a sheet roll would absorb as much heat on the run over and finishing as in the roughing, why does one rough down three finishers after the run over before finishing to expand the rolls to the same place they were during the roughing? Then, again, if one will follow the record of rolls that were broken on the finish, he will find that 7 out of 10 were broken on the first pack out and in the first pass, showing that the rolls have contracted or lost heat between the time of roughing and finishing.

If one would slack the screws an inch or two and put hot packs through the rolls all day he would not add 200 deg. of temperature to the rolls, for this reason it is evident the rolls take on heat through pressure rather than by contact. The reduction is much greater on the roughing than on the finishing. For example, take a ¾-in bar, give it five equal passes on the chill rolls, making about 20 per cent of a draft; then, again, take a ½-in bar, give it five equal passes about 20 per cent draft also. The ¾-in. bar will be reduced ⅛ in. on each pass, while the ½-in. bar will be reduced only 1/16 in. Yet the draft is the same on both bars. The ¾-in. bar will add much more heat to the roll than the ½-in. bar, though the ½-in. bar may have been hotter on the roughing than the ¾-in. bar.

If from a pack that has broken a roll a piece is cut out just where the break has occurred, it will be found that it is almost impossible to detect with the naked eye the difference in thickness between what has gone through the roll and that which has not, yet the micrometers will show a draft from 30 to 35 per cent. From these facts it can readily be seen that it is reduction rather than contact that adds heat to the rolls.

The method given for applying steam is only for double iron. For single iron and for some of the heavier gages the fixing of the steam supply can be made at the starting of the turn to give the desired shape in the end of the pair and let it remain on during the 8 hr. Of course, no roller who expects to do good work will use as much steam on the lighter gages, such as on No. 24 single and No. 30 double sheets, as he would on heavier.

I said in the beginning of this article that steam was a crude method of cooling sheet rolls. The best that can be said for it perhaps is, that it is the less of two evils and that there will be a better method invented some day. I think myself that the better way would be through an application of warm air to be used as we use steam to-day. This would not pit the sheet rolls due to lack of moisture and I think it would reduce the heat just as effectively in the roll without the evil effects.

AN ENGINEERING MUSEUM

Movement to Establish One at the Smithsonian Institution at Washington

After the DeLamater-Ericsson commemoration on March 9, the sixtieth anniversary of the battle between the Monitor and Merrimac, the American Society of Mechanical Engineers appointed a committee to cooperate with the committee in charge in making a collection of historical material connected with Cornelius H. DeLamater and Capt. John Ericsson (during their 50 years' association [1840-1890] as the leading factors in the DeLamater Iron Works, at the foot of West Thirteenth Street, New York) H. F. J. Porter, chairman of the joint committee points out that these works were the largest institution of their kind in their day and there during the period mentioned developments took place in naval, merchant-marine, ordnance and industrial engineering "which helped materially to raise this nation from comparative unimportance to its recognition as the leading nation of the world, and yet of the details of this accomplishment there is no record. In fact, there is nowhere a tangible record of any of the steps whereby this country has attained its present commanding position in the world."

In seeking for a permanent depository for the DeLamater-Ericsson historical collection the committee conferred with the Smithsonian Institution at Washington and its secretary sent with his reply his latest report on the National Museum which is under his custody. The concluding paragraph of this report reads as follows:

> Museums devoted to history, art and the natural sciences are established in all of the larger nations of the world and many of them have established, in addition, educational museums of engineering and industries. Thus England has her South Kensington Museum; France her Conservatoire des Arts et Matiors (at Paris) and Germany her Deutsches Museum (at Munich), but nowhere in this nation of ours, the most advanced in the application of the engineering and mechanical arts, is there a similar institution. The commanding place in the world which the United States has reached in the short space of seventy-five years is due largely to the full development and utilization of mechanical power in the exploitation of her natural resources. It is this that has made it possible for the people of the United States to enjoy a standard of living far and above that under which the peoples of the rest of the world exist, and still no public sign of appreciation, either national or otherwise, is to be found anywhere. What more suitable monument could there be, therefore, than a Museum of Engineering and where could there be found a more logical place for it than as a part of the great National Museum?

The Smithsonian Institution then not only solicited the placing of the DeLamater-Ericsson historical collection in its National Museum but proposed the cooperation of the committee in establishing the nucleus there of a great national engineering museum comparable to the foreign museums to record the accomplishments, in the upbuilding of this nation, of its engineers, who are only now beginning to secure a recognition of obligations too long deferred.

Notwithstanding all that the engineers have done for this country, it was not until 1920, Mr. Porter adds, that one of them, James B. Eads, was deemed worthy of being associated with the notables in other vocations in the Hall of Fame. "The first monument to an engineer is only now being erected and will be dedicated to Capt. John Ericsson in 1924 adjoining the Lincoln Memorial in Washington. The first engineer to be given a chair in a President's cabinet is Mr. Hoover, in the present administration."

The committee has responded that it realizes the responsibilities to be incurred in assuming the performance of such a task as has been proposed, but feeling that now is the time to do it, for every day passing is one during which the records needed are being lost and men who were leaders in events are dying off, and feeling that with the backing of the American Society of Mechanical Engineers, it is strong enough to do it, it has started the movement.

At the annual meeting of the American Society of Mechanical Engineers, there will be exhibited a part of the historical collection in the Engineering Societies' Building. Such of it as would be appropriate as representing the work of Capt. Ericsson will be sent as requested to the tercentenary of the city of Gothenburg, Sweden, to be held there next summer. On its return it will go with the rest of the collection to the National Museum at Washington.

It is desired to make this a national movement in which every engineer in the country will participate. Engineering societies and alumni associations of engineering schools are requested to communicate for further information with the joint committee on the National Engineering Museum, Engineering Societies' Building, 29 West Thirty-ninth Street, New York.

A meeting will be held within the near future for the election of officers of a recently formed western Massachusetts branch of the American Society of Mechanical Engineers.

Rates on Eastern Iron Ore Reduced

Schedule Which Prevailed Prior to August, 1920, Restored —Ex-Lake Ore Rates Unchanged by Interstate Commerce Commission

BY L. W. MOFFETT

WASHINGTON, Aug. 1.—Eastern iron and steel and iron ore interests, by a decision of the Interstate Commerce Commission handed down last Thursday, won their fight for a 28 per cent reduction on ore rates from Eastern mines, while iron and steel interests using Lake Superior ore lost in their efforts to get a 20 per cent reduction in rates. The decision, in addition to ordering suspended tariffs carrying the 28 per cent reduction in Eastern ore rates to go into effect on Aug. 28, also ordered that tariffs proposing a similar reduction in rates on imported ore become operative on that date. Suspended tariffs proposing the 20 per cent reduction on ex-lake ore rate were ordered canceled on or before Aug. 29.

The effect of the reduction is to restore the Eastern domestic and import ore rates to the level prevailing prior to the 40 per cent increase that went into effect on Aug. 26, 1920, and to place the rates on these two classes of ore on the same relationship that obtained before that increase was made. The 28 per cent reduction is to replace, and is not in addition to the 10 per cent decrease that became effective on July 1, 1922, by the general rate reduction decision of the commission. The ore decision has no effect on reduced import ore rates that are already in effect, such as the rate of $1 per ton from Constable Hook, N. J., to Bethlehem, Pa. It does, however, eliminate the 40 per cent increase of Aug. 26, 1920, where this had not been done. An instance of this is the $1.26 rate from Perth Amboy, N. J., to Bethlehem, which will become $1 on Aug. 28.

Effect of I. C. C. Ore Rate Decision

EASTERN or station-to-station iron ore rates reduced 28 per cent and restored to level existing prior to Aug. 26, 1920, eliminating 40 per cent increase. New rates go into effect Aug. 28.

Ex-lake ore rates remain unchanged from those going into effect July 1, 1922, when 10 per cent reduction was made in accordance with general reduction rate decision.

Pending tariffs reducing rates on imported ore to level existing prior to Aug. 26, 1920, also go into effect Aug. 28. This will bring these particular rates on imported ore from Eastern tidewater to a parity of rates on imported ore already in effect, and import and Eastern ore rates will be on the same basis as they were before the 40 per cent increase was made operative.

The Eastern and imported ore tonnages affected by the decision giving it the lowered rates, based on 1920 consumption, were about 2,096,321 and about 1,228,496 tons, respectively, while the ex-lake ore tonnage, on the same basis, which was denied the proposed reduction, was 35,700,000 tons, according to the estimate of the commission.

Lake Interests Disappointed

The decision, while a source of gratification to Eastern consumers and mining interests, and a distinct disappointment to the large consuming interests of ex-lake ore in Ohio, western Pennsylvania, West Virginia and Virginia, was fully concurred in by six members of the commission, while the remaining three, Commissioners Meyer, Aitchison, and Potter, concurred in the decision as to reducing the Eastern and imported ore rates, but sharply dissented as to the refusal to reduce the ex-lake rates. They maintained that these rates should also have been reduced 20 per cent as proposed in the tariffs which have been ordered canceled. They do not agree with the majority report that the new adjustment is necessary to a proper relationship between Eastern and ex-lake ore rates and rates on coal from and to certain points, or that the proposed ex-lake reductions would be an undue burden on the revenues of the carriers or on other traffic. The carriers, it will be recalled, also participated in the efforts to reduce the rates on all the ore traffic involved.

The commission did not find any relationship between upper lake ore rates to Lake Superior docks to the other rates under discussion. The upper lake rates, however, are the source of a pending case in which ore interests are seeking reductions, which the railroads serving the mines are opposing. The decision also did not involve the proposal of Buffalo district iron and steel interests, which opposed ore rate reductions while coal rates to their plants were unchanged, to establish minimum rate on ex-lake ore rates. The Buffalo interests, however, were not opposed to reductions in Eastern ore rates themselves, but were contending for lower coal rates, which were granted in part recently.

The decision covered three complaints. One was the general case of iron and steel and railroad interests, except the Buffalo iron and steel makers, seeking the 28 per cent reduction in Eastern rates, and the 20 per cent reduction in rates from Lake Erie ports. The other two were what are known as the Wharton Steel Co. and Ringwood Co. cases. The Wharton Steel Co., operating the Replogle mines, near Wharton, N. J., and the Ringwood Co. in separate cases, later consolidated with the general case, had also been seeking the reductions, which were granted, on rates to furnaces in eastern Pennsylvania and New Jersey, which, it was charged, were unreasonable, unjustly discriminatory, and unduly prejudicial in comparison with the rates accorded to competing mines in Pennsylvania, New Jersey, Minnesota and Michigan, and at Sterlington, Fort Montgomery and Mineville, N. Y.

History of the Proceedings

It will be recalled that in October, 1921, reductions of about 28 per cent were made in both the Eastern trunk-line and ex-lake ore rates, limited to expire Dec. 31, 1921. Prior to the latter date, the carriers applied to the commission for authority to extend on short notice the period for an additional three months. At that time, the commission was considering the question of general reductions in rates, and the authorization sought was denied. Early in March, 1922, the Eastern carriers filed the schedules, which were suspended, proposing a 28 per cent reduction in Eastern trunk-line ore rates. These were shortly followed by the suspended rates applying on ex-lake ore, now ordered canceled, which were modified so as to represent a reduction of only 20 per cent. Meanwhile there had gone into effect some of the reduced import ore rates, and carrying no date of limitation, they were not suspended.

The following table shows present rates and those

which go in effect on Aug. 28 on ore in cents per gross tons from Wharton, N. J.:

To	Present	Effective Aug. 28
Catasauqua	154	111
Coatesville	196	141
Lebanon	210	151
Steelton	224	161.5

The following presents similar facts as to rates from Ringwood:

To	Present	Effective Aug. 28
Hokendauqua	164	131
Emaus	201.5	161.5
Hellertown	201.5	161.5
Reading	201.5	161.5

The foregoing compares with the rate of $1.15 per gross ton on ore from Lake Erie ports to Pittsburgh, which it was sought to reduce to $1.02.

In taking up a discussion of the ex-lake ore rate case, the commission points out that on June 25, 1918, the ore rates from the mines to the upper lake ports were increased 36.5 cents, but no change was made at that time on the ex-lake ore rates. Under the general increases of 1920, the ex-lake, local, and import rates on ore were increased 40 per cent, but no further increase was made in the rates to the upper lake ports from the mines. The commission says there appears never to have been any fixed relationship between the upper and lower lake rates, and it is stated that the rates on coal and coke have become relatively higher than the rates on iron ore.

"While we are not prepared to find that there should be any definite or fixed relationship between rates on coal or coke on the one hand and the rates on iron ore on the other," the decision says, "it is evident that some consideration must be given to the maintenance of a relatively fair level of rates on the two commodities.

Former Plan of Rate Making

"To preclude misapprehension, it should be stated that we do not here sanction by implication any reversion to the type of rate making known as the equalization of freight-assembly costs of raw material," the opinion says. The commission emphasizes in its finding that on each raw material the freight charge must be properly apportioned to the service performed. It says: "The proposal of the carriers to single out only one of the raw materials for the manufacture of pig iron and to leave unchanged the general level of rates on all other raw materials used for the same purpose does not contemplate the same unlawful charges involved in the assembly-cost method; but in other respects it is equally indefensible. To affirm, however, that the level of rates upon one important raw material may be violently reduced below the comparative level of the rates upon all other raw materials finds not the slightest sanction in our rejection of the assembly-cost idea.

In justifying its denial of reducing the ex-lake rates, the commission says that, roughly, the ex-lake rates since July 1, 1922, represent an index number of 155, considering the rates fixed by the iron ore decision of 1916 as representing 100. Rates on traffic in general, it is pointed out, were increased to a level representing an index of over 200, taking the rates of 1916 as 100, and since July 1, 1922, they still represent an index of over 180.

"If the reduced ex-lake ore rates become effective, they will represent an index of approximately 138," it is contended. "In the absence of some showing that the ex-lake rates on ore are relatively high compared with other rates on ore and with rates on traffic in general, further reduction therein at this time would appear to be out of harmony with our findings in Reduced Rates, 1922." Since 1916 and up to July 1, 1922, the decision says, there has been an aggregate increase of about 55 per cent in the ex-lake rates and of over 85 per cent in such of the Eastern and import rates as have not been subject to more than 10 per cent reduction since the increase of 1920."

Speaking generally, the decision says, rates on Eastern trunk line and import ore, where such rates have not been reduced more than 10 per cent since the increase of 1920, are now much in excess of ex-lake ore rates for like distances, in many cases nearly double, and probably on the average more than 80 per cent higher.

The commission justifies the Eastern and import reduced rates and finds the proposed ex-lake rate reduction unreasonable and unlawful "for the reason that in relation to rates in general, and in relation to rates closely affiliated, such as on coal, they would tend to cast an undue burden upon other traffic; that they would be unduly prejudicial to ore traffic from mines in Eastern trunk-line territory, so far as the same carriers participate in the interstate carriage of both ex-lake and local mine ore traffic; that they are unlawful inasmuch as their establishment would jeopardize the rates on a large volume of other heavy-loading low-grade traffic which we have initiated under authority of section 15a of the interstate commerce act." Apprehension also was expressed lest it would adversely affect the annual return of 5.75 per cent fixed in the 10 per cent reduction case. The commission said it was persuaded the proposed reductions in ex-lake rates would not result in increased net revenues to the carriers, but in substantial reduction, "probably more than $3,000,000 per annum."

Dissenting Views

In dissenting in part, and with Commissioner Aitchison concurring in his views, Commissioner Meyer gave figures as to earnings and made comparison with upper lake and other ore rates to justify the reduction proposed in ex-lake rates. He said the conclusion of the majority as to the probable reduced earnings not being based on car-loading statistics, does not specifically show the movement under the ex-lake rates.

"It cannot, therefore, on this record be concluded that an increase in tonnage following the reduction in rates would not result in increased rather than reduced revenues for the carriers," he says. "The opinion of practically all parties on record was to the effect that a reduction in rates would result in increased movement and increased revenues." At another point, he states that: "The incidences of rate reductions are necessarily more or less uncertain, but on no commodity does a reduction in rate give greater promise of a resulting reduction in the price of intermediate and final products than in the reduction of rates on iron ore; and to this extent the report of the majority is standing in the way of a reduction in the cost of living."

Commissioner Potter in his partial dissent gives figures to offset the contention of the majority that the proposed reduced ex-lake rates would be an undue burden on traffic and as to the finding that the proposed rates would imperil the returns to which the carriers are entitled, says the carriers do not think they would. The apprehension regarding further jeopardizing of the 5.75 per cent return is replied to with the statement that it does not justify the interference of the majority view, and that condemnation of reductions in rates should have a better foundation in certainty as to what the results would be. A reduction of the ex-lake rate 20 per cent, it is stated, would be approximately 25 cents per ton and aggregate approximately $9,000,000 per year, based on the 1920 movement. Such reduction, Commissioner Potter points out, would reduce the cost of pig iron approximately 50 cents per ton and correspondingly reduce the cost of iron and steel products.

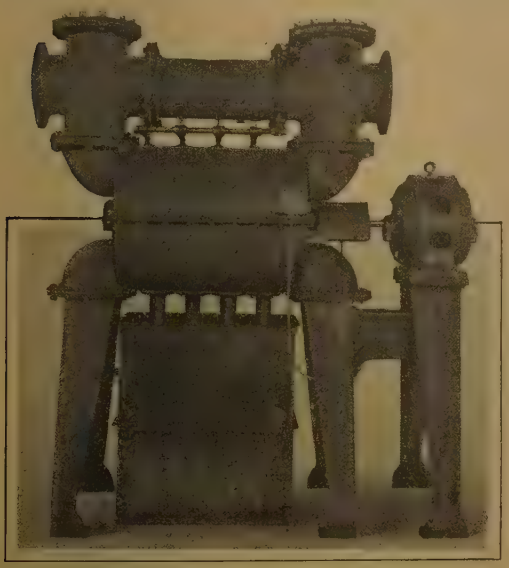
"The total 1920 movement of ore from mines in Eastern trunk-line territory was approximately 2,096,000 tons," he adds. "The protection afforded these ores by denying the proposed ex-lake reduction is 25 cents per ton, or an aggregate of $524,000 on the total movement. The protection of the Eastern mines to the extent of $524,000 is by the majority report made to cost the consumers of products of iron ore $9,000,000. To put it another way, in order to protect the Eastern ores to the extent of 25 cents per ton, the consumers of ore products are to be compelled to pay in excess of what they should more than $4 per ton on the ore produced by the local mines. I can see no justice in such action. We are not called upon to subsidize the East-

ern mines out of the funds of consumers generally of the products of iron ore. If the local mines are entitled to protection to the extent of 25 cents per ton, some means should be found which would not cost the consumers $4 per ton. It is to be noted, too, that the higher cost of pig iron continued by refusing the proposed reduction will naturally affect the cost to the consumer of products of import ore, so that the aggregate amount which the consuming public would pay on the basis of the majority report to protect the Eastern mines to the extent of $524,000 will be much in excess of $9,000,000. The interstate commerce act requires no such relation of ward and guardian between the local mines and this commission, as the majority report recognizes, at the expense of the producers of other iron ores and the consumers of their products."

Tar Extractor with Improved Features

A centrifugal tar extractor for cleaning producer gas, which has, among other features, a water spray directed upon the walls instead of upon the fan blades, is being manufactured and marketed by the Gas Producer & Engineering Corporation, 115 Broad Street, New York, under the name of the Galusha tar extractor and gas pump. It is a multi-stage design.

The size shown in the accompanying illustration is driven by a 16-hp. motor at 1720 r.p.m. Under test it removed, it is stated, over 99.5 per cent of the tar with the gas flow at a rate of 50,000 cu. ft. per hour. The gas enters the extractor after passing through a cooler, which is a small cylindrical tank fitted with



Tar Extractor and Gas Pump. The water spray is directed upon the walls instead of upon the fan blades

water sprays, to chill the gas to approximately 100 to 140 deg. Fahr. The clean gas is delivered from the extractor under pressure, which may be distributed in an ordinary steel pipe in the same manner as natural gas and city gas and used in the same way.

The machine has a housing divided by transverse partitions into four or more sections, each provided with a rotor and a spraying nozzle. The nozzles direct the flow of water upon the walls of the casing instead of upon the fan blades, thus reducing the power consumption. A suitable drain carries off the wash water and tar at the bottom. Centrifugal force keeps the water distributed over the stationary interior walls. The clearance between the rotor and the housing brings the gas and the film of water over the casing in close contact. The drains lead into a tar collecting tank at bottom.

The gas enters opposite the center of the first fan and is forced outward toward the periphery against the water covered casing. It then passes around the first rotor through a central opening into next stage and the process is repeated for each stage.

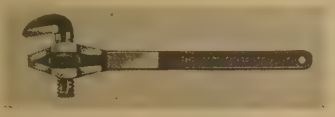
Some of the distinctive features claimed for the Galusha extractor are: Small amount of power required; elimination of gas blowers, because the extractor also puts the gas under pressure; separation of the tar from the water in a very small space at the extractor, and small space required for the unit as a whole and the simplicity of the whole apparatus.

Improved Pipe Wrench

A new pipe wrench known as the Little Giant and having the end-opening feature, as shown in the illustration, has been placed on the market by the Greenfield Tap & Die Corporation, Greenfield, Mass.

Simplicity, lightness and unusual strength are features claimed and the tool is designed to facilitate handling of pipe in corners and other confined places, the wrench being set on the pipe in the same manner as

Pipe Wrench with End Opening Feature



a pair of pliers, instead of having to fit the jaws on from the side.

The wrench is made up of only three parts, a drop-forged handle and jaw in one piece, heat treated; a drop-forged movable jaw, also heat treated, and a hardened steel nut. In this design springs, rivets, frame and pins have been eliminated. In a test of strength the 14 in. size is said to have withstood more than 4700 in. lb. without slipping or bending, the Army and Navy departments requiring but 2800 in. lb. for a wrench of this size. It is said to weigh less than a Stillson wrench of corresponding capacity.

A feature is the double set of teeth on the main jaw. The movable jaw can be engaged with either set of teeth which, it is pointed out, increases the life of that part. On the larger sizes four sets of teeth are provided, the movable jaw being reversible to engage the additional sets of teeth, which are below the adjusting nut.

The wrench will be made in 8, 10, 14, 18 and 24 in. sizes, the three smaller sizes being now available.

Cars and Locomotives at Low Prices

Low-priced steel has been no small factor in bringing large steel car orders to the books of the car works in the past six months. The *Railway Age* says of the exceptional prices named on cars and locomotives:

"The car and locomotive market has been greatly assisted by lower prices. Steel underframe box cars have been secured in recent months at prices approximating $1,500 or $1,600, steel hopper and gondola cars at from $1,600 to $1,800, the price varying, of course, with the size and design. Refrigerator cars cost at present about $2,700. Typical locomotive prices are $40,000 for a Pacific and from $37,000 to $42,000 for a Mikado. Six-wheel switchers have been bought at about $30,000 to $33,000. Passenger coaches have been secured at about $20,000. These prices represent marked decreases from the high prices which ruled in 1920 and are apparently proving a real attraction in so far as concerns bringing out orders. Considering the situation as a whole, other than the fact that we should normally expect a decline in business in the summer months, there is nothing at present in sight to lead one to believe that the equipment business will do else than continue in good volume."

RAILROAD STEEL CASTINGS

Testing Society's Tentative Specifications Just Adopted for Carbon Steel

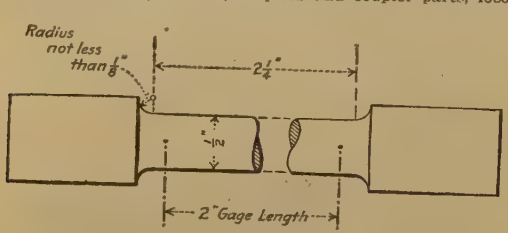
Among the new tentative specifications adopted by the American Society for Testing Materials, at its annual convention at Atlantic City, N. J., June 26th to 29th, those for railroad steel castings were prominent. They are the result of an extensive investigation and are reproduced as follows:

1. (*a*) These specifications cover all carbon-steel castings for locomotive and car equipment, and for miscellaneous use, classified as Grade A and Grade B.

(*b*) The purposes for which the two grades are generally used are:

Grade A, unannealed, covers only such special castings as may be approved by the purchaser. *Grade A*, annealed, covers such castings not covered by Grade A, unannealed.

Grade B covers all castings for high stresses such as truck side frames, bolsters, couplers and coupler parts, locomotive frames and locomotive driving and trailer wheel centers.



Note—The Gage Length, Parallel Portions and Fillets shall be as Shown, but the Ends may be of any Form which will Fit the Holders of the Testing Machine.

2. Grade A castings shall be furnished annealed unless otherwise specified by the purchaser.

Grade B castings shall be furnished annealed.

Manufacture

3. The steel may be made by one or more of the following processes: open-hearth, electric furnace, crucible or side blow converter.

4. (*a*) The castings shall be allowed to become cool. They shall then be uniformly heated to the proper temperature to refine the grain, and allowed to cool uniformly.

(*b*) For the purpose of determining the quality of annealing of all castings weighing 150 lb. or over, and of such lighter castings as shall be required by the purchaser or his representative, there shall be provided for removal by the inspector after annealing and also after reannealing, if necessary, at least one and not more than two annealing lugs. The location of the annealing lugs shall be such that when removed by the inspector they shall be indicative of the character of annealing. The standard annealing lug shall be 1 in. in height and 1 in. in width and ⅝ in. in thickness where it joins the casting.

(*c*) If, in the opinion of the inspector, a casting is not properly annealed, he may at his option require the casting to be re-annealed.

Chemical Properties and Tests

5. The steel shall conform to the following requirements as to chemical composition:

	Grade A	Grade B
Manganese, per cent, not over	0.85	0.85
Phosphorus, per cent, not over	0.05	0.05
Sulphur, per cent, not over	0.05	0.05

6. An analysis of each melt of steel shall be made by the manufacturer to determine the percentages of carbon, manganese, phosphorus, sulphur and silicon. This analysis shall be made from drillings taken at least ¼ in. beneath the surface of a test ingot obtained during the pouring of the melt. The chemical composition thus determined shall be reported to the purchaser or his representative, when requested, and shall conform to the requirements specified in Section 5.

7. An analysis may be made by the purchaser from the broken tension test specimen or from a casting representing each melt. The chemical composition thus determined shall conform to the requirements specified in Section 5. Drillings for analysis shall be taken not less than ¼ in. beneath the surface, and shall be taken in such a manner as not to impair the usefulness of a casting.

Physical Properties and Tests

8. (*a*) The steel shall conform to the following minimum requirements as to tensile properties:

	Grade A Unannealed	Grade A Annealed	Grade B Annealed
Yield point, lb. per sq. in.	29,250	29,250	36,000
Elongation in 2 in., per cent.	1,450,000	1,600,000	1,600,000
	Tens. str.	Tens. str.	Tens. str.
Elongation, per cent, not under	22	24	22
Reduction of area, per cent.	2,250,000	2,600,000	2,500,000
	Tens. str.	Tens. str.	Tens. str.
Reduction of area, per cent, not under	30	35	30

(*b*) The tensile strength shall be reported as information.

(*c*) The yield point shall be determined by the drop of the beam or by the dividers, the method being optional with the inspector, and at a cross-head speed not to exceed ⅛ in. per minute. The tensile strength shall be determined at a speed not to exceed 1½ in. per minute.

9. (*a*) A sufficient number of test coupons, from which the required test specimen may be prepared, shall be cast attached in the neighborhood of each end of each locomotive frame, attached to each locomotive cylinder, to each wheel center, and to miscellaneous castings weighing over 150 lb. These test coupons shall remain attached to the castings throughout the annealing and until the castings are presented for inspection. If the design of the casting is such that the test coupons cannot be attached, they shall be cast in runners outside of the casting, but attached to it, to represent each melt. The location of the test coupons, as well as the method of casting such coupons, shall be subject to mutual agreement between the inspector and the manufacturer. In the case of any orders for castings weighing under 150 lb., the physical properties as required in Section 8 may be determined from an extra or spare test bar cast with and attached to some other casting from the same melt.

(*b*) When sufficient coupons have not been cast, a test specimen may be cut from a finished casting at a location mutually agreed upon by the inspector and the manufacturer.

(*c*) Tension test specimens shall conform to dimensions shown in Fig. 1. The ends shall be not less than ⅞ in. in diameter and of a length and form to fit the holders of the testing machine in such a way that the load shall be axial.

10. (*a*) One tension test shall be made from the neighborhood of each end of each locomotive frame and both tests shall meet the requirements of the specifications. One tension test may be made from each wheel center and each locomotive cylinder casting, but of such castings at least one of each kind in each melt shall be tested. For miscellaneous castings from melts which do not include frames, wheel centers or cylinders, one tension test shall be made from each melt, except as provided in Section 11 (*a*).

(*b*) If the test specimen shows defective machining or develops flaws, it may be discarded and another specimen substituted.

(*c*) If the percentage of elongation of any tension test specimen is less than that specified in Section 8 and any part of the fracture is more than ¾ in. from the center of the gage length, as indicated by scribe scratches marked on the specimen before testing, a retest shall be allowed.

(*d*) No part of these specifications shall operate to cause any one tension test to apply to more than 40 tons of casting as offered for inspection.

11. (*a*) After 15 consecutive melts, which may contain any or all classes of castings (except frames, wheel centers and cylinders) covered by these specifications on one or more orders have been tested and accepted in accordance with the above requirements, the manufacturer may group the succeeding melts in lots of five melts each, but each lot not to exceed 40 tons, the entire group to be accepted if the test specimen selected from the lot fulfills the chemical and physical requirements herein specified. If this test fails, a rehearing will be granted on the melt that the failed bar represents, and the other four melts of the group shall be tested individually.

(*b*) If there is a period of more than six months between shipments of the class of castings covered by these specifications, then each melt shall be tested individually until 15 consecutive melts have been accepted, after which the melts may again be grouped as in Paragraph (*a*).

(*c*) If one or more melts are rejected, each succeeding melt shall be tested individually until 15 consecutive melts have been accepted, after which melts may again be grouped as in Paragraph (*a*).

12. If the results of the physical test lot do not conform to the requirements specified, the manufacturer may re-anneal such lot not more than twice and retest shall be as specified in Section 8.

(*Continued on page* 321)

Value of Accident Investigations

Need of Studying Each Case in a Methodical Way, Thus to Prevent Recurrence—Meeting the Variable Human Factor

BY H. P. HEYNE*

LIKE any other work, accident prevention activities should be conducted in a systematic manner if they are to be successful, both from the humanitarian and economic viewpoint. Too much stress cannot be laid in the section of safety engineering which deals with accident investigations, as corrective measures or methods are the outcome of the results of the investigations if conducted in a thorough and impartial manner.

Need of Ascertaining Causes

Each accident involving loss time should be thoroughly looked into, together with injuries where no time was lost but which might have been serious. The idea of an investigation is that one accident will prevent another by removing the cause, which eliminates the effect.

Each injury, whether trivial or one causing loss of time, is reported to our emergency hospital, by having the foremen render their reports. A foreman may state on his report that the "man had first finger of right hand lacerated by having finger caught between slabs." It may be true that the injury occurred in this manner, but we aim to get after the "why and how" of the injury, and also what should be done to prevent a recurrence. Without a thorough investigation, in a case similar to the aforementioned, one would not know whether the slabs were improperly piled; handled in an unsafe manner by crane operator; fellow workman pushing slabs over with the one on which the man was working; slab may have toppled over, and a host of other questions may present themselves, and still one would not know the real cause, such as the predisposing, contributing and immediate causes for the injury.

Procedure in Studying Accidents

In cases of lost time injuries, we visit the scene of the accident together with the department superintendent and foremen and members of the safety committee in the department, and make a thorough survey of all surrounding and existing conditions, such as the machinery or equipment, method of performing the work, and material employed in the work, in order to get the scene firmly impressed.

Witnesses are interviewed and must make true statements, and not conceal any facts, so that one may get to the root of the trouble. Each witness to the accident is personally interviewed.

After the statements have been secured, a meeting of the investigating committee is called, which is composed of the department superintendent and foremen of the division where the injury occurred, also members of the safety committee. The information as furnished by each witness is gone over in a thorough manner and discussed, also a discussion by the committee of our previous visit to the scene of the accident, whereupon the committee renders an "investigation report" which is signed by the members of the committee. The report brings out the results of the investigation as to what or who was at fault for the accident, also as to what must be followed in the future to prevent a recurrence.

A copy of the witnesses' statements and the committee's report is forwarded to the general manager, general superintendent and department superintendent and a copy is retained in the permanent files of the safety department.

It will be observed that by having a full and complete record of accidents the papers serve their purpose. All department heads may become familiar with the cases which might bring up matters in other departments to be corrected, or result in closer observance over the men, with instructions that they pay particular attention to certain matters or conditions.

The papers may be brought into use when conducting departmental meetings among the working men, for they will eagerly absorb the information which causes them to think, talk and act safely, because the instances are driven home.

The time consumed in drawing up statements in a business-like form;—attacking the accident from different angles,—is well spent, in that each case is recorded in a detailed manner so that future reference may be made to each case. Also there is the psychological effect the investigations have upon the men, which in due time results in a reduction of injuries and finally the economic saving to the employer.

Disciplining of Employees

When an employee is injured through ignorance or lack of forethought on his part or that of a fellow working man, it is well to consider whether the best interests of the company demand his dismissal or lay off, for the employee has to be replaced by a less experienced man, which does not help matters any, and increases the accident exposure and the cost of labor turnover, which is reflected in decreased efficiency of the new worker.

It may prove more effective to demote the employee at fault and to insure that he and others may know why such action was taken, which fact would tend to make the men think before they act.

Our records show that 57.4 per cent of the injuries occurred to employees who were in our service for periods less than six months. Dismissal of an employee may be necessary in cases where a shop rule or instruction was violated or for wilful negligence or intent, which caused the accident, but an impartial hearing should be given the employee before final dismissal.

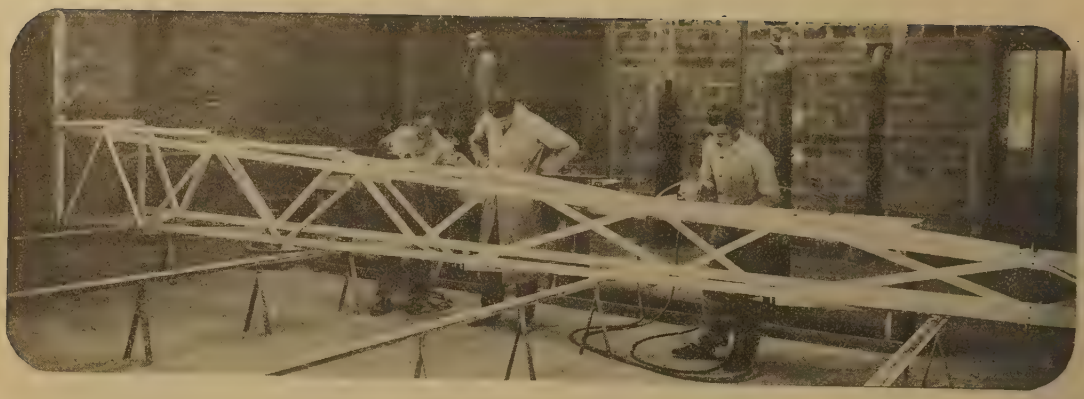
Safety engineering involves the human element, and might be termed the study of human nature, for no two persons are alike, and problems are presented each day which differ from the preceding cases of similar nature. It is a branch of work in an establishment which must be conducted along scientific lines in order to get results.

*Safety inspector, United Alloy Steel Corporation, Canton, Ohio.

German Process for Soldering Aluminum

WASHINGTON, Aug. 1.—Attempts are being made by the German inventor of what is said to be a new process of soldering aluminum to sell the American rights for $5,000 and the rights for all countries for $30,000. Carl Barthels, Heidelberg, has been commissioned, according to a report received by the Department of Commerce from Consul Moorhead, Stuttgart, Germany, by the inventor to sell the rights to the patent. It is stated that the solder has been tried by German manufacturers and that it has proved satisfactory. It is claimed that the process simplifies the soldering of aluminum both pure and in connection with other metals, such as tin, zinc, copper, etc. The so-called advantages are declared to be simple application with the soldering iron, without any liquid soldering agent, firm union of the edges soldered and permanency, no matter how much the soldered seam may be exposed to pressure, bending and pulling.

At Charleroi, Pa., the Electric Alloy Steel Co. is operating its property on a basis close to usual production.



Protective Coatings of Sprayed Metal*

Late Developments With the Schoop Process Abroad—Examples of Applications and Operating Features—Spraying Pistol Operated Electrically

BY ROBERT G. SKERRETT

SPRAYING molten metals to form a protective coating was looked upon a decade back as little better than a laboratory achievement of trifling practical value. To-day, thanks to the persistence of M. U. Schoop of Zürich, Switzerland, apparatus and methods have been devised that make metal spraying for this purpose of wide commercial usefulness. The latest reports of every-day performances reveal how effectually the inventor has surmounted the techinal obstacles which beset his path; and his longest strides forward have been achieved in the last five years. To-day, in Europe, Schoop metal-spraying equipments are employed extensively in depositing coats or films of zinc, lead, aluminum, copper, tin, etc.

Broadly stated, his different processes depend upon the generation of sufficient heat to melt wires or powdered metal and then to project the molten particles forcibly by a blast of compressed air. The velocity of the atomized metals suffices to cause them to adhere, by reason of their impact, to the receiving surface and also to insure their uniform distribution. Whether the metal is used in the form of a wire or a powder depends upon the nature of the metal, its price and the service for which it is intended. For instance, abroad, powdered zinc is obtainable in abundant quantities as an industrial by-product, and is therefore much cheaper than zinc wire. A so-called pistol is the medium by which the metal is made molten or plastic and projected against the body or surface which is to be coated.

The powder-spraying pistol has much to commend it, and by reason of its simplicity of construction it has won approval among industrial users, inasmuch as little training is required to qualify a workman to manipulate it satisfactorily. The powdered material is fused by a gas flame. The pistol is equipped with a magazine or small container charged with the metallic dust or powder, and this material is forced out of the reservoir by compressed air and carried by the air stream through the melting flame. The air pressure is regulated so that its impulse will be strong enough to drive the incandescent particles against their target. This manual type of apparatus has no movable parts, such as are essential to feeding the wire in the pistols designed to handle metal in that form, and is largely employed for zinc or tin coating.

Quantity galvanizing and tinning of small articles is done by means of the powder-spraying pistol associated with another mechanical feature. The products to be treated are loaded into a revolving drum, equipped with a series of spiral ribs, which continually turn the contents and bring every surface of each piece into the path of the atomized metal. The pistol is mounted upon an oscillating shaft, and the motion of the latter serves to distribute the spray and to insure the complete coating of the manifold tumbling bodies. Of course the wire-spraying pistol can be adapted to this machine.

The electro-pistol is a late evolution of the Schoop metal-spraying processes. Instead of a gas burner, an electric arc is relied upon to do the melting, and the intense heat of the arc makes it practicable to deal with such refractory metals as molybdenum and wol-

*This article, based on European information, does not refer to developments of the Schoop process in the United States under the control of the Metals Coating Co. of America, 495 North Third Street, Philadelphia, which has issued a profusely illustrated pamphlet for this purpose.

Bolts and Nuts Which Have Been Galvanized in Quantity by the Schoop Metal Spraying Process

fram, in addition to the metals already mentioned. The adoption of the arc, however, imposed important modifications in the apparatus. As is well known, electrothermic heating, especially when using the lighting arc as a source of heat, permits the generation of the highest-known temperatures within any desired limited area. But the usual electro-thermic melting cycle cannot be applied to the fusing of metals for spraying, because of the difficulties of maintaining a uniform flow of the metal and the impossibility of preventing the clogging of the channel through which the necessarily fine stream would have to be fed to the blast of compressed air.

This problem has been met as follows: Instead of a miniature furnace, Schoop has substituted a self-melting arc which is induced between two terminals formed of the wire to be sprayed. These wires are kept at an arcing distance from each other, and as they are fused, and then atomized by the blast of compressed air, compensation is effected through the agency of an air-driven mechanism. In earlier forms of the pistol a pneumatic turbine making 27,000 r.p.m. was relied upon to feed the wires, but a simple Pelton wheel has now been adopted which runs at a velocity of from 4000 to 5000 r.p.m. By means of suitable gearing, the speed is reduced so that the advance of the opposing electrodes is just fast enough to offset their consumption. The heat generated at the arc is prevented from spreading into the mass of the pistol by the cooling action of the discharged compressed air.

The electro-pistol is operated by current of from 20 to 30 volts, at from 40 to 70 amperes; and spraying the metal calls for an expenditure of about 18 cu. ft. of compressed air per minute at a pressure of 50 lb. per sq. in. In earlier models of the Schoop pistols, air at a pressure of 100 lb. was employed. By reducing the pressure to 50 lb. there is a distinct technical gain, inasmuch as there is less chilling of the atomized particles; and this promotes adherence and a more intimate union with the texture of the supporting mass. Each wire is advanced at the rate of from 5 to 13 ft. per min., depending upon the nature and the size of the wire.

The quantity of metal that can be deposited in the course of an hour depends, of course, upon the kind of metal handled. The results may be broadly stated as follows:

Zinc, sprayed at the rate of 6½ lb. per hr., will cover a superficial area of 65 sq. ft. to a thickness of 0.0002 in.
Tin, sprayed at the rate of 13 lb. per hr., will cover a superficial area of 43 sq. ft. to a thickness of 0.0008 in.
Lead, sprayed at the rate of 22 lb. per hr., will cover a superficial area of from 20 to 30 sq. ft. to a thickness of 0.002 in.
Aluminum, sprayed at the rate of 1 lb. per hr., will cover a superficial area of from 30 to 40 sq. ft. to a thickness of 0.0012 in.

In the case of multiple galvanizing, by the machine already described, it is entirely practicable to coat a charge of 650 lb. of bolts and nuts, for instance, within an interval of 20 min.

The principal use of the metal-spraying process is for galvanizing, and its employment in this field will be the most conspicuous of its applications for some time to come. About three years ago the Swiss federal railroads introduced this system of galvanizing, and have thus coated the transmission towers, etc., of the electrified St. Gothard line. Both the German and the Swiss railroads have so protected the frames of their cars—especially coal cars exposed to the corrosive action of sulphur washed out of the fuel by rain or melting snow.

Latterly, the French have galvanized the transmission towers of the Midi road; and these towers were zinked in this way without any interruption to traffic. A number of bridges have been galvanized in this manner by recourse to portable outfits; and the parts of these structures directly in the path of the smokestack exhaust of steam locomotives have been further shielded from erosion by a supplemental film of lead deposited by the same apparatus. In the climate of Switzerland the sprayed-on metal will last anywhere from 18 to 20 years. In Italy, two coats of paint are being saved by metallizing wood with zinc and afterwards covering the deposit with a coat of paint.

During the world war, the Germans made a practice of spraying aluminum upon the grate bars of their locomotives, and they found that the protecting film measurably reduced wear and tear. The aluminum seems to screen the bars from the action of the furnace gases, and incidentally prevents scaling of the iron and the adherence of slag.

It is not possible within the limits of the present article to more than hint at the many ways in which Schoop metal-spraying pistols are being utilized. In Switzerland alone no fewer than 250 establishments are licensed and equipped to operate these tools, and with them the shops are coating a wide range of products. For example, iron containers for chemical plants are coated with aluminum, lead, or copper; iron calenders for textile works are sprayed with brass; centrifugals used in the manufacture of guncotton are protected with aluminum; porcelain insulators are surfaced with copper; Pelton wheels are thus overlaid with lead to arrest the erosive action of sand and pebbles; and paper and fabrics are extensively metallized for all sorts of purposes. Telephone cables, etc., instead of being wrapped first with paper and then with zinc foil, are now insulated with a single wrapping of zinc-coated paper. No mention has been made of the purely decorative or art fields in which the Schoop metal-spraying pistols can be employed.

Colorado Steel Works Operations

President J. F. Welborn of the Colorado Fuel & Iron Co. makes this statement concerning the company's business in the July 15 issue of its *Industrial Bulletin:*

"Operations at the steel works and coal mines during the last three months have been at a fairly satisfactory rate for that time of the year, yet the volume of business done at the low prices made necessary by keen competition has not been sufficient to pay all direct charges and take care of depreciation. Operations for the quarter ending March 31 returned a loss of $431,-268.53. Statements of earnings for the first two quarters of the year are published elsewhere. An analysis of these statements shows that after paying wages of employees the receipts from business done during the first six months of this year were barely sufficient to meet the other necessary charges for conducting the business, such as freight on raw materials, cost of supplies, interest on borrowed money and taxes, leaving less than half the amount necessary to take care of depreciation for the period. Obviously, in this half year the stockholders received nothing from their investment in the business.

"Business in the coal department promises well for the next few months, although the demand is not abnormal and there has been no enlargement of the territory in which our coals are marketed as a result of the strike elsewhere.

"Orders for wire, nails, merchant bars and other products of the small mills are at a rate slightly less than our capacity. The prospects are that this business will not decrease in volume during the next few months, and it may increase.

"We have made no sale of heavy rails in recent months, and our rail orders will be completed in the near future when in all probability the rail mill will have to close down for a period. This will, of course, necessitate some curtailment in production of coke, pig iron and ingots, and reduce coal shipments to the steel plant."

Changes in Cost of Living

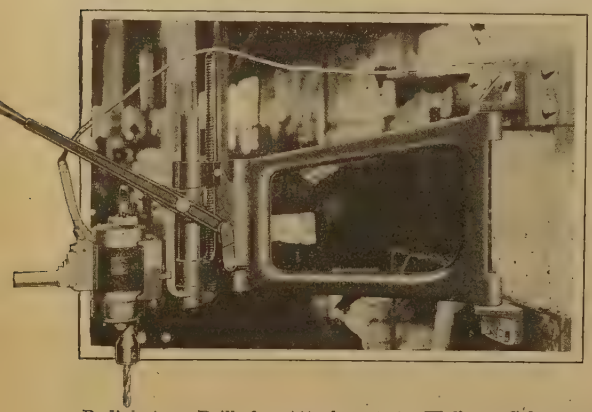
Changes in the cost of living for June, as determined by the U. S. Department of Labor through the Bureau of Labor Statistics, show that the cost of living was 66.6 per cent higher than in December, 1913, 23 per cent lower than in June, 1920, and two-tenths of one per cent lower than in March, 1922.

Furniture continues to be the highest item in the cost of living, standing 102.9 per cent higher than in 1913. Food, the largest item in the family budget, is 41 per cent above 1913; rents are 60.9 per cent "up" and clothing 72.3 per cent.

Millwrights' Radial Arm Drill

A radial arm drill of the type illustrated, intended especially for use in connection with the work of millwrights and maintenance men, has been placed on the market by the Van Dorn Electric Tool Co., Cleveland. It is attached to the wall or column and the arm and drill cover a radius of 31½ in. from center to wall pivots. The auxiliary forearm permits a secondary radius of 10½ in., to be swung for locating the drill.

The electric drill proper is incased in an aluminum housing and arranged for quick disassembly for greasing and cleaning. It is well balanced, convenient to handle in almost any position, and the light weight of the machine as a whole permits easy moving to various locations in the shop. The motor is of the universal type for either alternating or direct current and is ventilated by an aluminum fan on the rotor shaft. The drill chuck provided permits the use of drills up to ⅝ in. diameter for work of iron or steel; larger wood bits may be used.



Radial Arm Drill for Attachment to Wall or Column. The radius covered, from center of drill to wall pivots, is 31½ in. Drills up to ⅝ in. in steel may be used

In the radial arm the weight is distributed to give the strength and rigidity necessary to withstand heavy duty and the design permits of an easy swinging motion of the arm for quick location of the drill. The arm is supported by the pivoted brackets, as shown. At the opposite end of the main arm casting there is a second pivoted joint on which the short forearm swings and the outer bearings of the forearm form a support and guide for the drill bracket. The forearm is intended to give flexibility to permit quick and accurate location of the drill.

The drill bracket or sliding member is raised and lowered by means of a long lever and toggle-link mechanism. A secondary drill-lifting arrangement is also provided in the form of a strong tension spring attached to the lower part of the drill bracket and hung from an extension rod above the forearm. The drill is attached to the radial arm by unscrewing one handle and bolting the drill to the adaptor plate on the radial arm. Less than a minute is said to be required to attach or detach the drill.

Large Orders for Springfield Plants

SPRINGFIELD, OHIO, July 31.—The Armstrong Brothers' Mfg. Co. is turning out from 1000 to 1200 castings for incubator heaters each week. It has an order for 50,000 heaters from the Buckeye Incubator Co., which has many domestic and foreign orders. Archibald Bell of Harbley, France, European representative of the latter company, who has been here for two weeks, left a large order with the incubator company.

A survey made by the Chamber of Commerce shows that out of 18,000 employees used in the local plants normally, 74 per cent are working 5½ days per week and the rest three days a week. Manufacturers say the coal supply here will last from 60 to 90 days and that rail shipments outbound are good. Inbound shipments of supplies are not coming so well. The delay is partly due, it is stated, to a rush of orders at the supply plants.

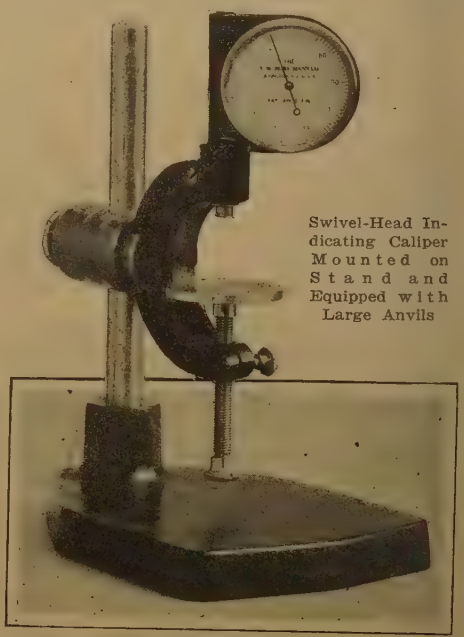
As a result of an order for 25 locomotives placed by the New York Central Railroad with the Lima Locomotive Works, the plants of Ohio Steel Foundry Co., this city and Lima, are working good sized forces of men, according to announcement of Works Manager T. H. Harvey.

Swivel Head Indicating Caliper

An indicating caliper the head of which swings a full circle about the plunger, permitting of easy reading of the dial from any position, has been brought out by the F. W. Horstmann Co., Irvington, N. J.

The head will stay fixed in any position and without the use of clamps. The instrument is set to a sample in the same manner as in the company's regular type, the sample or gage being set with the hand on the zero mark and the back stop arranged so that the work is centrally located on the contact points. The dial is graduated in thousandths of an inch. Six sizes, from 1 to 6 in. capacity, are available and each size has a range of 1 in.

A stand can be provided in which the tool can be clamped in either a straight or tilted position, and held perfectly rigid and although heavy enough for the usual work the stand is provided with two holes in the base for fastening to a bench or table. The instrument can be equipped with larger anvils for use with the caliper and stand combination.



Swivel-Head Indicating Caliper Mounted on Stand and Equipped with Large Anvils

Mixed Coal and Coke for Water Gas

Results obtained by W. J. Dunkley, gas engineer of the Bureau of Mines, in the course of experiments made at Ottwa, Ill., in the use of mixed coal and coke fuel for water gas manufacture, show that capacities up to 97 per cent of the rated capacity with good coke fuel can be obtained, using 70 per cent Illinois coal and 30 per cent coke from Kentucky coal, with 6 ft. gas sets operating up to 10 hr. per day. The generator fuel consumption was about 33.5 lb. of mixed fuel per 1000 cu. ft. of gas made.

Experiments on the treatment of lignite, raw and carbonized, by the Trent process, are being made in North Dakota by W. W. Odell, fuel engineer of the United States Bureau of Mines. Construction of a vertical lignite carbonizing oven has been completed.

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Shall Autocracy Succeed?

The air has been full of strike settlement talk in the past week. In the coal strike the miners' leader has said confidently that a national conference between operators and union miners was near at hand, but there has been little to corroborate this view or to indicate early resumption of work by the strikers. In the railroad strike, from many directions have come the prediction of an early return of the shopmen to their work under a settlement made at the President's instance and involving concessions by both sides.

For more than a week Government and unofficial comment has pointed to the seniority question as the only real bar to the calling off of the railroad strike. In fact, a plan was said to have been proposed by the President under which the railroad employees who stayed at work would have preferential treatment, while next would come the returning strikers, and last the men who had taken the strikers' places. The urging of various editorial writers in the daily press that with a compromise in sight on all but seniority in service, that issue must not be allowed to prevent a settlement has plainly implied that the railroad executives should recede from their stand on this question. With entire justice the president of the New York Central has replied, "It is the solemn duty of the roads to be loyal to the men who were loyal to them." And another railroad president has said: "It is not an academic question. We have given our word of honor to the new men, guaranteeing their seniority over old men coming back." Still others have pointed out that they were triply bound to protect their new employees —first, morally; second, by written contract, and third, by the decision of the Railroad Labor Board to rank new men immediately after old men who remained loyal.

At this writing conferences are still on, and it is not known to what extent the men who came to the help of the railroads and of the whole people are to be sacrificed to the demands of those who set at nought the decisions of the Government, expressed through the Railroad Labor Board. As the President wrote to J. Cleve Dean, and in so writing sent an unequivocal message to the Lewises, the Jewells and all the incendiary leaders of organized labor who have expressed contempt for the Administration in this most grave crisis, "there can be no Government unless its mandates are accepted by the citizenship of the Republic." Yet in the proposed settlement the country is called on to see a practical reversal of the finding of this same Railroad Labor Board on the status of the men who tried to stop the wheels of transportation and bring industry to a standstill. It is true that the compromise proposal, in sending certain demands of the strikers back to the labor board for rehearing, compels the union to recognize the authority of that body, but that recognition should be demanded as of right and not bought by a sacrifice of principle.

The most serious thing about the double strike situation is not that transportation may be crippled—though, in fact, leading railroads are in a fair way to defeat the strikers completely; nor even that the country may be in the grip of a fuel famine in the coming winter. What is of the gravest concern is that a law-defying labor autocracy is in a fair way to succeed in its coercion of the "loyal and law-abiding citizenship," that overwhelming majority of the American people to whom the President has made his appeal in this critical time.

Without adopting the language John L. Lewis applied to the non-union workers at Herrin, Ill., when he advised that they be "treated like ordinary strikebreakers," the Administration's seniority proposal practically puts the men who have saved the railroad situation in the past month in that very category.

Apparently the country took too much satisfaction from the repeated defeats of union autocracy in 1919. First a courageous Governor made it plain at Boston that there was no room in a democracy for labor union imperialism; and later in the same year, when the coal miners tried to impose their will on the whole people, they got the same answer. Last of all came the railroad brotherhoods, with their threat to strike against the Government; but after sounding out the popular temper they wisely decided not to make war on the American people.

Three years have passed, with industry depressed for more than half the period, and many

adjustments have come both in wages and in commodities in response to a widespread demand for relief from the heavy burdens of war-time prices. Yet here are two classes of workers that have defied the Government and with lawless disregard of the rights of others have set out to force the Government to accept their will. Why should the American people, who in 1919 were able so decisively to check union autocracy, be forced now to compromise on an issue involving the ability of the Government to compel respect for its findings? What can come from such a compromise but encouragement to law-breakers and more power to superior force as the labor court of last resort?

Steel in Dwelling Houses

In recent months there has been remarkably great activity in the erection of dwelling houses, and it is to be regretted that conditions were not ripe for this unusual opportunity to be embraced for the introduction of steel in the framing of these buildings. From all angles this substitution, long predicted and certain to occur some time, would be advantageous. The steel industry would be glad to have this additional outlet for its steel. The owner of the building would be much better satisfied, since he would have a more durable building. The occupant would feel safer and be more comfortable. The general public would be advantaged in fire losses being reduced in the long run and insurance rates coming down in consequence.

Without entering into details, it may be remarked that steel sections to replace wood joists and studding and wood or brick outside walls have reached a point, so far as the section is concerned, where there is much to commend them. It is recognized that perfection has not been attained in distribution of metal to give the greatest stiffness for a given weight; but considering the whole problem of the substitution of steel for wood much more progress has been made in this part of the problem than in its other parts.

From the practical viewpoint, the greatest barrier to the general use of steel in this connection in place of wood is the training and habits of those who are engaged to build houses. The carpenter has his plans and dimensions; but in practice he does most of his cutting of wood, not to fit the plan but to fit such parts of the building as he has already managed to construct. This he cannot do with steel. The carpenter has practically no initiative even when working with wood. Although houses have been framed for generations, practice has not been standardized, and if carpenters have not arrived at a common, and best, method of performing simple operations in wood it is plain that the substitution of an entirely different material is a serious matter.

Apart from the personality of the individual workman, there is the great difficulty of the building trades being what is called "organized," which means, among other things, "jurisdictional disputes," which arise now from the most trivial causes. A given form of roofing, for instance, requires a different craft according to the angle. One craft lays it on the roof, another lays it when it goes on the vertical side wall.

It is hard enough for the individual owner to get his house built when he strives to follow the beaten path. He is unlikely to attempt something altogether new. The hope of steel must lie in the investment builder, the capitalist who builds large numbers of houses as a business. An entirely new machine for building houses will have to be created. There is no chance simply to make a substitution of the one material for the other. One can substitute wall board for plaster, or metal lath for wood lath, or steel conduit for loom, without a great deal of difficulty, but substituting steel framing for wood framing is fundamental. It is not a mere matter of the steel industry offering the product. In essence a whole consuming industry will have to be built up.

Buying Power the Test

Efforts to prognosticate the course of industry may usually be aided by comparing the expectations of the past with what has developed, so as to observe the tendency to error. It is helpful, therefore, to compare the condition of the export steel market now existing with the predictions that were being made during the war. It was the common prediction that after the war the demand for steel would be world-wide and of unprecedented proportions. The world would have grown very short of steel, would have accumulated new "needs" and would be "hungry" for steel. In some quarters, however, fears were expressed that the American manufacturers might be at a disadvantage in export trade on account of high costs.

The record of three and a half years of post-war steel demand is now available. In 1919 and 1920 iron and steel exports of the United States were greater than in the two years before the war, by approximately one-half, while exports in 1921 were 23 per cent less than in 1912-13, and this year they have been running at about the 1921 average.

British exports of all iron and steel products have been as follows: First half 1921, 879,130 tons; second half, 856,436 tons; first half 1922, 1,625,635 tons. Deducting, for the first half of this year, exports of scrap, pig iron, castings, etc., there is left about 1,200,000 tons of regular steel mill products. Our own production of finished rolled steel in the first half of this year was about 12,000,000 tons, representing about 60 per cent of the productive capacity.

If, therefore, the American steel industry had had all the export steel business in the first half of this year that fell to the British producers, the result would have been a 66 per cent operation instead of a 60 per cent operation. Our beating the British would have helped very little to engage our increased capacity.

The error made during the war—an error frequently made—was that of taking it for granted that imagined "needs" will be satisfied. Buying power is the real factor. If buying power is lacking needs that are very pressing will not be satisfied. If there is buying power and no pressing needs, needs that are not pressing will be satisfied. If

there are no needs at all the money in all probability will be spent anyhow.

It is the same with the consumers of the United States as with consumers in other countries. For trade to be active, buyers must be able to buy. They will always discover needs or wishes if they have the buying power. As a rule it is not a favorable symptom for a class of people to appear to be in great need of material or equipment. Such a condition is symptomatic of an inability to buy. In the case of our railroads, for instance, should they in a natural way make large purchases during the next two years their having done so would in itself furnish no suggestion that they were then going to stop buying. Judicious expenditures would reduce operating costs and improve earnings, whereby the railroads would have better credit and there would be greater opportunity to make further improvements, conducing to more economy. It is the prosperous and progressive industry, not the industry that is out at the elbows, that makes a promising customer.

CORRESPONDENCE

Progress in Open-Hearth Process

To the Editor: I read with considerable interest the article by Willis McKee, on "Progress in the Open-Hearth Process," which appeared in the July 20 issue of THE IRON AGE. Having held supervisory positions in three major departments of the steel industry I can realize the possibilities which the proposed layout has to offer. The relations of all the important developments to each other are well co-ordinated and the construction, as suggested, will not be an experiment. It will be a combination of features which have long since been worked out in a practical way.

While the question of refractories is not solved to complete satisfaction, it is because the refractories which will solve this problem have not had the opportunity of trial. When the atmosphere of the open-hearth can be maintained strictly oxidizing or at least neutral, the refractories will be supplied. With the present furnace port arrangement this is impossible, but will be corrected earlier than expected.

The development of silica brick for furnace roofs has no doubt reached its limit. The roof of the future will probably be constructed of brick made from blends of aluminous clays. At the present time brick from these mixes are produced which will resist higher temperatures than silica. They will not spawl, they have greater strength at both atmospheric and high temperatures, but are somewhat affected by carbon deposition.

Aluminous clay brick are now being used with success in the electric furnace, but are not entirely suited to the open-hearth on account of the limitations set by present open-hearth construction which carries with it poor combustion and carbon deposition.

During the winter the writer made an investigation of the possibilities of open-hearth checker insulation. The saving effected would vary from practically nothing to a point which would materially affect the furnace operation, depending upon the plant considered. It would be economical to enclose the checker chamber in a steel jacket, as suggested by Mr. McKee, if only for the saving of heat effected by insulation, letting alone the great possibilities to be obtained by delivery of the gas and air under pressure. The old idea is that insulation would cause the checkers to burn out; this is wrong. Burn your gas in your furnace and the checkers will take care of themselves. Burn the gas in the furnace and the checkers will have reserve power to do work, and waste-heat boilers will become unnecessary.

It is not because the bulk-head of an open-hearth furnace gets so hot that it burns out rapidly; it is the principal effect of carbon deposition at high temperatures. The proposed new arrangement will largely solve this problem.

C. L. T. EDWARDS,
Laclede-Christy Clay Products Co.

Chicago, July 26.

STEEL PRICES AND MERGERS

Western Consumers Send Statement to the Trade Commission

CHICAGO, July 29.—W. E. McCollum, secretary of the Western Association of Rolled Steel Consumers, sent to the Federal Trade Commission at Washington to-day a statement calling attention to "the intimate connection between the Pittsburgh Plus and the steel mergers which are now under investigation by your commission." The statement refers to the condition created in the steel market in February, 1921, when one of the Eastern independent companies announced that it would make such prices as would attract tonnage to its mills regardless of the prices quoted by other mills. "Such prices were made and trade publications show that they were commonly $5 per ton less than prices quoted by the United States Steel Corporation." The statement then says:

> The Western independent mills were compelled to meet these prices, with the result that before the close of the year prices in the Chicago district on plates, shapes and bars receded to a practical level with those prevailing in Pittsburgh, and for the first time in nearly twenty years—over any considerable period—the Pittsburgh base on plates, shapes and bars had vanished, so far as Chicago competition was concerned, although on other products it remained. This, however, was not the result of free competition, but of necessity, born of a time when certain mills pursued the policy above indicated with respect to price.

Mr. McCollum went on to say that "with the only independent mill in the West which rolls a complete line controlled by its Eastern connections, as will be the case if the merger is consummated, the perpetuation of the Pittsburgh Plus, or some similar arrangement, seems to us inevitable. This mill has within a generation grown from nothing to a large and rich organization—it is probably the most successful enterprise of its kind—and it can safely be assumed that its economical operation does not depend upon its merging with some of its Eastern competitors." In conclusion the statement says, after suggesting that the Federal Trade Commission make inquiry into costs of production at various points:

> Our concrete suggestion is that the attorneys in all of these several cases be requested to bear the issues in both cases [the Pittsburgh Plus and the merger cases] in mind and to seek to develop in each case anything that may be important in the other, and to exchange information with a view to getting all of such facts into the record in the Pittsburgh Plus case. In short, we believe that such information relating to the price of steel, the methods of fixing the price, the fairness or unfairness of price, the discriminatory character of price, the practice of Pittsburgh Plus itself and its economic background will normally be developed in the progress of the merger cases, which might not, or perhaps even could not, be developed in the normal progress of the Pittsburgh Plus case within its present scope, and that advantage should be taken of the opportunity presented by the pendency of the merger cases to get such facts into the record in the Pittsburgh Plus case.
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> We believe the situation presents an extraordinary opportunity to the commission for strengthening its case under the complaint in the action against the United States Steel Corporation, and we sincerely trust that the greatest advantage will be taken of such opportunity.

EXPORT BUSINESS QUIET

Light Rail Buying by Japan—Chinese Copper Imports Heavy—German Material in Manchuria

NEW YORK, Aug. 1.—The Japanese market shows slightly less activity and the Chinese market is still dull. There is still some small buying of light rails by Japan. One exporter recently sold a tonnage of 32 miles of 12-lb. rails to a private interest and is handling an inquiry for 16 miles of 35-lb. rails from the Division of Forestry, Formosa. There is also some inquiry for locomotive boiler tubes. Black sheet purchases have fallen off slightly.

In China, although there is no importation of material, the market is fairly active through sales of merchants, who in order to realize cash on their stocks are undercutting the market, resulting in lower prices. Transactions with buyers in the Philippines, although not large, continue highly satisfactory. One exporter dealing with the Far East, has booked orders during the past two or three weeks from buyers in the Philippines for 5500 kegs of nails, about 145 tons of 35-lb. rails and 1500 reels of barbed wire, 85 lb. to the reel. Despite the uncertainties that have prevailed in the political situation in China for many months, imports of copper ingots by Hankow from the United States and Japan have been unusual. From Jan. 1 to May 19, this year, imports totaled 12,847,000 lb. from the United States and 4,706,000 lb. from Japan and other foreign ingots shipped through Shanghai 1,177,000 lb. These figures compare with 14,441,333 lb. of copper ingots imported from the United States and other countries into Hankow in 1921 and 10,950,133 lb. imported from Japan in 1921. These figures are submitted by Consul General P. Stewart Heintzleman, Hankow, China.

It is reported from Manchuria that imports of German material are increasing through the port of Dairen. In 1921 imports from Germany amounted to 1,573,311 gold yen, compared with 48,505 gold yen in 1920 and at the current rate of importation this year's figures will show a decided increase over the figures for 1921. The chief imports in 1921 were iron and steel manufactures, electrical appliances, machinery, medical instruments, locks, etc.

CZECHO-SLOVAK STEEL INDUSTRY

Iron and Steel Capacity of the Country—Present Rate of Operation—Exports and Imports

In a recent report to the Bureau of Foreign and Domestic Commerce, Trade Commissioner Vladimir A. Geringer, at Prague, Czecho-Slovakia, describes specifically the situation and capacity in iron and steel production of Czecho-Slovakia. The report says in part: "Of the 47 blast furnaces in the former Austro-Hungarian Empire 27 are in Czecho-Slovakia—10 in Bohemia, 8 in Moravia, 3 in Silesia and 6 in Slovakia. The total annual capacity of these 27 blast furnaces is approximately 1,500,000 metric tons. Since the beginning of March, 1922, five blast furnaces, representing about 27 per cent of the total capacity, have been in operation, producing about 1100 tons of pig iron daily. Need for the waste gas is the reason given for keeping two of these furnaces active. The Prague Iron & Steel Co., which owns eight furnaces, operated none of them from July, 1921, to March, 1922, and then put in operation one furnace when it succeeded in securing cheaper coke from Germany. It is estimated that in January 25,000 metric tons of pig iron, in February 23,000 tons, and in March 34,000 tons were produced.

Rolling Mill Products

There are in Czecho-Slovakia 42 stationary open-hearth and 3 Talbot open-hearth furnaces, and 5 Bessemer converters, the total annual capacity of which is estimated to be 2,000,000 tons of steel. About 20 to 25 per cent of the steel furnaces are believed to be in operation now, as compared with some 40 per cent in December, 1921. In 1921, 917,662 metric tons of steel of various kinds were produced—75,742 tons of Bessemer steel (8.25 per cent of the total output for the year), 820,995 tons of open-hearth steel (89.47 per cent). 3772 tons of puddled steel (0.41 per cent), and 17,153 tons of electric steel (1.87 per cent of the total). Compared with the 1920 production of 972,976 tons, the 1921 output declined by 6 per cent.

The 16 steel rolling mills of Czecho-Slovakia have a total normal capacity estimated at 2,000,000 to 2,500,000 tons a year, but this production can be substantially increased if business conditions should demand it. Approximately 15 to 20 per cent of total capacity is now being operated. Seven of the largest rolling mills also own coal and iron mines.

Among the chief products manufactured are steel and iron bars, shapes, wire rods, iron hoops, iron or steel strips (hot or cold rolled), girders, beams, angles, T-columns and posts and other structural shapes of iron or steel, rails, splice bars and other track material, sheets and plates of iron and steel, galvanized sheets, tin plate and wrought iron pipe. The output for 1921 was considerably smaller than that for the previous year.

In the last quarter of 1921 the production of the Iron and Steel Combine amounted to 97,800 tons and in the first quarter of 1922 to 56,400 tons. It is believed that the contraction represented by these figures holds true of the operation of other concerns. The reason is said to be the appreciation of the Czecho-Slovak crown and the depreciation of the German mark, whereby the competitive ability of the Czecho-Slovak steel mills has been reduced. While in January, 1922, the steel rolling mills operated at about the same capacity as in December, 1921, completing orders previously received, their operation in February and March declined about 30 per cent. Judging from the orders that are being received it is expected this slowing down of operation will continue.

Majority of Products Exported

"Local iron and steel plants export from two-thirds to three-fourths of their products. This is because over 55 per cent of the pig iron output of the former Austro-Hungarian Empire is in the territory of the Czecho-Slovak Republic, whose consumption of iron and steel is estimated at 600,000 metric tons annually, while the production capacity is four times as great."

In the portion of the report dealing with exports and imports of iron and steel, it is pointed out that the heaviest imports of pig iron, spiegeleisen and ferroalloys, which totaled 11,116 tons in January of this year, were from Germany, which furnished 6,650 tons. Exports of pig iron, spiegeleisen and ferroalloys in January were 2824 tons. The report continues: "Importation of pig iron from Lorraine and England has been growing recently because it is considerably cheaper than buying domestic iron, notwithstanding transportation costs and customs duties. The circumstance that pig iron is also exported from Czecho-Slovakia can be explained by the fact that the Vitkovice Mining & Iron & Steel Co., which manufactures pig iron principally for sale, has its natural markets in Poland and Austria, and would rather maintain those markets even at a loss than to sell at home, which would probably cause a damaging decline in domestic prices.

Not an American Market

"France, Sweden, Denmark, Portugal and Great Britain sent chiefly pig iron, while shipments from the United States were highly manufactured products. There is no possibility of importing iron and steel from the United States under present conditions, especially in view of the low value of the German mark. Furthermore, American exporters would have to adjust their prices to German, English and Lorraine prices. The English iron, considering its quality, is regarded as a very good purchase." Exports of iron and steel from

Czecho-Slovakia, amounting to 16,575 tons in January, were chiefly distributed among Austria, Germany, Hungary, Poland, Jugoslavia, Rumania, Great Britain and the United States (24 tons). Much of the iron and steel shipped to Germany was re-exported to other countries.

Notwithstanding the estimated annual capacity of the country for iron ore, considerable quantities must be imported. In 1921 imports of pyrite, iron ore, manganese ore and others totaled 564,672 tons, while exports were only 99,691 tons. The growth in imports indicates that domestic ores are continually giving way to imported ores, for the reason that domestic ore contains less iron and requires therefore a greater quantity of coke, which is costly. A ton of pig iron produced from Slovak ore costs, according to the latest estimate, almost twice as much as does a ton of iron manufactured from Swedish ore.

Effects on German Industry of Decline in Exchange

Exchange Conditions Similar to Austrian and Russian Seem to Be Inevitable—British Coal Imported—Need for Capital—Pig Iron Again Advances

(*By Correspondence*)

BERLIN, GERMANY, July 17.—The Berlin printers have been on strike for a fortnight, but a settlement has at last been arrived at with the aid of the Government. The absence of reliable news has been felt keenly and the heavy fluctuations in exchange were no doubt accentuated by uncontrolled information and rumors. Paper money has not been printed during the strike, so that the wish of economists has been realized for a short time.

Dissatisfaction is evident in the mining industry. Members of the miners' union are threatening to strike unless the general agreement in the mining industry is altered. The difference over the question of working hours has been adjusted, but the wage increase has almost been surpassed again by the recent depreciation of the mark and the consequent rise in prices. The men ask for weekly payment of wages, instead of monthly, for alteration in the piecework system and in the position of their representatives (Betriebsräte) on the board of management. According to the latest reports, through the efforts of the Minister of Labor, a stoppage of work may be avoided.

Negotiations in Berlin on miners' wages have led to an increase of 70 marks per shift on the wages of June 1. The miners' union had originally asked for an increase of 35 marks on the June wages to counterbalance depreciation in the purchasing power of the mark, but it was realized that a substantial inducement was needed to keep the colliers from going into other industries paying higher wages. The socialist miners' union has advised its members to strike Aug. 1, to enforce a new agreement. This action of the union will add considerably to the uncertain position of trade and industry.

British Coal a Factor in Situation

British coal is appearing in the German market to such an extent that even the lignite producers are anxious about their trade, especially in the coastal districts. To increase the import of British coal to alleviate the scarcity in Germany, the Government allows the imported coal (except from Czecho-Slovakia and Polish Upper Silesia) to be sold without any rationing restrictions, and it is taxed only to the same extent as the home product.

Reparations coal is drawing heavily on the German production, and the Government has asked the Reparations Committee for permission to have British coal shipped to France instead of sending German coal. This is changing the reparation in goods into reparation in currency, to improve the coal situation, and will probably help in inflating the mark.

According to reliable reports coal imports were 1,200,000 tons in June, which is about 60 per cent more than in pre-war years. There has been a decline in orders for imported coal in the Rhenish-Westphalian district, but industry along the coast and shipping firms are ordering large quantities.

With the rise in coal, the prices for pig iron have gone up again. Pig iron prices, which had been fixed only on June 29, after lengthy negotiations with the representatives of labor, through a 476 m. increase in coke, have again been increased as follows per metric ton:

	Marks Amount of Increase	Marks Present Price
Hematite	595	8,265
Foundry iron No. 1	654	7,915
Foundry iron No. 3	554	7,845
Foundry iron, Luxemburg	642	7,073
Steel making, low in copper	595	7,845
Siegerland, steel making	595	7,845
Spiegeleisen, 8 to 10 per cent	690	8,929
Malleable pig iron	619	8,209
Ferromanganese 80 per cent	1,285	17,855
Ferrosilicon	1,070	10,120

German Industry in Need of Capital

German bankruptcies have continually decreased during the first half of 1922, and reached 88 in June, the lowest number in the past two years; 676 bankruptcies have been declared in the six months, against 1610 during the same period of 1921.

There is an unabated need for capital by industrial concerns, the capital of which amounted to 11,873,200,000 marks during the second quarter of 1922, compared with 4,196,000,000 marks during the same period of 1921. In June, 1922, increases in capital took place in 296 cases to the amount of 3,279,000,000 marks, equal to 73.5 per cent against 216 cases, with 1,540,000,000 or 88.5 per cent in June, 1921. New enterprises from April to June, 1922, were principally started in the following industries:

Machinery (59), commerce (59), metalworking (49), wood (42), chemicals (39), textile (38), food (32), coal and peat (11).

Prices are rising generally, the average wholesale index number of the Federal Statistical Office showing an increase from 6458 in May to 7030 in June. The index number for food increased from 5847 to 6405 and for metals from 6489 to 7029; for coal and iron from 7061 to 7469; and for industrial products together from 7602 to 8197. The exchange value of the mark decreased far more during this time, and it is interesting to recall that the dollar stood at 186 marks on Jan. 2 against 502 on July 7. The recent inflation of German currency is not yet noticeable in prices but they show a strong upward tendency.

During the Genoa conference German exchange was fairly stable and the rising prices threatened to restrict export. The crisis in German trade and industry, which had been predicted for months, seemed imminent. Manufacturers opened the question of reduction in wages and increase in working hours. There were even extensive strikes and lockouts in the South, causing enormous losses, and wage agreements were arrived at only after lengthy negotiations. The whole situation has now radically changed. The failure to stabilize the currency caused the mark to resume its downward movement, which lately has assumed such dimensions that conditions of exchange similar to those of Austria and Russia seem inevitable.

There is evidently no prospect now of a change in the German industrial position. With a few exceptions, German industries have orders for several months, and as buyers realize that prices will not come down, new orders are placed more frequently. There is, however, not so much speculative buying as on previous occasions when the mark dropped, as firms are selling only on a sliding price scale now and require a long time for delivery. Everybody with a stock of material is keeping it, for fear of losses through the depreciation of the currency. Some firms are sold up until 1923 and are declining further orders. Associations in cast iron, steel and hardware announce heavy increases in their prices. The number of unemployed is constantly diminishing. Berlin, for instance, had only 8442 on the lists at the end of May against 58,471 at the beginning of the year.

Imports are largely a question of delivery. With the declining German exchange home supplies are always cheaper than foreign material, but works are generally unable to meet the demand. To supply their customers manufacturers are paying a higher price for imports rather than be delayed in production through shortage of material.

According to a preliminary statement of the Government Statistical Office the imports in May amounted to 3,810,000 metric tons, valued at 32,400,000,000 marks, and exports to 2,090,000 tons, valued at 27,200,000,000 marks. The imports increased by 920,000 tons compared with April. Exports were, however, 82,700 tons less.

Depreciation of the mark has again relieved industry of anxiety as to the future, especially in export, but it is realized that this is only a temporary condition, and that provision must be made for the time when the mark becomes more stable. Some firms are even accepting export contracts with the stipulation that the customer be allowed to withdraw if German prices rise above the world's level. It is the constant complaint of German customers that goods needed in the domestic market are sold for export because of the higher prices obtainable. There is an undiminished home demand, but it is only when export is slackening that German manufacturers receive sufficient supplies. Should exports cease, the German market is capable of absorbing most of the industrial products for some time, and it is this fact that exporters reckon with at present.

It is also held in some quarters that demand from the Russian market may prevent serious shocks to German industries if endeavors to develop trade to that country meet with success. The Treaty of Rapollo seems to have stimulated considerably the opening up of trade relations between the two countries. New companies have been formed in Upper Silesia and in the Rhenish districts for trade with Russia and negotiations are being conducted in several industries to form syndicates for the same purpose.

Manufacturers Import Despite High Prices

The catastrophal fall in the mark recently has led to a temporary decline in German orders for iron and steel in the Saar district. Rumors of a moratorium have again stimulated buying, but business is done on only a small scale. The present value of the mark offers no inducement to the German importer but the latest increases in domestic prices of iron and steel reduce again the margin between the German and the imported product. Hence manufacturers are willing to pay a higher price rather than be delayed in production for want of material. The higher prices of imported material are moreover counterbalanced by the prices being fixed while German firms are selling "freibleibend" (prices subject to change), and by the certainty of prompt delivery. The question of delivery within the specified time has not been treated with proper consideration by German manufacturers, and export orders are being canceled because of delayed delivery. Irregular supplies of fuel and raw materials are generally the cause. The question is, however, frequently discussed, as the German export trade is losing its reputation through the carelessness of some manufacturers in supplying their foreign customers.

In the south of Germany, Saar, Luxemburg and Lorraine iron and steel products still predominate, as it is impossible to procure sufficient home material. The demand in semi-finished material, especially in bar iron, is brisk, as the machinery industry is again in the market. As imports must be paid for in francs, the trade depends on the rate of exchange and business is largely a matter of speculation in foreign bills. The following quotations in marks per metric ton for "Right" and "Left" Rhenish material show the considerable difference between domestic and imported products.

	Left Rhenish (Saar, Luxemburg, Lorraine)	Right Rhenish (German)
Bar iron	21,700 to 23,900	15,590 to 17,800
Structural shapes	20,600 to 22,800	15,370 to 17,580
Hoop iron	23,980 to 26,190	17,480 to 19,690
Universal iron	22,900 to 25,200	16,800 to 19,100
Sheet, heavy	6,500 to 11,300 marks higher	17,350 to 19,480
Sheet, medium		19,220 to 21,400
Sheet, light		20,560 to 22,740

A meeting of the representatives of manufacturing and wholesale firms has been held in Düsseldorf to discuss arrangements for the importation of ferrosilicon. It was agreed that the home product should receive some protection but, because of the absence of representatives of consumers, the meeting was postponed until September. In the meantime import permission will be given if proof can be furnished that the home production is insufficient to meet the demand. In all other cases permits shall be issued only if the imported material is 5 per cent cheaper than the German product.

Some American companies, well known over here in the machine tool line, were again in the market lately and in strong competition with German makes. The German machine tool industry made great progress during the war, but some American specialties are still in favor, and will find a good market if the price is not prohibitive. The exchange rate is at present a deterrent.

New manganese ore deposits have been found in Ungaria in the Vesprimer Komitat. A new company, in which the German Bank is largely interested, has been founded with a capital of 120,000,000 kronen to exploit the deposits.

Revolution or Stroke Counter

A Universal model counter, which, among other uses, is adaptable to punch presses, stamping presses and coal conveyors, is being marketed by the Precision Machine Co., Milwaukee. The device is shown in the accompanying illustration and can be used either as a revolution or a stroke counter.

In this design all wheels are locked when not counting, and all are interchangeable. No lead gear or lock washers are used, also no ratchets, ratchet pawls or springs. Gears are of steel and important parts are hardened. Transparent fireproof material is used in place of glass to cover the numbers and readings are legible at a distance of twelve feet. The counter is unusually light in weight and has an unlimited amount of overstroke which provision eliminates the necessity of particular care in setting the connection rod.

Revolution or Stroke Counter for Use on Punch and Other Presses

It is claimed that the device will operate as satisfactorily at 1000 r.p.m. as at any slower speed, a test of a counter at that speed for six weeks and running more than 300,000 trips a day being said to show no appreciable wear. Electrical contacts permitting the location of the counter in the office or elsewhere at a distance, a method particularly applicable to coal conveyors, can be provided.

FABRICATED STEEL BUSINESS

Bridge and Building Awards and Tonnages Pending at Leading Centers

Awards for fabricated steel work for the past week include the following:

New York County Court House, 9000 tons, to New York Shipbuilding Corporation, Camden, N. J.

Office building, Stapleton, Staten Island, New York, 400 tons, to Paterson Bridge Co.

Sterling Hall of Medicine, Yale University, New Haven, 700 tons, to Levering & Garrigues Co.

International House, Riverside Drive, New York, 1200 tons, to Taylor-Fichter Steel Construction Co., fabrication, it is thought, to be done by American Bridge Co.

Loft building, Brooklyn, 500 tons, to the Hay Foundry & Iron Works.

Hospital building, Elmira, N. Y., 300 tons, to the American Bridge Co.

Apartment house, New York, 1800 tons, to the American Bridge Co.

Tanks for the Sinclair Consolidated Oil Corporation, 7000 tons, to Riter-Conley Co.

Western Electric Co., Hawthorne, Ill., wire drawing plant, 1400 tons, to McClintic-Marshall Co.

Broadway Department Store, Los Angeles, Cal., 1100 tons, to Baker Iron Works.

J. B. Book junior office building, Detroit, 1100 tons, to Russell Wheel & Foundry Co.

Agricultural Building, University of Illinois, Urbana, 462 tons, to an unnamed fabricator.

Exchange National Bank Building, Pittsburgh, 275 tons, to Fort Pitt Bridge Works.

Hyde Park Y. M. C. A. Building, Chicago, 240 tons to Vierling Steel Works.

Chicago & Northwestern deck plate girder spans over Milwaukee River, near Lindwerm, Wis., 215 tons, to American Bridge Co.

Illinois Northern Utilities Co., power station, Dixon, Ill., 150 tons to Indiana Bridge Co.

State terminal pier, Portland, Me., 1000 tons, to McClintic-Marshall Co.

Structural Awards

Ideal Concrete Machinery Co., Cincinnati, 103 tons, to Dayton Structural Steel Co.

Addition to plant of Warner Elevator Co., Cincinnati, 220 tons, to Fort Pitt Bridge Co.

Warehouse for National Biscuit Co., Cincinnati, 100 tons, to General Iron Works Co.

Addition to plant of Littleford Brothers, Cincinnati, approximately 100 tons, to Fort Pitt Bridge Co.

Power house for Ottawa Silica Co., Ottawa, Ill., 100 tons, to Lakeside Bridge & Steel Co., Milwaukee.

Plant for Lafayette Motors Co., Indianapolis, at Milwaukee, 750 tons, to H. K. Ferguson Co.

Transmission towers, Appalachian Power Co., Coalwood, W. Va., 600 tons, to American Bridge Co.

Dam No. 44, Ohio River, 300 tons, to American Bridge Co.

Highway Bridge, Kent, Conn., 300 tons, to American Bridge Co.

Bridge No. 2 over Allegheny River, 300 tons, to American Bridge Co.

Michigan Lafayette Building, Detroit, 1700 tons, to McClintic-Marshall Co.

Structural Projects Pending

Inquiries for fabricated steel work which may be added to lists of pending projects include the following:

Federal Sugar Refining Co. building, Yonkers, N. Y., 200 tons.

Bridges for the New York Central Railroad, 400 tons.

Highway bridge for Paterson, N. J., 600 tons.

Oil tanks for the J. G. White Engineering Corporation, New York, 400 tons.

Highway bridge for Baltimore, 400 tons.

State Capitol Building, Lincoln, Neb., 2100 tons, Westover Steel & Iron Co., Paxton & Vierling Iron Works and Omaha Steel Works, low bidders, respectively, on three alternates.

American Can Co., new building, New Orleans, 185 tons.

Addition to Carter Building, Houston, Tex., 670 tons.

Pullman Co., Pullman, Ill., foundry building, 1000 tons, Frank D. Chase, Inc., engineer.

Open hearth furnaces, Otis Steel Co., 6000 to 6500 tons.

Forge building for the Frick Co., York, Pa., 450 tons.

Railroad Equipment Business

Orders for locomotives and new cars, particularly freight, continue to appear and large orders for the repair of old cars are still a feature. The number of locomotives and idle cars at the present time is not regarded as sufficient by some railroad executives and the possible settlement of the railroad and coal strikes is expected to increase the demand for both.

The largest single order for new locomotives placed last week was for the account of the New York Central Railroad. This was for 150 modern freight locomotives of the Mikado type, of which the American Locomotive Co. is expected to supply half and the Baldwin Locomotive Works half.

In addition to the orders placed many roads are in the market for new engines. The Union Pacific is inquiring for 55 Mountain type and 15 Santa Fe type locomotives, and the Chicago, Indianapolis & Louisville is in the market for five Mikado engines and two of the Pacific type. Bids for the repairing of 75 locomotives are in the market now.

The Norfolk & Southern Railroad to-day applied to the Interstate Commerce Commission for permission to issue first lien equipment notes to the value of $375,000 for the purpose of rebuilding 397 bad order cars, requiring the installation of steel underframes and center rails.

The Union Pacific Railroad is inquiring for 10 mallet type, 55 mountain type and 15 Santa Fé type locomotives.

The Nickel Plate Railroad has placed orders for 15 freight engines with the Lima Locomotive Co.

The Monon is inquiring for 2 Pacific and 5 Mikado type engines.

The Baltimore & Ohio Railroad wants 15 Pacific type engines in addition to the freight engines it recently ordered.

The Chicago, Rock Island & Pacific has placed orders for repairs on 500 wooden box, 500 furniture and 500 steel frame box cars with the Western Steel Car & Foundry Co.

The Missouri Pacific has let repairs on 1250 gondola cars to the American Car & Foundry Co., on 1000 to the Sheffield Car & Equipment Co. and on 250 to the Mount Vernon Car Mfg. Co.

The Burlington has let repairs on 500 general service cars to American Car & Foundry Co. and on a like number to the Keith Railway Equipment Co.

The Chesapeake & Ohio has let repairs on 1500 hopper cars to the American Car & Foundry Co. and is inquiring for 50 steel frame refrigerator cars.

The Seaboard Air Line has placed repairs on 400 cars with the Magor Car Co. and still has repairs on 1000 cars to place.

The Tennessee, Alabama & Georgia is inquiring for 20 box and 20 composite gondola cars.

The Northern Pacific has placed 70 passenger service refrigerator cars with American Car & Foundry Co.

The Pittsburgh & West Virginia Railroad has placed 9 coaches, 1 passenger and baggage, 2 passenger, mail and baggage, and 2 baggage cars with American Car & Foundry Co.

The Philadelphia & Reading has ordered 5 baggage and 5 baggage and mail cars from American Car & Foundry Co.

The Wilcox Co., Chicago, is inquiring for 50 hopper cars.

The San Antonio, Uvalde & Gulf Railroad is in the market for 25 ventilated box cars and 25 composite gondola cars.

The Winston-Salem Southbound Railroad is inquiring for 6 coaches and 3 baggage and mail cars.

The Baltimore & Ohio has placed 500 gondola repairs each with the Pullman Co. and Illinois Car & Mfg. Co.

The Lehigh & New England is inquiring for 150 ton gondola cars and the New York Central is reported to be in the market for 50 King-Lawson air-dump cars.

Working Out Coal Distribution Plans

Large Place of State Organizations—How an Industrial Consumer in Need Proceeds—Personnel of Committee in Charge

WASHINGTON, Aug. 1.—The President's committee in charge of fuel distribution is completing its organization and it was stated by officials that it probably would be in complete operation on Wednesday. The organization has headquarters in the American Railway Association building on Eighteenth Street, across from the Interstate Commerce Commission Building.

Regardless of how soon the labor situation is entirely ended, however, it was said yesterday by Secretary of Commerce Hoover that coal and car distribution will be necessary for an indefinite period, estimated at 30 to 60 days. The iron and steel industry, as is evidenced from reports coming to Washington, is watching developments closely, but is showing no signs of being unduly alarmed. The greater producing companies, it is declared, have considerable coal on hand and can go along with restricted output for some time before, as a whole, there is an acute pinch felt.

First priority orders, aside from those for fuel for railroads, will be for shipments to the Northwest and New England. The President's committee is already engaged in checking up coal supplies on hand, needs for preferred industries, and consumers, States, etc.

Some Requests for Modification of Orders

Before the fuel distribution administration had organized, representatives of some industries, claiming to be on the preferred list, began to make inquiries as to how to get coal. The tendency to resort to individual priority orders, however, has not been strong so far. While the fuel distribution (President's) committee and the central purchasing committees of the railroads were setting up their organizations, requests for modifications of the car service orders were coming to the Interstate Commerce Commission. Representations were made on behalf of users of open top equipment, moving such material as sand, gravel, brick, rough lumber and stone, for a change in the orders that would permit for their use flat or mixed bottom open tops cars with sides higher than 36 in. inside measurement. Changes in the immediate future, however, do not seem probable.

Embargoes against all freight but coal, live stock and fuel oil declared by the Chesapeake & Ohio and the Norfolk & Western were declared in order to hasten the movement of these commodities, which are on the preferred list, these lines being two of the chief arteries which serve operating mines at present.

Procedure in Securing Coal

Reduced to the simplest form, the working plan for distribution of coal and cars is as follows: The consumer, unable to get coal through his regular channels, applies to the State committee. The State committee distributes the quota that has been alloted, if any has been alloted. In the event the State has no coal, appeal is made to the presidential committee in Washington. This latter committee then will deal with the central committee of coal operators. The central committee in turn makes requisition on the district committees.

It is always to be kept in mind that the iron and steel, or any other industries, will get coal in their usual way, provided the coal is available and has not been allocated to consumers on the preferred and priority list included in the car service orders of the Interstate Commerce Commission, which has general supervision over the distribution of cars. Obviously, the iron and steel industry, being in the "other purposes," or lowest classification, will have to wait until the demands of those on the preferred list are filled. Where there is not a sufficient supply either of coal or of suitable open top equipment, 36 in. in height, the industry necessarily will have to suffer. Preference for the class equipment mentioned is to be supplied for consumers on the priority list, but it does not include flat bottom gondola cars with sides less than 36 in. in height, or cars equipped with racks, or cars which on July 1 had been definitely retired from service for the transportation of coal and stenciled or tagged for other service.

Likely Preferences in Steel Trade

The list of consumers and commodities included in the orders of the Interstate Commerce Commission manifestly is subject to revision or amplification, and because of this, it is conceivable that certain units of the iron and steel industry, as for instance tin plate, oil country goods, steel for building new and repairing old cars, etc., may be given preferred listing, though there has been nothing to indicate that this plan is in contemplation at present.

Secretary of Commerce Hoover, chairman, Secretary of the Interior Fall, Attorney General Daugherty, and Commissioner Aitchison of the Interstate Commerce Commission, constitute the Presidential Committee, which has general supervision of the measures for the distribution of coal and the restriction of unfair prices. Acting in this capacity, Mr. Hoover has selected C. E. Tuttle, of the Tuttle Coal Corporation, New York, as advisor on the Lake situation. Mr. Tuttle, whose experience has familiarized him with this situation, will advise as to the coal tonnage going to the Lakes and as to its distribution in the Northwest. It was stated by high Government officials that it is not believed there will be any interruption of the movement of iron ore traffic from the upper mines to Lake Superior ports because of the sufficiency and the type of equipment used in that service.

Control of distribution of available coal supplies on a priority basis to essential industries and utilities is, of course, under the direction of Henry B. Spencer, the administrative member of the President's Committee, formerly vice-president of the Southern Railway and general purchasing agent under the one-time Railroad Administration. Mr. Spencer assumed his duties in Washington last Saturday. The selection of Mr. Spencer as fuel distributor was followed by a statement at the White House expressing confidence that production of coal, regardless of rail and mine strikes, eventually would be adequate to meet requirements. While the statement by some was thought to be somewhat over-optimistic, it did provide a cheering tone for the iron and steel and other industries, whose output had been restricted owing to fuel shortage, because it was associated with plans to bring the rail strike to a quick end and with the hope that the coal strike also will not be of much longer duration.

In view of other futile attempts to end the strike, the public is apparently in a waiting mood to see what actually materializes before becoming over-confident as to results. The plan of the Federal Government to put upon each State the entire responsibility for the distribution of coal within its own borders, together with other parts of its program, was accepted as recognition of the necessity to omit no details for a rigid control, such as might be necessary if the coal and rail strikes are not settled in the near future.

Secretary Hoover has been given assurances from practically all those coal producing States to which he has appealed that they will, as was suggested, take all responsibility for the distribution of coal within the borders of their respective commonwealths and do all

they can to end profiteering. It is the purpose of the Presidential Committee to see that the States get coal from operators at a fair price and that each State gets its quota.

Coal Exports Practically Prohibited

As a means of further conserving the available coal supply, Mr. Hoover notified the coal bunkering trade to bunker ships only to the nearest port of call. No exports of coal are to be permitted although urgent requirements in the West Indies will be given consideration. Foreign ships also have been notified to bunker at their own ports for complete trips and Canada has been advised not to rely on the United States for its entire supply of coal, but to import as much fuel as possible.

Under the plan set up by the Presidential coal distribution committee, distribution for railroad use will be directed from Washington, but with the possible exception of a few interstate public utilities, the responsibility for all other distribution will rest upon organizations created under State control.

SITUATION IN PITTSBURGH

Views Toward Strike Ending Proposals—Stocks, Prices and Production Rates

PITTSBURGH, Aug. 1.—Suggestions from Washington and elsewhere that this week would bring a conclusion of the twin strikes—coal and railroad—are received here with considerable skepticism. While everyone hopes for the best, most are prepared for the worst. A meeting of 148 railroad officials is considered to be less likely to "get anywhere" than a smaller group, because there will be so many to be heard and also because there is certain to be a sharp division of opinion on the main question at issue, that of restoring old seniority ratings to the strikers. No doubt, many railroad officials will be willing to concede this demand of the men for the sake of peace, but there is a feeling among traffic men here that such a move will find much opposition, if for no other reason that any such discipline as the railroads have been able to establish since the railroads reverted from Governmental to private management would be destroyed. To allow the men, who in spite of warnings that they would lose their ratings if they went out and who were given plenty of opportunity to hold them after having gone out, to go back now at the same places in the seniority lists, it is argued, would be tantamount to a declaration by the officials that the men could strike any time and not suffer in their positions as to promotion and pension privileges. The suggestion that an appeal will be made to the President for a month's period of grace in which to meet strike conditions strengthens the idea that getting the officials into line is not going to be an easy matter. That the railroads are suffering from the strike is too evident to be denied, but it also is a fact that the places of the strikers have been filled to a larger extent than is comfortable to the men who have gone out.

With regard to the coal strike, there is a very strong sentiment among operators here to "fight it out" and little disposition among owners of union mines to abandon their original position of being willing to make an agreement with the men of this district. The "four State" agreement finds no supporters here and the number of operators now taking a stand on the side of the open shop idea is greater than when the strike began. Assured of ample protection, by the State and Federal authorities, there is a strong movement on foot to open the mines without recourse to agreements of any sort. In this connection, the aggressive stand of the Pittsburgh Coal Co., which is the largest single producing unit in the district and which during the first three months of the suspension was inclined to pursue a passive policy, is commented upon. This company has succeeded in starting up some of its idle mines in Washington County and is now least disposed of all producing units to enter a conference with the union leaders.

In the non-union Connellsville district, where so many mines are owned by the steel companies, no consideration at all has been given the idea of a conference. The steel companies' mines are not commercial ventures; their output goes directly to the plants of the owners and since steel plant operation is on an all-the-year-round basis, miners there have more constant work than those employed in strictly commercial mines. It may be that operators in some other districts may get together with the union officials and frame an agreement, but it may be set down that the present attitude of most Pittsburgh district operators is in opposition to other than a district agreement and also to a continuance of the check-off system, which made the operators collectors of union dues and assessments.

Low Coal Stocks

There has been very little change in the strike situation in the week in this district. The gain in production has been very slight. There does not seem to have been any easing in the railroad congestion and deliveries of Southern coal still are much restricted. The reserve stocks of the steel companies are getting dangerously low and some see a complete or nearly complete suspension before there can be any relief. If the railroad and coal strikes were to end immediately, there is doubt that the prospect would be much helped, since the operation of the priority system would mean the movement of coal to those consumers having preference over the iron and steel industry.

It is the interpretation of Secretary Hoover's plan that the steel companies owning mines would not be able to control their own coal, save those who have their own rail lines for hauling it or who can ship by water. The latter is one avenue that is open to the Pittsburgh steel mills not open to other districts. River traffic is outside the scope of the Interstate Commerce Commission and if the river mines can be operated, Pittsburgh would be able to get coal and the mills could be kept going.

Easier Coal Prices, but Higher Coke

Coal prices have eased off a little since a week ago, due to buyers withdrawing from the market in the belief that denial of cars to those seeking exorbitant prices will have a salutary effect. Some operators are falling in line with the price ideas of Secretary Hoover, but there are quite as many who went through with the Government's "fair prices" plan two years ago, who saw others reap a golden harvest and who now are inclined to ask "all the traffic will bear" in the idea that no harm can come to them. Coke still is very hard to obtain and as costly, if not more costly, than a week ago. Recent sales generally have been around $15 per net ton at oven for bee hive oven foundry coke, but there have been instances where more, even up to $17.50 has been paid. Coke is coke these days and the price is the same whether it is for furnace of foundry use.

Operations in the Pittsburgh district plants are holding up fairly well, but a decline is immediately ahead, owing to the light reserves and the difficulty in getting new supplies of coal.

Waiting Developments at Uniontown

UNIONTOWN, PA., July 29.—Independent coal and coke operators of the Connellsville bituminous region, while feeling that tentative prices of coal at $3.50 under Federal regulation, are rather low with present production costs, are going along with the Government plan of distribution and priority. Out of the present strike emergency, it is believed, will grow a permanent

association of operators in Fayette and Greene counties. The skeleton of this association already has been formed with some 50 operators as members.

Widespread comment developed in the region this week with the publication of a statement from Washington that the Department of Justice had promised complete investigation into the alleged activities of foreign societies and lodges in the region in intimidating workers, preparing letters and directing a campaign to keep miners away from the jobs.

George Whyel, president of the new operators' association, stated that the average production in the region would be around 20 per cent at the present time. H. C. Frick Coke Co. production is around 35 per cent this week. Little actual change has been noted. The possibility of a settlement of the bituminous strike has had the effect of keeping many men away from work who otherwise would have returned.

Railroad Executives Reject the President's Proposal for Seniority Rights

Railroad executives in session at the Grand Central Terminal, New York, on Tuesday, Aug. 1, rejected the proposal of President Harding that striking shopmen be reinstated without forfeiting seniority rights, but accepted conditionally the other two suggestions of the President for the settlement of the strike. The meeting was attended by the executives of 148 of the principal railroads of the country. President Harding's proposals were as follows:

"1. Railroad managers and workers are to agree to recognize the validity of all decisions of the Railroad Labor Board and to faithfully carry out such decisions as contemplated by laws.

"2. The carriers will withdraw all lawsuits growing out of the strike, and Railroad Labor Board decisions which have been involved in the strike may be taken in exercise of recognized rights by either party to the labor board for rehearing.

"3. All employees now on strike to be returned to work and to their former positions, with seniority and other rights unimpaired. The representatives of carriers and representatives of organizations especially agree that there will be no discrimination by either party against employees who did or did not strike."

The action of the executives was telegraphed to the White House late Tuesday afternoon, as soon as it had been drawn up by a sub-committee headed by Judge Robert S. Lovett of the Union Pacific and approved unanimously by the general conference.

CHICAGO, Aug. 1.—Executives of the six federated railroad shop crafts went into conference today to consider President Harding's proposal for a settlement of their strike. It was stated that the discussion probably would be finished by noon of Wednesday. One proposition to come before the meeting is that the striking shop crafts settle their strike with such roads as are willing to agree to the President's proposals, regardless of whether all the roads agree to them.

Indianapolis Chamber of Commerce Champions Open Shop

In response to a resolution setting forth that the effect of the demands of the striking coal miners and railroad workers means that the non-union shopmen who have taken the places of the strikers would be deprived of their positions to make room for the striking craftsmen; also that loyal employees remaining in the service of the companies and who would have greater seniority rights than returning strikers, would be displaced to make room for the strikers, tending to force all non-union shopmen to become members of the union, bringing about the closed shop on the railroads, the board of directors of the Indianapolis Chamber of Commerce adopted a resolution July 21 in favor of the open shop.

The resolution urges that "this un-American attempt at compulsory unionism be relinquished and that all men shall have the lawful sanction of the government to the exercise and enjoyment of their legal right to pursue a lawful vocation without interference or molestation."

Protest against any settlement of either the coal or railroad strikes which carries with it the discharge of any loyal non-union worker, is voiced.

Protest is also expressed against reference to loyal railway employees as "strike breakers," inasmuch as the Railroad Labor Board has publicly announced that new employees and old employees who refused to strike "are not strike breakers seeking to oppose the arbitrary will of an employer on employees. They have the moral as well as the legal right to engage in such service of the American public and to avoid the interruption of indispensable railway transportation and are entitled to the protection of every department and branch of the government, state and nation.

1920 Wages in Kentucky-Tennessee District

The joint arbitration board of the Kentucky-Tennessee district, in session at Cincinnati, July 28, decided to restore the wage scale of 1920 to union coal miners in the section around Pineville, Ky., to a few mines in the section around Nashville, Tenn., and to mines along the line of the Tennessee Central Railroad. The award grants an increase of wages amounting to 24c. a ton to pick and machine miners; 20 per cent increase on yardage and dead work, and $2.50 a day to datal and monthly men. The award is not a recognition of the union, but is simply a resumption of the 1920 wage scale with the miners as individuals.

State Fuel Distributers

WASHINGTON, Aug. 1.—Federal Coal Distributer H. B. Spencer this afternoon was advised of the appointment of the following State fuel agencies:

Alabama, Hon. Roy R. Cox, fuel administrator, Montgomery.

Connecticut, Public Utilities Commission, Hartford.

Florida, Florida Railroad Commission, Tallahassee.

Illinois, Robert M. Medil, distributer, Department of Mines Shipping Field.

Indiana, Indiana Public Service Commission.

Iowa, Charles Webster, fuel administrator, Des Moines.

Kansas, Committee of Industrial Relations, Topeka.

Kentucky, J. Sherman Cooper, chairman Railway Commission, Frankfort.

Massachusetts, Fuel Adminstrator, Boston.

Michigan, State Administrator Board, Lansing.

Nebraska, State Railway Comission, Lincoln.

New York, committee composed of representatives of the port authority, the Public Service Commission, the Transit Commission and the Attorney General.

North Carolina, State Corporation Commission, Raleigh.

North Dakota, Railroad Commission, Bismarck.

Pennsylvania, Public Service Commission.

Rhode Island, George H. Webb, Fuel Administrator, Providence.

South Carolina, Hon. B. E. Gerr, chairman Governor's Coal Committee, Greenville.

Tennessee, State Commission, composed of W. N. Beasley, representative of Public Utilities Commission, Wilbur A. Nelson, State Geologist, T. F. Peck, Agricultural Department and C. P. Pile, Bureau of Mines and Mining.

Vermont, J. M. Jones, State House, Montpelier.

Virginia, Maj. Alexander Forward, Coal Administrator, Richmond.

West Virginia, J. Walter Barnes, Fuel Commissioner, Charlestown.

Wisconsin, Edward Norman, Commissioner of Markets, Chairman; L. S. Gettle, Chairman of Railroad Commission, John G. Mack, State Chief Engineer, J. B. Borden, Secretary Board of Public Affairs.

JULY PIG IRON OUTPUT

Loss in July 1281 Tons Per Day as Compared with June

Twenty-six Furnaces Blown Out or Banked, Five Blown In

The immediate effect of the railroad strike in conjunction with the coal strike on the country's pig-iron output has been a large reduction in the number of blast furnaces in active operation. There were 26 furnaces blown out or banked in July and 5 blown in, resulting in a net loss of 21, or the largest since late in the depression a year ago. The July output, however, was larger than that for June and closely approaches the output for January, 1921, which was the largest in the last 17 months. The actual loss in daily output in July from that in June was 1281 tons per day.

The production of coke and anthracite pig iron for the 31 days in July, from data collected almost entirely by telegraph, amounted to 2,400,045 gross tons, or 77,421 tons per day, as compared with 2,361,028 tons, or 78,701 tons per day in June, a 30-day month. The increase in the July total output over June was 39,017 tons, contrasting with a loss in daily rate of 1281 tons. Last year the July output was only 864,555 tons.

The total number of furnaces in blast on Aug. 1 was 171, as compared with 192 on July 1, with 175 on June 1, with 162 on May 1 and with only 69 on Aug. 1, 1921, the low point in last year's depression. The capacity of the 171 furnaces in blast on Aug. 1 is roughly estimated at 71,500 tons per day, but the usual table of capacity in detail must be postponed to a later issue. On July 1 the 192 furnaces in blast had an estimated capacity of 81,845 tons per day. In July there were 26 furnaces blown out or banked and 5 blown in, a net loss of 21 furnaces. In June there was a net gain of 17 furnaces, so that the effect of the combined strikes has been to cancel the gain registered in June.

The manganese-alloy output made a new record on this movement in July, with a total production of 26,059 tons, or the largest since March, 1921. Of this total, 18,881 tons was ferromanganese and 7178 tons was spiegeleisen.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from July, 1921, is as follows:

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works	Merchant	Total
July, 1921	23,086	4,803	27,889
August	26,037	4,743	30,780
September	27,189	5,661	32,850
October	33,365	6,850	40,215
November	37,960	9,223	47,183
December	41,173	12,023	53,196
January, 1922	42,130	10,933	53,063
February	46,827	11,387	58,214
March	53,547	12,128	65,675
April	56,930	12,140	69,070
May	60,619	13,790	74,409
June	62,534	16,167	78,701
July	62,321	15,100	77,421

The figures for daily average production, beginning with January, 1916, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1916—Gross Tons

	1916	1917	1918	1919	1920	1921	1922
Jan.	102,746	101,643	77,799	106,525	97,264	77,945	53,063
Feb.	106,456	94,473	82,835	105,006	102,720	69,187	58,214
Mar.	107,667	104,882	103,648	99,685	108,900	51,468	65,675
Apr.	107,592	111,165	109,607	82,607	91,327	39,768	69,070
May	108,422	110,238	111,175	68,002	96,312	39,394	74,409
June	107,053	109,002	110,793	70,495	101,451	35,494	78,701
July	104,017	107,820	110,354	78,340	98,931	27,889	77,421
Aug.	103,346	104,772	109,341	88,496	101,529	30,780	.....
Sept.	106,745	104,465	113,942	82,932	104,310	32,850	.....
Oct.	113,189	106,550	112,482	60,115	106,212	40,215	.....
Nov.	110,394	106,859	111,802	79,745	97,830	47,183	.....
Dec.	102,537	92,997	110,762	84,944	87,222	53,196	.....

Diagram of Pig Iron Production and Prices

The fluctuations in pig iron production from 1913 to the present time are shown in the accompanying chart. The figures represented by the heavy lines are those of daily average production by months of coke and anthracite iron. The dotted curve on the chart represents monthly average prices of Southern No. 2 foundry pig iron at Cincinnati, local No. 2 foundry iron at furnaces in Chicago, and No. 2X at Philadelphia. They are based on the weekly quotations of THE IRON AGE.

Production of Coke and Anthracite Pig Iron in the United States by Months, Beginning Jan. 1, 1918—Gross Tons

	1918	1919	1920	1921	1922
Jan.	2,411,768	3,302,260	3,015,181	2,416,292	1,644,951
Feb.	2,319,299	2,940,168	2,978,879	1,937,257	1,629,991
Mar.	3,213,091	3,090,243	3,375,907	1,595,522	2,035,920
Apr.	3,288,211	2,478,218	2,739,797	1,193,041	2,072,114
May	3,446,412	2,108,056	2,985,682	1,221,221	2,306,679
June	3,323,791	2,114,863	3,043,540	1,064,833	2,361,028
½ year.	18,002,572	16,033,808	18,138,986	9,428,166	12,050,683
July	3,420,988	2,428,541	3,067,043	864,555	2,400,045
Aug.	3,389,585	2,743,388	3,147,402	954,193	.....
Sept.	3,418,270	2,487,965	3,129,323	985,529	.....
Oct.	3,486,941	1,863,558	3,292,597	1,246,676	.....
Nov.	3,354,074	2,392,350	2,934,908	1,415,481	.....
Dec.	3,433,617	2,633,268	2,703,855	1,649,086	.....
Ttl. yr.	*38,506,047	30,582,878	36,414,114	16,543,686	.....

*These totals do not include charcoal pig iron. The 1921 production of this iron was 94,730 tons.

Production of Steel Companies—Gross Tons

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies, as well as from merchant furnaces producing ferromanganese and spiegeleisen, show the following totals of steel making iron, month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons

	Total Production			Spiegeleisen and Ferromanganese		
	1920	1921	1922	1920	1921	1922
Jan.	2,232,455	1,932,159	1,306,045	23,957	22,228	6,874
Feb.	2,181,679	1,625,695	1,311,170	28,038	29,013	8,540
Mar.	2,480,668	1,323,443	1,629,982	35,275	41,294	13,695
Apr.	1,963,542	1,015,621	1,707,902	27,628	24,310	19,209
May	2,128,720	1,024,678	1,879,180	33,407	9,232	20,334
June	2,209,770	883,312	1,876,033	34,751	4,536	23,090
July	2,230,567	715,664	1,931,957	36,789	5,524	26,059
Aug.	2,254,943	807,144	.....	36,985	3,878	.....
Sept.	2,247,250	815,692	.....	39,546	3,289	.....
Oct.	2,393,644	1,034,312	.....	34,786	3,902	.....
Nov.	2,150,075	1,138,789	.....	26,944	3,525	.....
Dec.	2,047,167	1,276,381	.....	28,023	3,953	.....

Output by Districts

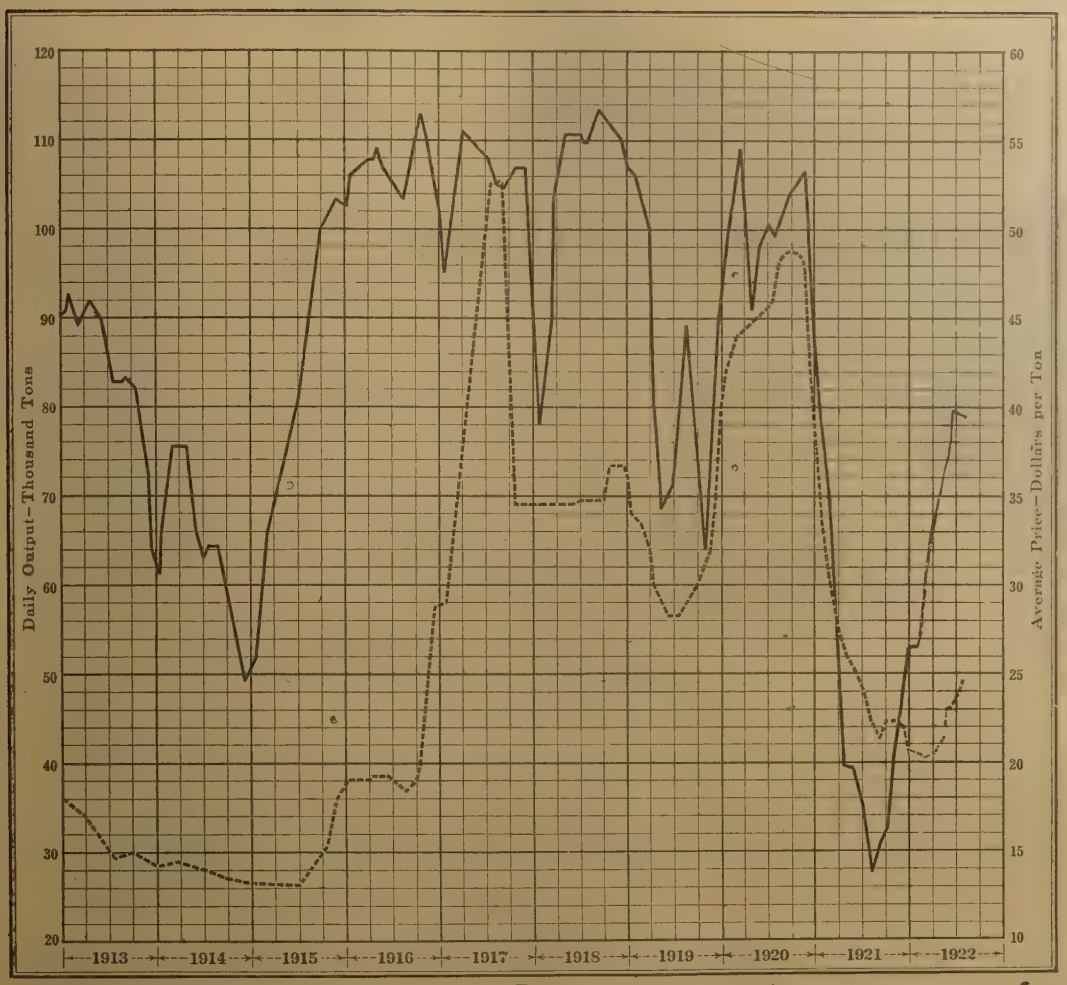
The accompanying table gives the production of all coke and anthracite furnaces for July and the three months preceding:

Pig Iron Production by Districts, Gross Tons

	July (31 days)	June (30 days)	May (31 days)	April (30 days)
New York	145,831	148,115	150,141	131,093
New Jersey	10,745	10,725	5,636	4,815
Lehigh Valley	58,070	66,967	66,572	45,714
Schuylkill Valley	54,660	60,925	66,669	58,927
Lower Susquehanna and Lebanon Valleys	26,689	26,501	21,313	17,387
Pittsburgh district	493,963	485,401	479,106	473,584
Shenango Valley	99,335	87,156	79,145	63,940
Western Penna.	82,294	91,494	103,072	106,430
Maryland, Virginia and Kentucky	55,984	54,687	47,862	26,463
Wheeling district	65,735	74,710	66,148	54,450
Mahoning Valley	233,093	240,470	227,053	197,113
Central and Northern Ohio	261,941	236,374	218,547	197,595
Southern Ohio	29,517	30,272	29,311	27,165
Illinois and Indiana	472,179	454,937	459,631	427,427
Mich., Minn., Mo., Wis. and Colo.	101,616	93,723	89,147	67,360
Alabama	195,910	189,101	196,104	171,823
Tennessee	12,483	9,470	1,222	828
Total	2,400,045	2,361,028	2,306,679	2,072,114

Among the furnaces blown in during July were the following: No. 1 Swede furnace in the Schuylkill Valley; No. 1 Ashland furnace in Kentucky; Nos. 1 and 4 Bessemer furnaces of the Tennessee Coal, Iron & Railroad Co. in Alabama and the Rockdale furnace in Tennessee.

Among the furnaces blown out or banked during July were the following: One furnace of the Lacka-



The Full Line Represents the Daily Production of Pig Iron and the Dotted Line Is the Average of the Price Per Ton of No. 2 Southern Pig Iron at Cincinnati, Local No. 2 Iron at Chicago and No. 2X Iron at Philadelphia

wanna Steel Co. and one furnace of the Donner Steel Co. in the Buffalo district; two furnaces of the Bethlehem Steel Co. in the Lehigh Valley; one Warwick and one Worth furnace in the Schuylkill Valley; one furnace of the Bethlehem Steel Co. at Steelton in the lower Susquehanna Valley; one Isabella and one Lucy furnace of the Carnegie Steel Co. in the Pittsburgh district; one Shenango furnace in the Shenango Valley; one furnace of the Bethlehem Steel Co. in Maryland; one La Belle furnace in the Wheeling district; one Ohio furnace of the Carnegie Steel Co., the Todd and Jeanette furnaces of the Brier Hill Steel Co., Nos. 2 and 4 Haselton furnaces of the Republic Iron & Steel Co., one furnace of the Youngstown Sheet & Tube Co. and the Trumbull-Cliffs furnace in the Mahoning Valley; one River furnace in northern Ohio; the Belfont and Milton furnaces in southern Ohio; Nos. 3 and 6 South Chicago (new) furnaces of the Illinois Steel Co. and Nos. 1 and 2 Gary furnaces in the Chicago district.

Blast Furnace Notes

The Temple furnace, Temple, Pa., idle since November, 1920, has been under repair recently and is ready to be put in operation in the near future. J. J. Becker is superintendent.

Norton furnace at Ashland is expected to go out any minute. The American Rolling Mill furnace at Ashland is still operating, and will likely be able to continue for at least a week. It looks now as though the Whitaker-Glessner at Portsmouth and the Columbus furnace of the American Rolling Mill Co. will be the only ones in blast at the end of another week.

Negotiations Proceeding Over Scrap Supplies in South America

The recently reported purchase of a large tonnage of iron and steel scrap located at various points on the west coast of South America, with which purchase Hyman Ehrlich, 233 Broadway, New York, is identified, is said to amount to as much as 260,000 tons. The Hyman Michaels Co., Chicago, is understood to be interested in the negotiations to an amount of 65,000 tons. So far it is stated that about 61,000 tons has been contracted for, 25,000 tons of heavy melting steel for the Bethlehem Steel Co. at Sparrows Point, Md., and 2500 tons of old iron rails to the same company for delivery to Lebanon. An additional tonnage of the rails is under option with Bethlehem, according to Mr. Ehrlich. The material includes also about 35,000 tons of cast iron car wheels, 21,000 tons of axles, and about 90,000 tons of unspecified material.

The Nautical Instrument Mfg. Co., Inc., 82 Beaver Street, New York, is in the market for molds and dies for making combination celluloid and metal instruments.

The Vitrified Wheel Co., Westfield, Mass., has returned to a 9-hr. day, as compared with an 8-hr. day heretofore.

The open hearth furnace development of the Otis Steel Co. at Cleveland provided one of the notable items in the fabricated steel market of the week.

Iron and Steel Markets

FURTHER CURTAILMENT

Fuel Situation Steadily Growing More Serious

Net Loss of 21 Blast Furnaces with Other Shutdowns Coming—Railroad Buying Still the Feature

The week has brought a further tightening of the grip of the coal and railroad strikes upon iron and steel works. It is realized that the situation will grow worse before it is better and that it has in it more serious possibilities than producers have yet entertained.

Pig iron production figures for July show how well the industry was maintaining itself, in spite of the railroad strike, until the priorities order became effective. After six months of steadily increasing output, July brought a net loss of 21 furnaces. However, the large majority of these blew out in the last week of the month.

In the 31 days of July production was 2,400,045 tons, or 77,421 tons per day, against 2,361,028 tons for the 30 days of June, or 78,701 tons per day. Merchant furnaces were hit hardest, their loss being nearly 1100 tons per day, while steel works furnaces held nearly up to the June rate.

The 171 furnaces in blast Aug. 1 had a capacity of about 68,000 tons per day, as against 81,845 tons per day for 192 furnaces on July 1. Since July ended other furnaces have been compelled to bank and with still others the uncertainties of getting coke are likely soon to be the certainty of not getting it.

This week the Steel Corporation has ordered the banking of two Carrie furnaces in the Pittsburgh district and of one Gary and one Joliet furnace in the Chicago district. In the Pittsburgh and adjoining districts nine furnaces have been thrown idle in the past week.

Steel works operations, owing to the large use of scrap, have not suffered in proportion to the falling off in pig iron. The Steel Corporation entered this week with steel output at nearly 70 per cent, but this is not likely to be maintained—and the average for independent steel companies has been nearer 60. Further reductions are impending in the Youngstown district.

In view of the enforcement of priority orders on coal shipments, a number of steel companies having stocks on hand are conserving their supply by slowing down steel works operation. A slight increase in Connellsville coke production is reported and some improvement in shipments of Kentucky and West Virginia coal.

Throughout the trade the view prevails that even with an early settlement of the two strikes, steel producers will not be greatly helped. Railroads and public utilities will be served first. Thus far few coal producers have regarded an order from the Pennsylvania Railroad calling for 20 per cent of their production.

The control of coal shipments has not gone yet to the point of holding prices in bounds. Some steel companies have paid as high as $10 for producer gas coal. Connellsville foundry coke has sold up to $17 and in most districts blast furnace coke is unobtainable at any price.

Already a good many consumers are taking less steel because fuel scarcity has cut down their operations, but others who have fuel are offering premiums for steel. Thus on a small scale the situation of the first half of 1920 is repeated and there is evidence of duplicate ordering to insure getting material. Prices in some cases have gone to 2c., Pittsburgh, and higher for bars and plates.

Railroad buying is still the strong feature of the situation. Several thousand additional cars are added to the list of repair orders. In locomotives the New York Central contract for 150 is conspicuous.

The persistence of structural business is another factor, and there is surprise at the continued buying in other lines, including automobile manufacture in spite of the accumulating difficulties in all industries.

The Pennsylvania Railroad has bought about 5000 tons more of steel, principally plates, for car repair work, making 17,000 tons it has taken for this purpose in two or three weeks.

In export trade several rail inquiries are up, including 8000 tons for Bolivia, 10,000 tons for Siam and 3000 tons for the Cuba Cane Co. London reports a 7000-ton rail order taken by the United States in competition with British makers.

Pig iron markets show further advances in prices, with only moderate inquiry, producers having little iron to offer in view of the curtailment of coke supply. At Chicago foundry and malleable irons are $1 higher and Lake Superior charcoal iron has advanced $1.50 per ton. In the Central West the advance on foundry iron is in some cases $2 per ton in the week. Foreign irons are still coming in at Atlantic ports to help out the Eastern market. Probably 30,000 to 35,000 tons has been sold here or sent over since the movement began in May.

In spite of the difficulty in getting coal, lake vessel owners expect to move all the Lake Superior ore the furnaces can take this month.

Pittsburgh

Sharp Curtailment of Operations with Mounting Prices on Little Buying

PITTSBURGH, Aug. 1.—The iron and steel industry still is paying a heavy toll to the coal and railroad strikes. In the past week no less than six blast furnaces have been forced into idleness by the shortage of fuel in this and adjacent districts. Late last week the Brier Hill Steel Co. put down one stack, while yesterday the Carnegie Steel Co. blew out one Lucy furnace and the Jones & Laughlin Steel Co. had to stop the operation of one Eliza furnace as well as one battery of its by-product plant at its south side works. The Youngstown Sheet & Tube Co. last Saturday put off a furnace and at Johnstown, Pa., the Cambria Steel Co. now has only three active furnaces as compared with five recently.

In the Mahoning and Shenango Valleys only six furnaces now are making iron, and it is probable that

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Aug. 1, 1922	July 25, 1922	July 3, 1922	Aug. 2, 1921
No. 2X, Philadelphia‡	**$29.76**	$28.77	$27.64	$21.35
No. 2, Valley furnace†	**28.00**	25.00	24.00	19.50
No. 2, Southern, Cin'ti†	22.55	22.55	22.55	23.50
No. 2, Birmingham, Ala.†	18.50	18.50	18.50	19.00
No. 2, foundry, Chicago*	**26.00**	25.00	24.00	18.00
Basic, del'd, eastern Pa.	**27.25**	25.75	25.75	21.25
Basic, Valley furnace	**25.00**	24.00	25.00	18.00
Valley Bess., del. Pitts	26.76	26.76	26.76	21.96
Malleable, Chicago*	**26.00**	25.00	24.00	18.50
Malleable, Valley	27.00	27.00	24.50	20.00
Gray forge, Pittsburgh	**27.76**	26.26	25.26	21.46
L. S. charcoal, Chicago	**33.15**	31.65	31.65	35.00
Ferromanganese, seaboard	67.50	67.50	67.50	70.00

Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$40.00	$40.00	$40.00	$47.00
Bess. billets, Pittsburgh	35.00	35.00	35.00	30.00
O.-h. billets, Pittsburgh	35.00	35.00	35.00	30.00
O.-h. sheet bars, P'gh	35.00	35.00	35.00	32.00
Forging billets, base, P'gh.	40.00	40.00	40.00	35.00
O.-h. billets, Phila.	40.17	40.17	40.17	35.74
Wire rods, Pittsburgh	40.00	40.00	40.00	42.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	1.70	1.70	1.70	1.85
Light rails at mill	1.75	1.75	1.70	1.85

Finished Iron and Steel, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	**2.025**	1.925	1.925	2.10
Iron bars, Chicago	2.00	2.00	1.80	1.75
Steel bars, Pittsburgh	1.70	1.70	1.70	1.75
Steel bars, Chicago	1.75	1.75	1.75	2.13
Steel bars, New York	2.04	2.04	2.04	2.13
Tank plates, Pittsburgh	1.70	1.70	1.70	1.80
Tank plates, Chicago	1.75	1.75	1.75	2.18
Tank plates, New York	2.04	2.04	2.04	2.18
Beams, Pittsburgh	1.70	1.70	1.70	1.85
Beams, Chicago	1.75	1.75	1.75	2.23
Beams, New York	2.04	2.04	2.04	2.23
Steel hoops, Pittsburgh	2.50	2.50	2.50	2.40

Sheets, Nails and Wire, *Per Lb. to Large Buyers:*	Aug. 1, 1922 Cents	July 25, 1922 Cents	July 3, 1922 Cents	Aug. 2, 1921 Cents
Sheets, black, No. 28, P'gh	3.15	3.15	3.15	3.00
Sheets, galv, No. 28, P'gh	4.15	4.15	4.15	4.00
Sheets, blue an'l'd, 9 & 10	2.40	2.40	2.40	2.40
Wire nails, Pittsburgh	2.40	2.40	2.40	2.75
Plain wire, Pittsburgh	2.25	2.25	2.25	2.50
Barbed wire, galv., P'gh	3.05	3.05	3.05	3.40
Tin plate, 100-lb. box, P'gh	$4.75	$4.75	$4.75	$5.25

Old Material, Per Gross Ton:				
Carwheels, Chicago	$19.50	$19.50	$18.50	$12.50
Carwheels, Philadelphia	17.50	17.50	17.50	16.00
Heavy steel scrap, P'gh	*17.00*	17.25	17.50	12.00
Heavy steel scrap, Phila.	15.00	15.00	15.00	11.00
Heavy steel scrap, Chicago	15.50	15.50	15.00	10.00
No. 1 cast, Pittsburgh	19.00	19.00	19.00	16.00
No. 1 cast, Philadelphia	**18.00**	17.50	17.50	17.00
No. 1 cast, Ch'go (net ton)	17.00	17.00	17.00	11.50
No. 1 RR. wrot, Phila.	17.50	17.50	17.00	14.00
No. 1 RR. wrot, Ch'go (net)	**14.25**	14.00	13.50	9.25

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$14.00	$14.00	$8.50	$2.75
Foundry coke, prompt	**14.50**	14.00	9.00	3.75

Metals, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Lake copper, New York	**14.12½**	14.00	13.75	12.00
Electrolytic copper, N. Y.	13.75	13.75	13.50	11.75
Zinc, St. Louis	**6.25**	5.95	5.35	4.20
Zinc, New York	**6.60**	6.30	5.70	4.70
Lead, St. Louis	**5.47½**	5.40	5.55	4.20
Lead, New York	**5.80**	5.75	5.75	4.40
Tin (Straits), New York	**32.75**	32.12½	...	26.50
Antimony (Asiatic), N. Y.	5.25	5.25	5.00	4.60

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price, Aug. 1, 1922, Finished Steel, 2.169c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel

July 25, 1922,	2.169c.
July 3, 1922,	2.169c.
Aug. 2, 1921,	2.364c.
10-year pre-war average,	1.689c.

Composite Price, Aug. 1, 1922, Pig Iron, $24.38 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

July 25, 1922,	$24.05
July 3, 1922,	24.19
Aug. 2, 1921,	18.81
10-year pre-war average,	15.72

this number will be further reduced before the end of the week. Of the 140 furnaces located in the triangle formed by Johnstown, Wheeling and Warren (Ohio) only 62 now are active, a loss of 15 from the recent peak of the furnaces now active. It is believed that the Hanna stack at Dover, Ohio; that of the Sharon Steel Hoop Co., Lowellville, Ohio, and one of the three of the Youngstown Sheet & Tube Co. soon will suspend.

Steel plant operations also are on a lighter scale. The American Sheet & Tin Plate Co. is operating at about 60 per cent, taking in both sheet and tin plate mills, and while the Carnegie Steel Co. last week averaged about 75 per cent operations, the expectation is that this week's rate will be much lower. Shortage of coal also is affecting other Steel Corporation subsidiaries here. The Jones & Laughlin Steel Co. and the Pittsburgh Steel Co. are at about a 60 per cent operation and the Pittsburgh Crucible Steel Co. somewhat below 50 per cent.

Pittsburgh is not much encouraged that an early settlement of the railroad and coal strikes will help the steel industry materially, because of the preference which railroads and public utilities and domestic requirements will have over the steel industry for some time to come. Right in Pittsburgh those steel plants which draw coal supplies by river would be helped by a settlement of the coal strike, since river transportation is unaffected by the priority system.

There is much confusion on account of the application of coal priorities, particularly on intrastate shipments, because control is left with the State public service commissions, and coal producers believe that these commissions lack authority to direct railroad operations. Few of the coal producers are inclined to honor an order recently made by the Pennsylvania Railroad demanding 20 per cent of the production. They feel that the railroad has no authority to make such a demand, and while the Pennsylvania Railroad can confiscate the coal the producers are refraining from consigning it to that road.

With the slowing down in steel plant activities, there also has come a falling away in the demand for steel. Consumers evidently expect to be in no better shape than the producers with regard to fuel supplies. Further advances have taken place in pig iron prices,

notably in special analysis iron, due to the fact that while the demand is far from active, there are more buyers than sellers and more demand than supply. No. 2 foundry iron now does not seem to be available at less than $28, Valley furnace, as against $25 a week ago, and an advance of $1 per ton has been established in basic iron on one or two good-sized sales.

Coal is slightly easier under a smaller demand, but fancy prices continue to be paid for the limited tonnages of coke that are coming on the market. Old material is slow and prices show a softer tendency.

Pig Iron.—Founders and other users of special analysis iron appear to be suffering less from the fuel shortage than are the steel companies, and as there continues to be a good demand from those sources, and production and available supplies are very limited, prices still are mounting. All of the merchant Valley furnace interests are out of the market and the only iron of foundry grade now offered is from a Cleveland furnace, which is quoting $28, Valley furnace, for No. 2 grade. This interest has made sales during the week at $26 and $27 and claims to have obtained $28 within the last two days. The most recent sale of gray forge iron was at $26, Valley furnace basis, but it is doubtful if any of this grade now could be had for less than $27. Similarly malleable iron is quoted at $27, Valley furnace, that being the basis of the most recent business, but fresh inquiries might be hard to cover at less than $28. Two sales of basic, one of 2000 and another of 3000 tons, have been made at $25, Valley furnace, thus setting the market at that figure. There is doubt, however, that more of that grade can be had that low. The Monongahela Iron & Steel Co., Paden City, W. Va., which is seeking a round tonnage of Bessemer iron for August, September and October delivery, has been quoted $26, Valley furnace, but claims ability to buy at $25. In the absence of sales this grade is quoted at the former price, $25. W. P. Snyder & Co. makes the average price of basic iron from Valley furnaces in July $24.56 and of Bessemer $25. June averages were $25 for both grades.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$25.00
Bessemer	25.00
Gray forge	$26.00 to 27.00
No. 2 foundry	28.00
No. 3 foundry	26.00 to 27.00
Malleable	27.00 to 28.00

Ferroalloys.—Business still is virtually at a standstill because of the uncertainty of continued steel plant operation, due to the fuel situation. Prices are unchanged. Practically no domestic ferromanganese is being offered at present and quotations are nominal. The British product, which is arriving in this country freely on orders placed 60 days ago, still is quotable at $67.50, c.i.f. Atlantic seaboard, for September delivery, but on spot tonnages the common quotation is $72.50. We note one inquiry for 100 tons of 20 per cent spiegeleisen for immediate delivery from a Pittsburgh district steel maker. This material still is quoted at $36 furnace for 20 per cent and $35 furnace for 16 to 19 per cent by the leading commercial producer, but this interest is committed on probable production over the remainder of the year.

We quote 78 to 82 per cent ferromanganese, $67.50 c.i.f. Atlantic seaboard for domestic; British, spot, $72.50; British, future, $67.50; German, 76 to 80 per cent, $66. Average 20 per cent spiegeleisen, $36 furnace; 16 to 19 per cent, $35 furnace; 50 per cent ferrosilicon, domestic, $55 to $60 furnace, freight allowed. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, $41.50; 11 per cent, $44.80; 12 per cent, $48.10; 13 per cent, $52.10; 14 per cent, $55.10; silvery iron, 6 per cent, $30; 7 per cent, $31; 8 per cent, $32.50; 9 per cent, $34.50; 10 per cent, $36.50; 11 per cent, $39; 12 per cent, $40.50. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $4.06 per gross ton.

Iron and Steel Bars.—On account of the restrictions to steel production caused by the fuel situation, there is no easing in the bar supply situation and prices are very firm within the quoted range. The Jones & Laughlin Steel Co. still is taking some tonnage at 1.70c. base, Pittsburgh, and that is the price also of the Steel Corporation, but for indefinite delivery. Most of the other independent makers are out of the market. Iron bars are up $1 per ton to 2.25c., base, for refined bars in carload lots.

We quote steel bars rolled from billets at 1.70c. to 1.80c.; reinforcing bars, rolled from billets, 1.70c. to 1.80c. base; rail steel reinforcing bars, 1.60c. to 1.70c.; refined iron bars, 2.25c. in car loads, f.o.b. mill, Pittsburgh.

Wire Products.—Although the demand often before has been greater, all makers are falling behind in their deliveries, because of the restrictions to steel production caused by the fuel situation. The Steel Corporation is more heavily committed than are the independents and naturally it is making the poorest showing with regard to deliveries. Prices higher than those named by the leading interest do not find much basis in sales. The full range of prices is given on page 315.

Cold-Finished Steel Bars and Shafting.—The effort to establish a minimum of 2.25c. base, Pittsburgh, so far has not been successful, despite the increasing difficulties which makers are having in getting hot-rolled bars promptly, because demands are not sufficiently heavy or urgent. Consumers generally are disposed to wait on deliveries on contracts on which prices are much below even the present minimum of 2.10c. Ground shafting is firm and unchanged at 2.50c. base, mill, for carloads and 2.75c. for less than carloads.

Rivets.—The recent advance of $5 per ton has not in any way lessened the demand, which is still reported to be heavy, due to the fact that so much structural work is in progress, while railroad equipment manufacturers are extremely busy. The automotive industry as yet has shown no appreciable slowing up and this fact largely accounts for the continued heavy demand for small rivets. The new quotations are well observed on new business. They are to be found on page 315.

Billets, Sheet Bars and Slabs.—Since the finishing mills are suffering quite as much as the steel works from the coal shortage and the introduction of the priority system means that there can be no immediate improvement in the fuel supply situation, business in semi-finished steel has become exceedingly quiet in the past week. Buyers are not anxious for supplies and producers are not anxious for business. Prices are nominal, but $35 is regarded as a fair appraisal of today's value of sheet bars, slabs and large billets. Steel works operations are holding up better in Pittsburgh than in some of the nearby districts.

We quote 4 x 4-in. soft Bessemer and open-hearth billets at $35; 2 x 2-in. billets, $35; Bessemer and open-hearth sheet bars, $35; slabs, $35; forging billets, ordinary carbons, $40, all f.o.b. Youngstown or Pittsburgh mills.

Iron and Steel Pipe.—Demand for the smaller sizes of standard pipe finding their heaviest use in building construction still is on a tremendous scale and obligations of most producers are so heavy that they are obliged to restrict new bookings. Some have adopted the plan of taking on new business to the extent only of what can be supplied from stock or fitted in with existing mill schedules. Butt weld capacity is estimated to be engaged 90 days ahead. There is a good business in lap welded sizes, but most producers are able to promise deliveries in four to five weeks. There continues to be much talk of a possible advance in steel pipe on the ground that the rise in this product has been only about half that in other finished steel lines, but as yet no definite steps looking toward higher prices have been taken. Discounts are given on page 315.

Hot-Rolled Flats.—New demands, if anything, are lighter than they have been but makers are heavily committed and consumers are specifying freely. The market is firm at 2.50c., base, Pittsburgh, for hoops, bands and hot-rolled strips, with now and then some sales carrying prompt delivery assurances as high as 2.75c. Some mills failed to complete rollings of cotton ties in advance of the opening of the season and having orders to get out are turning down inquiries for narrow, light-gage stock. The August price for cotton ties is $1.11 per bundle of 45 lb., this being the established price of $1.10, plus the carrying charge of 1c. per bundle per month.

Plates.—It is still easier for buyers to interest the mills in plates than in any of the other heavier products. Not much railroad business has lately come into this market, but considerable new tank business for Wyoming and Oklahoma has been placed with local builders. One order for Wyoming calls for 25 80,000-bbl. tanks, involving about 7500 tons of steel, while a recent order for 12 tanks of similar capacity for the Oklahoma field will take about 3500 tons of steel. Prices are firm within the recent range. Quotations are given on page 315.

Tin Plate.—Canning crops not only are abundant this year but matured earlier than usual and miscalculation as to requirements of tin plate has caused the container manufacturers to seek additional tonnages. This demand, coming at a time when maintenance of mill operations has been impossible owing to the fuel shortage, the situation in regard to supplies is tight. Prices are unchanged but may be said to be firm.

Cold-Rolled Strips.—Makers are not very anxious for additional business as their present obligations are sufficient to carry them through the present quarter, and there is a possibility that there may be a carryover into the fourth quarter, in view of the restrictive influence of the coal strike situation upon steel production. The market still is quotable at 4c., base, Pittsburgh, but premiums of as much as $5 per ton over this price have been paid for small tonnages for early delivery.

Sheets.—Demand has not decreased quite as much as that for some other finished lines and actually is still brisk from the automotive industry and with the mills obliged to curtail operations on account of the fuel shortage. The supply situation is really acute. Premiums for prompt shipments are much more common than they were recently. Prices are given on page 315.

Steel Skelp.—The market is quiet as far as actual sales are concerned, but this is due to the meagerness of available supplies rather than a lack of demand. Grooved skelp is wanted on account of a high demand for the smaller sizes of pipe and is quotable as high as 2c.; on sheared skelp the range is from 1.70c. to 1.80c.

Wire Rods.—On a few small tonnages, urgently wanted, as high as $45 is reported to have been done and one large independent producer, who for some time has been quoting $43 on sizable lots, continues to hold to that price. Most of the tonnage moving carries a price of $40 for the base size of soft rods, but that figure now is not interesting to independent makers on fresh inquiries.

We quote No. 5 common basic or Bessemer rods to domestic consumers, $40 to $43; chain rods, $40 to $43; screw stock rods, $45 to $48; rivet and bolt rods and other rods of that character, $40 to $43; high carbon rods, $47 to $53, depending on carbon, per gross ton, f.o.b. Pittsburgh or Youngstown.

Steel Rails.—There is a fair amount of current business in light rails, and since those that are wanted must be shipped out immediately, some of the mills are getting as high as 2c. out of stock. The regular mill base, however, is unchanged at 1.75c., base, for those sections rolled from new steel.

We quote 25 to 45-lb. sections, rolled from new steel, 1.75c. base; rolled from old rails, 1.60c. to 1.65c. base; standard rails, $40 per gross ton mill for Bessemer and open-hearth sections.

Structural Material.—Fabricating interests here report increased difficulty in securing deliveries of plain material, and some of them are unable to quote against current projects because of their inability to make deliveries within the specified time. Stronger prices are indicated in recent bids on new structural jobs, but the complaint still is heard that fabricated steel has not advanced in keeping with plain material. Prices are given on page 315.

Spikes.—Railroads tributary to this city appear to be well covered against their immediate requirements of spikes and other track equipment and new inquiries are few and small. There is no change in prices. Quotations are given on page 315.

Nuts and Bolts.—Buyers entered heavy orders for third quarter delivery prior to an advance which became effective July 1, and while specifications are coming in freely strictly new business is of very moderate proportions. Discounts are given on page 315.

Coke and Coal.—Coal prices have declined about $1 per ton since a week ago, the range now being $7 to $7.50 as against $8 to $8.50 recently. Available supplies are no larger, but the feeling that when the Government plans really become operative, prices will be more reasonable, has led to the withdrawal of a good many buyers from the market. The few lots of Beehive oven coke reaching the market are selling at $14 to $14.50 for furnace grade and at $14.50 to $15.00 for foundry coke.

Old Material.—If there is a definite tendency to prices, it is toward lower levels, due to the fact that a large majority of consumers in this district are out of the market on account of the uncertainty about fuel supplies. Some mills are holding up shipments against contracts, and it is the reconsigning of these tonnages that tends to weaken prices. General offerings of old material are moderate and the market is not likely to be flooded by railroad scrap right away, since on account of the shortage of coal the railroads are unlikely to give early attention to the collection and loading of road scrap, while production is likely to be affected so long as the strike of the shopmen continues. On the basis of recent transactions, including a purchase of about 12,000 tons by a large independent steel company, the market on heavy melting steel is quotable from $17 to $17.50. The market is slightly stronger on old rails for rolling, but rules a shade easier on most kinds of cast scrap and on the blast furnace grades. Bids were opened this morning on about 17,000 tons of scrap offered by the Pennsylvania Railroad, Eastern region.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows per gross ton:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh	$17.50 to $17.50
No. 1 cast, cupola size	19.00 to 19.50
Rails for rerolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	17.50 to 18.00
Compressed sheet steel	16.00 to 16.50
Bundled sheets, sides and ends	15.00 to 15.50
Railroad knuckles and couplers	18.00 to 18.50
Railroad coil and leaf springs	18.00 to 18.50
Low phosphorus standard bloom and billet ends	20.00 to 20.50
Low phosphorus plates and other grades	19.00 to 19.50
Railroad malleable	16.00 to 16.50
Iron car axles	26.00 to 26.50
Locomotive axles, steel	25.00 to 25.50
Steel car axles	17.50 to 18.00
Cast iron wheels	18.00 to 18.50
Rolled steel wheels	18.00 to 18.50
Machine shop turnings	13.75 to 14.25
Sheet bar crop ends	19.50 to 20.00
Heavy steel axle turnings	15.00 to 15.50
Short shoveling turnings	15.00 to 15.50
Heavy breakable cast	18.00 to 18.50
Stove plate	14.50 to 15.00
Cast iron borings	15.50 to 16.00
No. 1 railroad wrought	15.00 to 15.50

Wholesale Trade in New York in June

The dollar value of June sales of 122 wholesale dealers in the New York Federal Reserve Bank district was about the same as in June of last year. This is the third month this year that sales have been practically equal to those of the corresponding month of 1921. The value of sales during the first half of the present year was 2 per cent below sales for January to June, 1921.

In June for the first time since the fall of 1920, sales of machine tools were larger than in the corresponding month of the preceding year, reflecting increased activity in industrial plants. The larger volume of building is apparent in the sales of hardware dealers, which increased 12 per cent over those of June, 1921.

Grocery dealers report an increase of 7 per cent in June sales, the largest gain recorded this year, and probably due, in a measure, to somewhat higher prices.

Chicago

Pig Iron Production Checked More Than Steel—Demand Surprisingly Strong

CHICAGO, Aug. 1.—The coal and railroad strikes have progressed to the point where they are causing both producers and users of iron and steel to curtail operations. Four steel works blast furnaces and one merchant stack have been banked with the certainty that others will become inactive unless fuel becomes more plentiful. Steel output has not declined in proportion to pig iron production, owing to the greater use of scrap in the open hearth furnaces. Notwithstanding the loss of two blast furnaces at Gary and two at South Works, reducing its total active stacks to 16 out of 29, the Illinois Steel Co. is producing steel at the rate of 78 per cent of capacity as against 84 per cent last week. The Inland Steel Co. continues to operate at 65 to 70 per cent of capacity.

In view of the uncertain fuel situation, it was rather surprising that steel demand shows so little change. For a leading local producer, specifications passed to the mills for execution are substantially as heavy as in previous weeks, inquiry is slightly heavier, while new business booked is a little lighter. The explanation seems to lie in the fact that certain important classes of consumers continue to buy steel, despite serious current industrial difficulties. The railroads are still placing large orders for cars and car repairs as well as for track material and are apparently anxious to carry out their program despite the fact that they now realize that these programs cannot be completed this year.

Automobile manufacturers are endeavoring to buy for 60 to 90 days ahead and even further, whereas until recently they adhered to a hand-to-mouth policy of purchasing. Building activity is still flourishing, as evidenced by numerous structural awards and inquiries. There appears to be a feeling among users that the present is a good time to buy, even though deliveries may be distant. This sentiment may be due to the belief that it will take steel producers months to rebuild their fuel stocks, and in the meantime the tendency of prices may continue to be upward.

As against this it is argued in some quarters that in the scurry to get material there has been considerable duplication of both inquiries and orders. Owing to their crippled operations, however, mills are carefully scrutinizing business offered them and in some cases are limiting their new sales to old customers.

Ferroalloys.—Ferromanganese por prompt shipment has advanced to a minimum of $75, f.o.b., New Orleans, but still can be bought for late September and October shipment at $67.50. Fifty per cent ferrosilicon is available at $57, delivered, for both spot and future shipment.

We quote 78 to 82 per cent ferromanganese, future, $75.06; prompt, $82.56, delivered; 50 per cent ferrosilicon, $57, delivered; spiegeleisen, 18 to 22 per cent, $46, delivered.

Pig Iron.—With an acute scarcity of fuel staring them in the face, local producers have advanced their prices to $28, base, furnace, on spot and a minimum of $26 on contract iron. One dollar extra is charged for each ½ per cent increase in silicon content above the base grade. The Southern furnace, which has been selling at $18.50, base, Birmingham, has withdrawn from the market, so that the present minimum quotation of Southern foundry is $20. Even the latter price is practically nominal, as it is exceedingly difficult to get delivery on the Southern product, because of car shortage. Consignments of Southern iron which have been in transit four and five weeks have not yet reached destination. The policy of buyers at present seems to be one of caution, dictated by uncertainty as to fuel supplies. The principal demand is for spot iron to take care of immediate needs, as an absolute suspension of operation may become necessary if the coal strike is not settled. One of the largest recent sales was 1500 tons of malleable iron to a Wisconsin melter, 500 tons for prompt shipment and the remainder for later delivery. Most orders cover small lots, ranging from a carload up to a few hundred tons. Charcoal iron has advanced to $30, base, furnace.

Quotations on Northern foundry, high phosphorus malleable and basic irons are f.o.b. local furnace and do not include a switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards, or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$33.15
Northern coke, No. 1, sil. 2.25 to 2.75	$27.00 to 29.00
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	26.00 to 28.00
Northern high phos	26.00 to 28.00
Southern No. 2	26.00
Malleable, not over 2.25 sil	26.00 to 28.00
Basic	26.00 to 28.00
Low phos. Valley furnace, sil. 1 to 2 per cent copper free	34.00 to 35.00
Silvery, sil. 8 per cent	37.29

Bars.—Prices on soft steel bars for indefinite delivery are unchanged, but for specific shipment, material is difficult to obtain and quotations are steadily advancing. The minimum price for early shipment in this market appears to be 2.15c., Chicago, while Eastern mills are booking business at 1.85c. to 2c., Pittsburgh. In the opinion of some observers the scurry for bars by users has made the volume of inquiry appear larger than it actually is. Bar iron is firm at a minimum of 2c., Chicago, and one important mill is taking new business only on the basis of prices ruling at the time of shipment. High fuel costs are a source of great concern to these mills and it is intimated that the situation may force one or more producers to suspend operations. The Moline, Ill., rail and steel bar plant of the Republic Iron & Steel Co., started up to-day with a comfortable back log. This mill is quoting 1.65c. to 1.70c., f.o.b Moline, while Chicago Heights rail steel makers are practically out of the market, with nominal quotations of 1.70c. to 1.80c., Chicago. Bar iron, two cents.

Mill prices are: Mild steel bars, 1.75c. to 2.15c., Chicago; common bar iron, 2c., Chicago; rail steel, 1.70c. to 1.80c., mill or Chicago.

Jobbers quote 2.60c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.55c. for rounds and 4.05c. for flats, squares and hexagons. Jobbers quote hard and medium deformed steel bars at 2.50c. base; hoops, 3.60c.; bands, 3.35c.

Bolts and Nuts.—Some makers continue to accept specifications at the discounts of May 11, but the dominant tendency of the market is toward firmness at the July 1 prices. Demand from farm implement makers is steadily improving and buying by automobile manufacturers is heavy. The latter have abandoned their policy of buying for immediate needs and are now trying to cover for 60 to 90 days ahead. The discounts on page 315 apply in this territory except that they are f.o.b., Chicago, instead of f.o.b., Pittsburgh.

Jobbers quote structural rivets, 3.25c.; boiler rivets, 3.35c.; machine bolts up to ⅞ x 4 in., 50, 10 and 10 per cent off; larger sizes, 50 and 10 off; carriage bolts up to ⅞ x 6 in., 50 and 5 off; larger sizes, 45 off; hot pressed nuts, squares and hexagons, tapped, $3.25 off; blank nuts, $3.50 off; coach or lag screws, gimlet points, square heads, 60 per cent off; quantity extras are unchanged.

Wire Products.—Production has been materially curtailed both by shortage of steel and labor. Demand still exceeds the ability of the mills to deliver in all classes of products. It is probable, however, that if mill output were normal, little trouble would be experienced in meeting the needs of consumers. For mill prices see finished iron and steel, f.o.b. Pittsburgh, page 315.

We quote warehouse prices, f.o.b. Chicago: No. 9 and heavier black annealed wire and No. 9 and heavier bright basic wire, $2.95 per 100 lb.; common wire nails, $3.10 per 100 lb.; cement coated nails, $2.60 per keg.

Sheets.—There is a healthy demand for blue annealed, while inquiries for galvanized are particularly heavy. Black sheets alone lag. The situation is the reverse of that which obtained early in the year, when sales of black were heavy and the demand for galvanized was slack. The change is explained by the fact that the farmers who are large consumers of galvanized sheet steel products have commenced to buy on a broad scale. Purchases of sheets for corrugated roofing are especially liberal. Sheets for early delivery are difficult to obtain.

Mill quotations are 3.15c. to 3.30c. for No. 28 black, 2.40c. to 2.50c. for No. 10 blue annealed and 4.15c. to 4.30c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote blue annealed, 3.75c.; black, 4.45c.; galvanized, 5.45c.

Plates.—The price situation shows little change, but material for early delivery is difficult to obtain. The Illinois Steel Co. continues to quote 1.75c., Chicago, for indefinite delivery, while the Inland Steel Co. is still able to take a limited tonnage of certain sizes of heavy sheared plate for six to nine weeks delivery. Owing to sharp reductions in the operations of Eastern mills, consumers no longer find it easy to secure material for early shipment from points outside the Chicago district. Demand is still flourishing with additional cars and car repairs being placed by the railroads and further inquiry for oil storage tanks. The contract for 25 oil tanks for the Sinclair properties in the Wyoming field is about to be awarded.

The mill quotation is 1.75c. to 2c., Chicago. Jobbers quote 2.70c. for plates out of stock.

Structural Material.—Structural lettings for the week have been heavy and new inquiry is large. Plain material for early delivery, however, is difficult to obtain. The Illinois Steel Co. continues to quote 1.75c., Chicago, for indefinite shipment, while the Inland Steel Co. is out of the market except for an occasional size on which it can make from six to nine weeks' delivery. The minimum price for specific delivery is 2c., Chicago, but Eastern mills are experiencing no difficulty in booking orders at 1.90c. to 2c., Pittsburgh.

The mill quotation on plain material is 1.75c. to 2c., Chicago. Jobbers quote 2.70c. for plain material out of warehouse.

Warehouse Prices.—Local jobbers have reduced prices on wire and nails 15c. to 30c. per 100 lb. The new quotations are published under "Wire Products."

Rails and Track Supplies.—Demand for track supplies is active, although as a rule individual orders are smaller than some time ago. An exception is a current inquiry for 7000 tons of tie plates. After a long period of slack demand, a number of small inquiries for light rails have been received from coal operators, evidently indicating a desire to repair their lines in anticipation of an early reopening of their mines. Prices are unchanged.

Standard Bessemer and open-hearth rails, $40; light rails rolled from new steel, 1.75c. f.o.b. makers' mills.

Standard railroad spikes, 2.25c. to 2.35c., Pittsburgh; track bolts with square nuts, 3.25c. to 3.35c., Pittsburgh; tie plates, steel and iron, 1.85c. to 2c., f.o.b. mill; angle bars, 2.40c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.30c. base and track bolts 4.30c. base.

Reinforcing Bars.—Recent lettings include: Research Laboratory, Pittsburgh Plate Glass Co., Milwaukee, 125 tons, to Concrete Steel Co.; Thirty-Ninth Street Sewer, Chicago Sanitary District, 600 tons, to Concrete Steel Co.; High School, Houghton, Mich., 150 tons, to Corrugated Bar Co.; highway work, Kentucky, 150 tons, to Corrugated Bar Co.; High School, Ft. Madison, Ia., 150 tons, to Corrugated Bar Co.; Nelson Building, Davenport, Ia., 150 tons, to Corrugated Bar Co.; Benz Hotel, St. Paul, 150 tons, to Corrugated Bar Co. Pending business includes: Masonic Temple, St. Louis, 800 tons; High School, Wichita, Kan., 400 tons.

Steel Castings.—Steel foundries are generally very busy and current discounts on castings are very firm with the prospect of another advance within thirty days. The coal shortage is not affecting steel foundries as adversely as other foundries, because their furnaces largely burn oil or are operated by electricity.

Cast-Iron Pipe.—Prices have again advanced to a range of $38 to $39, base Birmingham, for 6 in. and larger. St. Paul, Minn., has let 535 tons to National Cast Iron Pipe Co. Other lettings are small or private.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $50.20 to $51.20; 6-in. and above, $46.20 to $47.20; class A and gas pipe, $3 extra.

Coal and Coke.—The local producer of by-product foundry coke will take no new business except on the basis of the price ruling at time of delivery. The Southern producer of by-product foundry coke, which recently took some business in this district, has withdrawn from the market. Plants using coal are experiencing great difficulty in getting deliveries, owing to car shortage and at the same time find prices so high as to make operation practically prohibitive. Western Kentucky bituminous coal is now bringing from $13.50 to $15, delivered Chicago. Malleable foundries are particularly hard hit by the situation and bar iron rolling mills are also in a tight position with the possibility of a complete shut down.

Old Material.—A moderate revival in buying, made up largely of small individual purchases together with a limited available supply of scrap, has given the market a stronger tone and has resulted in advances in a number of grades. While the fuel situation has caused consumers of scrap to buy from hand to mouth, it is also true that scrap offerings have declined sharply. The shopmen's strike has materially reduced the offerings of the railroads, the largest producers of scrap, while industrial concerns are neglecting to prepare their scrap for shipment owing to a shortage of labor. Consumption of open hearth grades by the Steel Corporation subsidiary has increased as the result of the banking of 4 blast furnaces. Railroad offerings include the Chicago & Northwestern, 2400 tons; the Wabash, 500 tons of miscellaneous scrap from dismantled cars, and the New York Central, the Michigan Central and the Grand Trunk, blind lists.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$19.00 to $19.50
Cast iron car wheels	19.50 to 20.00
Relaying rails	22.50 to 27.50
Rolled or forged steel car wheels	18.50 to 19.00
Rails for rerolling	16.50 to 17.00
Steel rails, less than 3 ft	17.50 to 18.00
Heavy melting steel	15.50 to 16.00
Frogs, switches and guards cut apart	16.50 to 16.00
Shoveling steel	15.00 to 15.50
Drop forge flashings	11.50 to 12.00
Hydraulic compressed sheet	13.00 to 13.50
Axle turnings	13.50 to 14.00
Per Net Ton	
Iron angles and splice bars	18.00 to 18.50
Steel angle bars	14.75 to 15.25
Iron arch bars and transoms	18.50 to 19.00
Iron car axles	23.00 to 23.50
Steel car axles	15.75 to 18.25
No. 1 busheling	12.50 to 13.00
No. 2 busheling	7.25 to 7.50
Cut forge	13.75 to 14.25
Pipes and flues	11.00 to 11.50
No. 1 railroad wrought	14.25 to 14.75
No. 2 railroad wrought	13.75 to 14.25
Steel knuckles and couplers	16.25 to 16.75
Coil springs	16.50 to 17.00
No. 1 machinery cast	17.00 to 17.50
No. 1 railroad cast	16.00 to 16.50
Low phos. punchings	15.00 to 15.50
Locomotive tires, smooth	13.00 to 13.50
Machine shop turnings	9.00 to 9.50
Cast borings	11.25 to 11.75
Stove plate	14.75 to 15.25
Grate bars	14.25 to 14.75
Brake shoes	14.00 to 14.50
Railroad malleable	16.00 to 16.50
Agricultural malleable	16.00 to 16.50

National Industrial Conference Board on Situation

The National Industrial Conference Board, in its weekly radio review of industrial conditions, says:

"Railroad executives report that the roads are in good condition, that traffic has been little disturbed and that new men are rendering satisfactory service. Railroad shopmen on strike are reported as in more tractable mood and as willing to return to work on terms specified by President Harding provided satisfactory arrangements are made over the question of seniority.

"In his conferences with the strikers the President is understood to have insisted that the Labor Board's decisions be recognized and obeyed by both sides, that the strikers return to work and request a rehearing of their grievances, and has agreed also to request railroad executives to restore the strikers' former seniority privileges but that shopmen who remained at work shall be advanced in rating over the strikers. The question of seniority is a major consideration with railroad employees since it bears relation not only to pension privileges but determines the order in which men shall be discharged, men lowest in rank of seniority being the first to be laid off when discharges are ordered.

"While current strikes have tended to impede business recovery, business generally is good. Retail trade in many districts is reported satisfactory.

New York

Little Domestic Pig Iron Available—Foundries Inquiring, But Are Buying Sparingly

NEW YORK, Aug. 1.—There is no excitement in the market in view of the further tightening of the situation in pig iron and in fuel. A few buyers have inquired for pig iron for August and September deliveries and perhaps 1500 tons in all has been closed for early delivery in the past week. The foundries are showing more interest in foreign iron, for which prices have advanced from $1 to $2 per ton over the recent low point. Large purchases of coal have been made in England, but deliveries are uncertain and ocean freights are high. A New England by-product coke plant is out of the market in view of the cutting off of domestic coal supply.

Pig Iron.—Pending inquiries for iron amount to 1500 to 2000 tons. A near-by New York State foundry bought 400 tons of No. 1X iron for delivery within the week. One Connecticut interest has inquired for 900 tons of foundry iron in the last quarter and first quarter. Another New England inquiry is for 500 tons of malleable and a Connecticut foundry has asked for 500 tons of No. 2X. In the New York district there is an inquiry for 150 tons of high silicon iron for early delivery. Eastern Pennsylvania furnaces are quoting $28 to $29.50 for 2X iron, but little is available. Some Buffalo furnaces have put their price for prompt No. 2X at $28 at furnace, but there is still some Buffalo iron offered at $25 for delivery over the remainder of the year. A New York buyer came into the market for 1000 tons of foundry iron and has closed for 500 tons of Scotch iron. The latter could be had this week at $27, f.o.b. New York, but as high as $30 has been paid for Scotch iron delivered in Brooklyn. Most foundries are well provided with coke, but the few that needed to buy have found prices soaring, $16 to $17 at ovens being asked for foundry coke. Most furnaces have no iron to offer and in general foundries are unwilling to take the risk of present prices for deliveries running late into the year. No buying has resulted, as far as can be learned, from the three inquiries reported last week, one from a boiler company, another from a New Jersey foundry and a third from Springfield, Mass. On a New York State inquiry which came up last week $29.50, delivered, was quoted on Southern No. 1 iron. Foundries are getting little or no advance in prices of castings, to compensate for the high prices they are paying for pig iron, and evidently fear that any advance would curtail business.

We quote delivered in the New York district as follows, having added to furnace prices $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$31.77 to $32.77
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	30.77 to 31.77
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	29.77 to 30.77
Buffalo, sil. 1.75 to 2.25	30.91 to 31.91
No. 2 Virginia, sil. 1.75 to 2.25	29.44 to 30.44

Finished Iron and Steel.—Regular mill customers are having difficulty in getting their normal monthly amounts of steel—in some cases, indeed, being told that they cannot expect current deliveries. In that the uncertainty is greater than it was a week ago, the steel situation is worse and urgent buying naturally begets premium prices. Going business is reported at 1.80c. to 2c., Pittsburgh basis, on plates, shapes and bars. There are still those who entertain inquiries, but it appears the list of mills which are out of the market has been enlarged, although one mill which would not quote a week ago on material like plates will consider fresh business at a 2c. basis. Plates are, if anything, stronger than bars or shapes, and it is difficult to buy any of these forms of steel at less than 1.80c., Pittsburgh, for any reasonable delivery. A surprisingly large amount of fabricated steel work keeps coming before the trade, but nothing of moment is noted in railroad equipment buying in the East other than large locomotive purchases reported elsewhere. Bar iron has strengthened and we recognize a range of prices as noted below.

We quote for mill shipments, New York, as follows: Soft steel bars, 2.04c. to 2.24c.; structural shapes, 2.04c. to 2.19c.; bar iron, 1.94c. to 2.04c.; and steel plates, 2.04c. to 2.34c. On export shipments the freight rate from Pittsburgh to New York is 28.5c. per 100 lb., while the domestic rate is 34c.

Ferroalloys.—Demand for ferromanganese is confined to small and large lots for August shipment, which can be obtained and which have been sold at $67.50 to $70, seaboard. The spiegeleisen market is quiet and quotations are unchanged. There is a moderate demand for 50 per cent ferrosilicon at unchanged quotations. The uncertainty as to the future of the industrial situation has had its effect on these markets. Quotations are as follows:

Ferromanganese, domestic, seaboard, per ton,	$67.50 to $70.00
Ferromanganese, British, seaboard, per ton,	$67.50 to $70.00
Spiegeleisen, 17 to 19 per cent.	$35.00
Spiegeleisen, 20 per cent.	$36.00
Ferrosilicon, 50 per cent, delivered, per ton,	$52.00 to $55.00
Ferrotungsten, per lb. of contained metal.	40c. to 50c.
Ferrochromium, 6 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr., delivered	12c. to 14c.
Ferrovanadium, per lb. of contained vanadium,	$3.00 to $3.50
Ferrocarbontitanium, 15 to 18 per cent, 1 ton to carloads, per ton.	$200.00
Ores	
Manganese ore, foreign, per unit, seaboard	26c. to 30c.
Tungsten ore, per unit, in 60 per cent concentrates, nominal	$3.00 up
Chrome ore, basis 48 per cent Cr_2O_3, crude, per unit, Atlantic seaboard	40c. to 45c.
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	40c. to 45c.

High-Speed Steel.—Both the price and business conditions in this market continue unchanged. Producers continue to quote 18 per cent tungsten high-speed steel at 75c. per lb., base, with special brands of some companies selling up as high as 95c. per lb.

Cast-Iron Pipe.—Prices are firm and demand is still heavy for the smaller sizes. The city of Buffalo is asking for bids on 12,000 ft. of 6-in. pipe. Deliveries in this district are from six to eight weeks. We quote, per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $53.50; 4-in. and 5-in., $58; 3-in., $63.80, with $4 additional for Class A and gas pipe.

Old Material.—The market is strong and prices firm with an upward tendency. Heavy melting steel is quotable at $10.50 to $11 per ton, the high price being well established in this district based upon shipments being made by one dealer to Buffalo by barge, the low freight rate thus obtained warranting higher prices. Steel is also being shipped to Monessen, Alan Wood, Jones & Laughlin, Bethlehem and the American Sheet & Tin Plate Co. Stove plate is slightly stronger than for several weeks past, one dealer in this district having closed on a tonnage which figures back to a basis of $11 per ton.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard	$10.50 to $11.00
Steel rails, short lengths, or equivalent	11.25 to 11.75
Rerolling rails	11.50 to 12.00
Relaying rails, nominal	27.00 to 28.00
Steel car axles	16.00 to 17.00
Iron car axles	22.00 to 23.00
No. 1 railroad wrought	12.50 to 13.00
Wrought iron track	11.00 to 11.50
Forge fire	8.00 to 8.50
No. 1 yard wrought, long	10.50 to 11.00
Cast borings (clean)	9.25 to 10.25
Machine-shop turnings	9.25 to 10.25
Mixed borings and turnings	9.25 to 10.25
Iron and steel pipe (1 in. diam., not under 2 ft. long)	9.00 to 9.50
Stove plate	10.50 to 11.00
Locomotive grate bars	11.50 to 12.00
Malleable cast (railroad)	10.50 to 11.00
Cast-iron car wheels	13.00 to 13.50

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast	$18.00 to $19.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	16.50 to 17.00
No. 1 heavy cast, not cupola size	13.00 to 13.50
No. 2 cast (radiators, cast boilers, etc.)	12.00 to 12.50

Warehouse Business.—The situation is unchanged in this district. Prices are firm and business fairly active. Open-hearth spring steel is now quoted at 4c. to 6c. per lb. Sheets are still weak, but reported sales of black and galvanized sheets on a basis of 4c. and 5c. per lb.,

base, are far less numerous than formerly. The minimum price now obtainable is probably close to 4.20c. and 5.20c. per lb., base, on black and galvanized respectively, with sales of small lots ranging as high as 4.50c. and 5.50c. per lb., base. Brass and copper warehouses have again advanced prices on both brass and copper products, and report better business than at any time since purchasing by manufacturers of radio equipment ceased several weeks ago. We quote prices on page 336.

Philadelphia

Prices Climbing Especially in Pig Iron—Uncertainties of Priority System Dominate

PHILADELPHIA, Aug. 1.—The situation due to the railroad and coal strikes is going from bad to worse, and the iron and steel trade of the eastern Pennsylvania district does not know to-day what new conditions it may have to face to-morrow. Coal priorities have not as yet seriously complicated the muddle, but this is due to the fact that the Government plan has not been fully worked out. The fear is that when the preferred priorities have been taken care of the supply of coal and coke for steel plants and blast furnaces, already inadequate, will be further restricted and that more widespread banking of blast furnaces and slowing down of steel plant operations are inevitable. Even a settlement of the railroad strike, it is believed here, would not materially improve the situation, as there would immediately be a demand for coal from so many sources that industrial plants, fourth on the list, would not fare well for the next 30 or 60 days at least.

In the New River coal and coke field, car distrubutors have already been posted by the Federal board and cars are being allocated to the mines and coke ovens and shipments are being made as the Government directs. As yet this supervision has not extended to all districts, but it soon will become more comprehensive. As an example of the way the priorities are working, it is pointed out that 5000 tons of blast furnace coke, in storage at a Virginia blast furnace, would quickly be purchased by some eastern Pennsylvania furnace, but the railroads will not move it for such destination, and if sold it will probably go to a public utility plant.

The uncertainties the iron and steel trade is facing has resulted in less and less business being done. While there is no overwhelming demand for iron or steel, more orders are being offered than mills and furnaces are willing to accept. Prices continue their upward climb, particularly on pig iron, which is at least $1 to $2 a ton higher than a week ago.

Pig Iron.—Blast furnace operators do not seem to know just how the coal priority plan of the Government is going to affect them, but they fear the worst, especially as industrial plants generally are fourth on the list and presumably will not get coke until the preferred classifications are taken care of. The Coatesville furnace of the Midvale Steel & Ordnance Co., which has been furnishing some iron for merchant trade, was blown out on Sunday due to coke shortage. Other active furnaces are in a precarious position as to coke supply, but have little definite information as to whether their supply will be cut off entirely. Under these uncertain conditions iron prices have soared and $30 has been reached on foundry iron. On limited tonnages to regular customers two furnaces are quoting $28 to $30, furnace, on No. 2 plain and $29 to $31 in No. 2X. Sales of imported iron constitute the chief activity. Several lots of 1000 tons or more have been sold to cast iron pipe makers and small lots, usually not over 100 or 150 tons, have been sold to gray iron foundries. In all, possibly 10,000 tons of foreign iron have been disposed of in this market in the past few weeks. Prices range from $23.50 to $24 on French iron; from $26 to $27 on Middlesborough (English) and from $27.50 to $28.50 on Scotch iron, these prices all being f.o.b. cars at Philadelphia docks. Some foundrymen are hesitant about using foreign iron in their mixtures, but are doing so because of their inability to obtain their regular domestic brands. A surprising feature of the present situation is that there seems to be no alarming scarcity of iron; in other words, the majority of consumers are wholly or partially covered for the next 30 days or more and unless there should be serious interruption of shipments they believe they will get along some way until the strikes are settled. A few inquiries for fourth quarter have appeared, but melters are in most instances disposed to await the outcome of the present difficulties before making further commitments. One lot of 5000 tons of basic pig iron has been sold at $25, furnace, and a recent sale of standard basic was at $26, furnace. Furnaces would now quote $27, furnace.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia, and include freight rates varying from 76 cents to $1.64 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$28.76 to $30.14
East. Pa. No. 2X, 2.25 to 2.75	29.76 to 31.14
East. Pa. No. 1X	30.76 to 32.76
Virginia No. 2 plain, 1.75 to 2.25 sil.	29.17 to 30.17
Virginia No. 2X, 2.25 to 2.75 sil.	30.17 to 31.17
Basic delivery eastern Pa.	26.75 to 27.25
Gray forge	27.00 to 28.00
Malleable	28.00 to 30.00
Standard low phos. (f.o.b. furnace)	30.00
Copper bearing low phos. (f.o.b. furnace)	30.00

Ferroalloys.—Spot carloads of ferromanganese have been sold at $72.50, seaboard. The domestic and English prices remain at $67.50, seaboard, but this is for delivery in September or later, with the buyer assuming full risk as to the duty which the new tariff bill may impose. Spiegeleisen is offered at $36, furnace, for 19 to 21 per cent.

Semi-Finished Steel.—The Pennsylvania Railroad has bought a tonnage of special quality forging billets, for which it paid as high as $46, base, Pittsburgh. Nominal quotations are $35, Pittsburgh, for rerolling quality and $40 for forging quality, but few makers are willing to sell at these prices to-day.

Plates.—The plate market is now firmly established at 1.80c., Pittsburgh, it being impossible to buy for less for early shipment, while on some business as high as 2c., Pittsburgh, has been paid. One Eastern plate company is limiting the amount which it will sell to any one customer. The coal situation is precarious and companies which are operating their plate mills have no idea as to how long they will be able to continue. The Lukens Steel Co., which had two of its open-hearth furnaces fitted up with oil-burning equipment some time ago, is now equipping other furnaces to burn oil. As it had no oil storage facilities, the company has leased 10,000 gal. tank cars for this purpose. The Pennsylvania Railroad has bought about 5000 tons more of car repair material, making about 17,000 tons in the past two or three weeks, and it is stated that more will be bought shortly. As there are few mills able to make early deliveries of plates, the demands upon these mills are considerable and business is being turned away. We quote the market at 1.80c. to 2c., Pittsburgh.

Structural Material.—It is becoming more difficult to place orders for plain material and mills which are accepting business are doing so with qualifying clauses which protect them in case it is impossible, through coal shortage or railroad embargoes, to make shipment as promised. The mills are having no trouble in getting 1.75c. to 1.80c., Pittsburgh.

Bars.—The minimum for soft steel bars is 1.80c., Pittsburgh, and it is not easy to place orders even at this price with any degree of assurance as to deliveries. One leading maker is still out of the market and will take no further business, according to present intentions, until the coal and coke situation is clearer. Some makers of bar iron are now quoting 1.80c., Pittsburgh, for carload lots, while the minimum appears to be 1.70c. for carloads and 1.90c., Pittsburgh, for less than carloads.

Sheets.—Makers of sheets are exacting premium prices for prompt delivery material, these prices being several dollars a ton above the third quarter contract prices. As high as 2.75c., Pittsburgh, has been obtained for blue annealed sheets by one maker.

Warehouse Business.—Jobbers are doing a very satisfactory business under present conditions, as consumers are turning to them for supplies because of the fact that many of the mills are taking little or no business. We quote as follows for local delivery out of stock:

Soft steel bars and small shapes, 2.70c.; iron bars (except bands), 2.70c.; round edge iron, 2.90c.; round edge steel, iron finish, 1½ x ½ in., 2.90c.; round edge steel planished, 3.65c.; tank steel plates, ¼-in. and heavier, 2.80c.; tank steel plates, ⅜-in., 3c.; blue annealed steel sheets, No. 10 gage, 3.40c.; black sheets, No. 28 gage, 4.25c.; galvanized sheets, No. 28 gage, 5.25c.; square twisted and deformed steel bars, 2.80c.; structural shapes, 2.80c.; diamond pattern plates, ¼-in., 4.50c.; ⅜-in., 4.50c.; spring steel, 3.50c.; round cold-rolled steel, 3.35c.; squares and hexagons, cold-rolled steel, 3.70c.; steel hoops, No. 13 gage and lighter, 3.75c.; steel bands, No. 12 gage to ⅜-in., inclusive, 3.35c.; iron bands, 3.90c.; rails, 2.70c.; tool steel, 8c.; Norway iron, 5.50c.

Coke.—Prices paid for foundry coke range from $14 to $17, Connellsville. By-product coke from the plant of the Rainey-Wood Coke Co. is quoted at $16, Swedeland, Pa. Furnace coke is to be had in limited quantities at $14 to $15, Connellsville.

Old Material.—Steel scrap remains firm at $15, delivered, although there is very little demand. Prices generally are almost stationary and are holding well in view of the small volume of business that is being done. The only change is in cast scrap, which is slightly higher because of better demand. Foundries are evidently using more cast scrap on account of the shortage of pig iron. We quote for delivery at consumers' works in this district as follows:

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$15.00 to $15.50
Scrap rails	15.00 to 15.50
Steel rails, rerolling	17.00 to 17.50
No. 1 low phos., heavy 0.04 and under	22.00 to 24.00
Cast iron car wheels	17.50 to 18.50
No. 1 railroad wrought	17.50 to 18.50
No. 1 yard wrought	15.00 to 15.50
No. 1 forge fire	13.00 to 13.50
Bundled sheets (for steel works)	13.00 to 13.50
No. 1 busheling	12.50 to 13.00
No. 2 busheling	10.00 to 11.00
Turnings (short shoveling grade for blast furnace use)	13.00 to 13.50
Mixed borings and turnings (for blast furnace use)	13.00 to 13.50
Machine-shop turnings (for steel works use)	13.00 to 13.50
Machine-shop turnings (for rolling mill use)	13.50 to 14.00
Heavy axle turnings (or equivalent)	14.00 to 14.50
Cast borings (for steel works and rolling mills)	14.00 to 14.50
Cast borings (for chemical plants)	17.00 to 17.50
No. 1 cast	18.00 to 20.00
Railroad grate bars	14.50 to 15.00
Stove plate (for steel plant use)	15.00 to 15.50
Railroad malleable	15.00 to 15.50
Wrought iron and soft steel pipes and tubes (new specifications)	13.00 to 13.25
Shafting	20.00 to 20.50

Cincinnati

CINCINNATI, Aug. 1.

Pig Iron.—The market is tightening up, particularly in Northern irons, which are at least 50c. higher than last week. At southern Ohio furnace, $25 is now the absolute minimum, with some furnaces having iron on yards quoting as high as $27. In the South, the situation is also stronger, the low priced seller having withdrawn from the market during the week, leaving furnace prices at $19 to $20, with little iron available. However, Southern resale iron is still available at $18.50, but it is likely that this price will be withdrawn before the end of the week. There is little activity in the market, sales being confined mostly to carload lots. A local melter bought 800 tons last week, 300 Northern and 500 Southern. It is understood that the Northern iron was placed in three lots on a $24.50, Ironton basis, and the Southern from $18.50 to $19, Birmingham. Another melter took several hundred tons of Southern iron; special conditions attaching to the order, particularly with regard to prompt shipment, were responsible for a price of $20, Birmingham. Several sales of up to 300 tons were made at $18.50 to $19. Little Northern iron was dealt in, the largest sale reported being for 100 tons as reported above. There are few inquiries. An Indiana melter is inquiring for 750 tons, a central Ohio melter for 200 tons for the last quarter, and a Michigan melter for 300 tons for the third quarter. An offer to buy 1000 tons of Southern iron was turned down by a furnace, as the price, $18.50, was not attractive. A number of Southern furnaces have withdrawn from the market, leaving only about two active sellers, and silvery furnaces in Jackson county have also announced their withdrawal. Belfont furnace at Ironton and Milton at Wellston have been banked as a result of the shortage of coke. Norton furnace at Ashland is the only merchant furnace producing in the Ironton-Ashland district, but it is understood the Whitaker-Glessner stack at Portsmouth will go on foundry iron within the next week. The American Rolling Mill Co. has one stack at Ashland and one at Columbus in blast, and it is expected that the latter will continue indefinitely, as a coke supply for the next two months is practically assured.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$22.55 to $24.05
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	23.05 to 24.55
Ohio silvery, 8 per cent	34.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	27.27
Basic Northern	27.27
Malleable	27.27

Plant Operations.—No serious inconvenience has as yet been experienced by steel mills in this district as a result of the coal and rail strikes. While a number of merchant blast furnaces have been banked, steel-making furnaces are able to keep running. The American Rolling Mill Co., at Middletown, Ohio, has put the blooming mill on 24-hr. turn, three eight-hour shifts being installed. The Newport Rolling Mills Co. and the Andrews Steel Co. at Newport, Ky., while suffering a little inconvenience on account of delayed shipments, have been able to maintain their customary schedules. The same is true of the Whitaker-Glessner Co. at Portsmouth. This week is expected to be the crucial one for steel plants, but it is hoped it will be unnecessary to curtail operations.

Finished Materials.—The trade has apparently gained the idea that it is useless to attempt to get on the books of steel companies for some time to come. Practically all of the independent companies are now definitely out of the market on new business, but are still accepting specifications on contracts. The Steel Corporation is accepting business for indefinite delivery. Sheet mills are practically sold up for the third quarter, and are not anxious to accept any other orders for this delivery. Prices on all steel products, while having an advancing tendency, show little change over last week. Some plate mills are quoting 2.10c., but this is taken to mean that they are out of the market. On bars, shapes and plates, the range is 1.70c. to 1.80c., with little business being booked. Sheets are quoted quite generally at 2.40c. to 2.60c. for blue annealed, 3.15c. to 3.30c. for black and 4.15c. to 4.40c. for galvanized. The American Sheet & Tin Plate Co. is reported to be out of the market for the time being, as it is expected that some of its sheet and tin mills will have to suspend, owing to the fuel situation. Tin plate specifications are coming in fairly well. There is a better demand for nails, and shipments are coming through in fairly good time. On other wire products the market is quiet. A number of small structural awards were reported, but new inquiries were light. Bids on 400 tons of bars for a new academy for the Sisters of Mercy, Cincinnati, closed July 31.

Warehouse Business.—Jobbers report a pressing demand for steel products for immediate delivery, and some fair-sized orders for shipment out of stock were booked, including one order for 100 tons of reinforcing bars. Cold-rolled prices have been advanced $3 per ton to 3.50c. for rounds, and 4c. for flats, squares and hexagons. The demand for nails is increasing, and local jobbers have been forced to replenish their stocks from mills. Jobbers of bolts, nuts and rivets will likely make

a 5 per cent advance in their prices shortly, in line with higher prices recently announced by manufacturers.

Jobbers quote: Iron and steel bars, 2.75c. base; hoops, 3.60c.; bands, 3.35c. base; shapes and plates, 2.85c. base; reinforcing bars, 2.82½c. base; cold-rolled rounds, 3.50c. base; flats, squares and hexagons, 4c. base; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, 4.50c.; No. 28 galvanized sheets, 5.50c.; No. 9 annealed wire, $2.70 per 100 lb.; common wire nails, $2.85 per keg, base.

Coke.—There is a fair demand, but dealers report meeting with some resistance on the part of buyers to paying the high prices now ruling. However, melters covered by contracts are asking ovens to anticipate shipments. With the exception of Connellsville coke, which has sold as high as $16 to $17, prices show little change. By-product coke is available at $9, Connellsville basis, to regular customers, and August quotas are being filled at this figure. Wise County foundry coke is quoted at $10 to $10.50, and New River foundry at $8.50 to $12. Coke is moving in better volume, and shipments are going forward with more rapidity than has been the case for the last two weeks.

Old Material.—Local dealers report the scrap market as stagnant. Very little scrap is moving, as railroads have practically embargoed the use of open top equipment for other than coal movement. Mills are not concerned at present, and foundries, while showing more interest, are buying only from hand to mouth. Prices, which are unchanged, are regarded as nominal.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

	Per Gross Ton	
Bundled sheets	$8.00 to	$8.50
Iron rails	13.50 to	14.00
Relaying rails, 50 lb. and up	26.50 to	27.00
Rails for rerolling	13.50 to	14.00
Heavy melting steel	13.00 to	13.50
Steel rails for melting	13.00 to	13.50
Car wheels	14.50 to	15.00
	Per Net Ton	
No. 1 railroad wrought	11.50 to	12.00
Cast borings	9.00 to	9.50
Steel turnings	8.00 to	8.50
Railroad cast	14.00 to	14.50
No. 1 machinery	16.00 to	16.50
Burnt scrap	9.50 to	10.00
Iron axles	18.00 to	18.50
Locomotive tires (smooth inside)	11.00 to	11.50
Pipes and flues	6.50 to	7.00

St. Louis

ST. LOUIS, Aug. 1.

Pig Iron.—Further advances are expected. Pig iron is scarce, as the makers are well sold up on all grades. The greatest demand is for iron of a high silicon, inquiries being mostly for grades of 2.25 per cent and higher, but makers have very little of these grades; the East Side maker has none. Buying was only of small lots, and there is no call for large tonnages. Melters are fairly well supplied with iron, except high-silicon grades. They realize the situation and regard it useless to look far to the future. A report of the Federal Reserve Bank of St. Louis says that the melt of pig iron, according to the figures of the reporting interests, increased in the eighth reserve district approximately 5¾ per cent in June over May. Stove manufacturers, seven interests reporting to the bank, showed June sales from 23 to 51 per cent larger than a year ago, and about steady with the preceding month. The demand for ferroalloys has taken a sudden spurt, inquiries totaling 600 tons for various items coming from district users.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago and $5.17 from Birmingham and 81 cents average switching charge from Granite City:

Northern foundry, sil. 1.75 to 2.25 (third quar.)	$26.66
Northern malleable, sil. 1.75 to 2.25 (third quar.)	26.56
Basic (third quar.)	26.56
Southern foundry, all rail, sil. 1.75 to 2.25	24.48
Southern foundry, water and rail, sil. 1.75 to 2.25, f.o.b. St. Louis	22.17

Finished Iron and Steel.—Local fabricators report that there has been a marked falling off in inquiries. Business interests are said to be loath to enter any new building enterprises until the strike situation clears up. The contract is expected to be let this week for the American Can Co. building at New Orleans, involving 200 tons of structural steel and 500 tons of reinforcing bars, and word has been received here that the Virginia Bridge & Iron Co. received the contract for the 700 tons of structural steel to be used in the Ford Motor Co. assembly plant at New Orleans. Railroad inquiries were confined in the week to 3000 kegs of standard track spikes for the Missouri Pacific and 300 kegs for the St. Louis Southwestern. The railroad purchasing agents care only to talk to persons who sell coal. The only inquiries were for a few cars of sheets. Some of the largest steel mills are out of the market, due to heavy order files and curtailed production. Word has been received here that Inland Steel Co. has increased the price of plates from 1.80c., Chicago, to 2c. Warehouse prices are higher.

For stock out of warehouse we quote: Soft steel bars, 2.70c. per lb.; iron bars, 2.70c.; structural shapes, 2.80c.; tank plates, 2.80c.; No. 10 blue annealed sheets, 3.85c.; No. 28 black sheets, cold rolled, one pass, 4.45c.; cold drawn rounds, shafting and screw stock, 3.50c.; structural rivets, $3.35 per 100 lb.; boiler rivets, $3.45; tank rivets, ⅞ in. and smaller, 60 per cent off list; machine bolts, large, 50 and 10 per cent; small, 50-10 and 10 per cent; carriage bolts, large, 55-5 per cent; small, 60 and 10 per cent; lag screws, 60 per cent; hot pressed nuts, square or hexagon blank, $3.50; and tapped, $3.25 off list.

Coke.—The trade here is being overwhelmed with orders for coke, business reaching war-time proportions. The orders are coming in from the industries, and from the coal trade, the coal strike creating new users for coke as well as making it more difficult for producers of coke to get supplies of the raw material. The St. Louis by-product producers are out of the market, and are making only enough coke to take care of their water-gas contracts. The Granite City by-product producer is now quoting $11, f.o.b. furnace, for metallurgical coke, an increase of $2 a ton in the last two weeks. The demand for coke still exceeds production and stocks in storage have been heavily drawn on. Connellsville coke is quoted at $14 to $14.50 at the ovens, and prices are steadily mounting.

Old Material.—The market for old material is higher on several items, and the market continues strong. Not much material is coming in, shipments being held up on account of the railroad strike, and the railroads themselves are not offering any lists, as labor is too scarce and is needed for more urgent duties than assembling scrap. Buying of scrap by consumers has not been so heavy.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

	Per Gross Ton	
Old iron rails	$16.75 to	$17.25
Rails for rerolling	15.75 to	16.25
Steel rails, less than 3 ft.	16.25 to	16.75
Relaying rails, standard section	25.00 to	28.00
Cast iron car wheels	18.50 to	19.00
No. 1 heavy railroad melting steel	14.75 to	15.25
No. 1 heavy shoveling steel	14.00 to	14.50
Ordinary shoveling steel	13.75 to	14.25
Frogs, switches and guards, cut apart	15.25 to	15.75
	Per Net Ton	
Heavy axle and tire turnings	9.50 to	10.00
Steel angle bars	13.75 to	14.25
Iron car axles	23.50 to	24.00
Steel car axles	17.00 to	17.50
Wrought iron bars and transoms	19.00 to	19.50
No. 1 railroad wrought	13.50 to	14.00
No. 2 railroad wrought	13.00 to	13.50
Railroad springs	16.00 to	16.50
Steel couplers and knuckles	17.00 to	17.50
Cast iron borings	9.00 to	9.50
No. 1 busheling	11.75 to	12.25
No. 1 railroad cast	15.50 to	16.00
Stove plate and light cast	12.75 to	13.25
Railroad malleable	14.00 to	14.50
Pipes and flues	8.75 to	9.25
Machine shop turnings	9.25 to	9.75

Birmingham

BIRMINGHAM, Aug. 1.

Pig Iron.—One large furnace operator holding firmly for some time to a $20 base reports the sale of 1500 tons to Philadelphia for fourth quarter delivery at that price. Two were lots of 500 tons. Other sales reported, but believed to date back a week to ten days, were lots of 500 tons in Chicago and Cincinnati districts at $18.50. Sales of lots of that size made during the past week brought $19 and were made by maker lately selling on the $18.50 base. No Birmingham maker is longer quoting under $19. The Alabama Co. went out of market early in the week after doing a fairly good fourth quarter entrance business at $20. The Central Coal &

Iron Co. expects to resume at Holt furnace, which is under repairs, around Aug. 7. The Tennessee company resumed at a third Bessemer furnace on July 22 and has nine in operation, six on basic, two on foundry and one on ferro. This is up to maximum of the war period and the subsequent inflation period. None of the blast furnaces has suffered from a production standpoint and fuel priorities will not hamper them. The Woodward Iron Co. and the Tennessee company are fully self-sustaining, the Sloss-Sheffield Steel & Iron Co. and the Central Coal & Iron Co. supply municipalities with gas and other companies will scarcely be called on to divert their own coal to commercial purposes. No foundries, or machine shops, and no pipe works have been affected as to production and do not apprehend it. All mills manage to get production started to destination with few exceptions, but none can tell when cars will arrive.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	$19.00 to $20.00
Basic	18.50 to 19.00
Charcoal, warm blast	30.00 to 32.00

Finishing Mills.—All steel mills have weathered strikes so far as production is concerned. The Tennessee company continues double turn at finishing mills and 100 per cent in ingot mill this week. The Gulf States Steel Co. has gone back to three open hearth furnaces because the supply of steel has caught up with finishing capacity. The rod mill of this company is turning out 272 tons a day, a new July record, it is reported. The Conners Steel Co. has been piling crossties, but this week began to move them to Texas points. Bar demand is very strong.

Cast Iron Pipe.—All pressure pipe shops are on full turn. New business was small this week owing to the general state of uncertainty. Base is firm at $37 minimum. The sanitary pipe base of $65 has disappeared and $60 is the new high. The former base was really a bonus for quick delivery. All shops are busy, but report poor deliveries.

Coal and Coke.—The base price under new Hoover agreement is $2.60, Pratt seam, which will do away with recent spot prices of as high as $4. Two Western carriers have given orders for all the coal that can be furnished them. Mine production went to 370,000 tons week of July 22, making a new high record for the past five years. The Semet-Solvay Co. fired its 60 idle ovens this week and went to 100 per cent of operations, an increase since July 1 of 100 per cent. All 240 ovens are now active. The Republic Iron & Steel Co. and the Alabama Co. are among the concerns using the supply, furnishing their own coal. Coke remains at $5.50 to $6.

Old Material.—Largest interests have lately paid $12 for No. 1 steel. That market seems stronger than it has been in a long time. Quoted prices are firm.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails	$13.00 to $15.00
No. 1 steel	12.00 to 14.00
No. 1 cast	15.00 to 16 00
Car wheels	14.00 to 15.00
Tramcar wheels	13.00 to 14.00
Stove plate	13.00 to 14.00
Cast iron borings	6.00 to 7.00
Machine shop turnings	4.00 to 5.00

Boston

BOSTON, Aug. 1.

Pig Iron.—Sales of more than 3000 tons of foreign iron, mostly Scotch, but including English, French and Belgian, are reported by brokers. They range from 100 to 700 tons each, largely the equivalent of domestic No. 2X, and for August arrival. Price details are lacking. It is reported by most brokers, however, iron has advanced, in some cases to the equivalent of $28, furnace, for No. 2X eastern Pennsylvania and $26.75 for Buffalo. In other cases foreign iron is even higher, figuring on a delivered New England consuming point basis. One eastern Pennsylvania furnace sold a limited tonnage in this territory the past week at $28, furnace base. No eastern Pennsylvania, Buffalo, Virginia or Alabama furnace is now making quotations, except on rare occasions for car lots. Resale Virginia and Alabama is to be had as well as Alabama at $30 base on cars at Providence, R. I. Inquiries for iron are more numerous than for some time and include 300 tons high silicon malleable wanted by a Massachusetts foundry; a like quantity by a Naugatuck Valley, Conn., melter; 500 tons No. 2X by a Providence, R. I., concern; and numerous car lots, mostly for prompt shipment. Lake charcoal iron has advanced $1 to $30 furnace base, and a limited tonnage sold in this territory on that basis.

We quote delivered prices, on the basis of the latest reported sales, now infrequent, and as follows, having added to furnace prices $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75	$30.15 to $30.65
East. Penn., sil. 1.75 to 2.25	29.65 to 30.15
Buffalo, sil. 2.25 to 2.75	29.91 to 30.41
Buffalo, sil. 1.75 to 2.25	29.41 to 29.91
Alabama, sil. 2.25 to 2.75	28.60 to 30.10
Alabama, sil. 1.75 to 2.25	28.10 to 29.60

Warehouse Business.—Aside from an advance of 15c. per 100 lb. in blue annealed sheets to a basis of $3.90 for No. 10, prices on warehouse products remain unchanged. An improvement in the volume of iron and steel moving out of local warehouses is reported. Business is on a larger scale than at any previous time this year, according to a majority of the distributers. Sentiment is stronger regarding bolt and nut prices, with consumption heavier than last week. Wrought steel washers are approximately 10 per cent higher because of an increasing demand and a shortage of material.

Jobbers quote: Soft steel bars, $2.75½ per 100 lb. base; flats, $3.40½; concrete bars, $2.90 to $3.03; structural steel, $2.75½ to $2.90½; tire steel, $4.15 to $4.50; open-hearth spring steel, $4.50 to $6; crucible spring steel, $11.50; steel bands, $3.90; hoop steel, $4.40; cold rolled steel, $3.50 to $4; refined iron, $2.75½; best refined iron, $4.25; Wayne iron, $5.50; Norway iron, $6 to $6.50; plates, $2.85½ to $3.04; No. 10 blue annealed sheets, $3.90 per 100 lb. base; No. 28 black sheets, $4.90; No. 28 galvanized sheets, $5.90.

Finished Iron and Steel.—McClintic-Marshall Co. will fabricate approximately 1000 tons of structural steel for the State pier, Portland, Me. The city of Boston has awarded about 150 tons of beams to the Bethlehem Steel Co. Prospective fabricating tonnages in this territory are unimportant. Some bar business was placed the past week at full prices, but a majority of the producers did not accept business. Tonnages and prices on other steel products are subjected to mill confirmation before accepted. The volume of new business booked here therefore was small. With most mills, July was a lean month so far as New England is concerned. New England wire mills are well supplied with raw material needed for their processes, and the nature of their products is such the priority order of the Interstate Commerce Commission will work comparatively little hardship.

Soil Pipe.—The demand for soil pipe continues of large proportions, and producers are well booked up to Sept. 1 or later. All sizes are in urgent request, but the call for 2, 3, 4 and 5-in., single anl double hub, is especially brisk. Prices have not changed for some time, the market remaining at 33, 10 and 5 per cent discount. Stocks in distributers or jobbers' hands are unusually small for this time of the year.

Cast Iron Pipe.—Inquiry for cast iron pipe is expanding and includes round tonnages wanted by municipalities. Producers, however, apparently are not anxious to commit themselves further except in a small way and then only for extended deliveries, inasmuch as they sold up for practically the balance of the year. The only round tonnage accepted in this territory of late is 200 tons of 6-in. pipe by the Crane Co., Chicago, for West Springfield, Mass. Bids will be opened this week on approximately 200 tons of 6 and 8-in. pipe and fittings for the Massachusetts Department of Mental Diseases. Pipe prices have been moved up $2 a ton to a basis of $57.10, delivered, Boston common points for 6-in. and larger, and $62.10 for 4-in. pipe. The usual differential of $4 is made on class A and gas pipe. The freight rate on pipe from southern points to Boston common points is $5.10, contrasted with $5.70 heretofore.

Coke.—New England producers of by-product foundry coke have advanced contract fuel $1 a ton to $16.50 delivered, where the local freight does not exceed $3.10. Both the New England Coal & Coke Co. and the Providence Gas Co. will accept no further busi-

ness during August or until the coal supply situation is clearer. This action on their part eliminates the spot market. The New England Coal & Coke Co. is operating 240 of its 400 ovens. The normal number of ovens operated at its plant is 310. Production to-day therefore is 77.41 per cent of normal.

Old Material.—Chemical borings are in demand at better than $12 shipping point. Approximately 1000 tons were bought in New England the past week for shipment outside. Mixed borings and turnings also are in demand at $9 to $9.50 on cars shipping point, fully 1000 tons having been taken on that basis since last reports. A Portland, Me., rolling mill is in the market for shafting at about $19 delivered, and some scrap rail sat $11.25 shipping point were bought for a Pennsylvania mill. A Norwood, Mass., foundry is still inquiring for stove plate at $14 delivered, but material is scarce at that figure. Car lots sold the past week at $15.50 and $16.40 delivered Cape Cod points. A sale of 100 tons of machinery cast at $18 delivered Putnam, Conn., is reported, but New England foundries in general continue to supply requirements from local yards. The old material market otherwise has been quiet. Pennsylvania mills are not interested in heavy melting steel due to the uncertainty of the fuel situation.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$19.00 to $20.00
No. 2 machinery cast	17.00 to 18.00
Stove plate	15.50 to 16.50
Railroad malleable	15.00 to 15.50
Street car wheels	18.00 to 19.00

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$11.00 to $11.50
No. 1 railroad wrought	11.50 to 12.00
No. 1 yard wrought	10.00 to 10.50
Wrought pipe (1 in. in diam., over 2 ft. long)	8.00 to 8.50
Machine shop turnings	9.00 to 9.50
Cast iron borings, rolling mill	9.50 to 10.00
Cast iron borings, chemical	12.00 to 12.50
Blast furnace borings and turnings	9.00 to 9.50
Forged scrap and bundled skeleton	8.00 to 8.50
Street car axles and shafting	14.50 to 15.00
Rails for rerolling	11.00 to 11.50

Cleveland

Further Shut-downs Imminent—Advance of $1 in Pig Iron

CLEVELAND, Aug. 1.—Although there has been no change in the number of active blast furnaces during the past week and steel capacity in operation is about the same, the industrial situation in this district is much more serious than it was a week ago, owing to the increasing difficulty in obtaining delivery of coal and coke. Blast furnaces are working on a hand-to-mouth basis and may be blown out or banked any day. The supply of coal for all steel plants is inadequate and prices very high. Some steel companies are paying $10 per ton for coal. Lake traffic is suffering on account of coal shortage and a number of vessels have been tied up, unable to fill their bunkers. The fear is that unless the coal and shopmen's strikes are settled within a week or two, many plants will be forced into idleness.

Iron Ore.—The movement of iron ore from upper Lake docks in July was somewhat disappointing. It was estimated that the shipments would amount to over 9,000,000 tons, but the strike of shopmen interfered to some extent and the total was 8,942,337 tons, which compares with 4,047,687 in July of last year. The movement to Aug. 1 was 17,293,513 tons, compared with 10,418,914 tons to Aug. 1 last year. In spite of difficulty in getting coal, the vessel owners expect to be able to handle all the furnaces can receive this month. Although 98½ per cent of the members of the International Seamen's Union voted to strike on the Great Lakes, the union officials have decided not to call a strike. Evidently they consider that this is an inopportune time to try conclusions with the vessel operators.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, $5.95; Old range non-Bessemer, 51½ per cent iron, $5.20; Mesabi Bessemer, 55 per cent iron, $5.70; Mesabi non-Bessemer, 51½ per cent iron, $5.05.

Pig Iron.—Furnaces in the Cleveland district have very little iron to sell and transactions are few. One company, which has a considerable tonnage of basic iron, is disposed to hold it for its own use. Recent pending inquiries for steel making iron, including one for 3000 tons of basic and 3000 tons of Bessemer from a West Virginia consumer, have not been placed. Another steel company is understood to be in the market for 2000 to 3000 tons of basic iron. Foundry iron prices are largely nominal, and $27, Cleveland, is probably the minimum. Sales have been made at Buffalo on a basis of $28, furnace, for No. 2 plain and $30 for No. 1 and malleable. It is doubtful whether any purchases could be made at these prices to-day.

Quotations below are f.o.b. local furnace for Northern foundry iron, not including a 50c. switching charge. Other quotations except basic and low phosphorus are delivered Cleveland, being based on a $3.02 rate from Jackson and a $6 rate from Birmingham:

Basic, Valley furnace	$26.00
Northern No. 2 fdy., sil. 1.75 to 2.25	$27.00 to 28.00
Southern fdy., sil. 1.75 to 2.25	24.50
Ohio silvery, sil. 8 per cent	33.52
Standard low phos., Valley furnace	33.00

Finished Iron and Steel.—If any sales of shapes, plates or bars are being made by Steel Corporation subsidiaries at less than 1.70c., Pittsburgh, they are very exceptional and on highly desirable business, with much uncertainty as to the time of delivery. The plate market is very strong. This is illustrated by a sale by an independent Cleveland company of 140 tons to a railroad for delivery in Chicago on a basis of 2.10c., Pittsburgh, or 2.44c., Chicago. Independents able to give prompt delivery have no difficulty in obtaining 2c. to 2.15c. on tank quality. The demand for small sizes of bars and angles is exceptionally heavy. On reinforcing bars prices range from 1.70c. to 1.80c., with the latter quotation prevailing, except on very desirable business. On cold drawn steel, delivery can be made in two to three weeks, but the companies that can give anything like early delivery on hot rolled material are few.

Warehouse Business.—Warehouse business is fairly active. Quotations remain unchanged, although on hoops and bands some warehouses are obtaining 3.50c.

Jobbers quote steel bars, 2.56c.; plates and structural shapes, 2.66c.; No. 9 galvanized wire, 3c.; No. 9 annealed wire, 2.50c.; No. 28 black sheets, 4c.; No. 28 galvanized sheets, 5c.; No. 10 blue annealed sheets, 3.50c. to 3.61c.; hoops and bands, 3.21c.; cold-rolled rounds, 3.30c.; flats, squares and hexagons, 3.80c.

Semi-Finished Steel.—The scarcity of semi-finished steel is illustrated by the fact that a leading producer of slabs quoted a customer $50 this week on an inquiry for several hundred tons. While the normal price of $35 on sheet bars, billets and slabs has not been changed, it seems probable that $40 will soon be the prevailing price.

Sheets.—Business is active and independents who are quoting 3.25c. to 3.30c. on black, 4.25c. to 4.50c. on galvanized, and 2.50c. to 2.55c. on blue annealed are several weeks behind on deliveries, although they have recently been very conservative in making promises. The demand for strip steel is extremely strong and mills are running at full capacity.

Cast Iron Pipe.—The United States Cast Iron Pipe & Foundry Co. was low bidder on 1625 tons of 24 to 60-in. cast iron pipe, and the Bowler Foundry Co. was low on 155 tons of fittings, the bids being $46.95 and $94.25, respectively. Contracts will be awarded to these companies.

Bolts, Nuts and Rivets.—Most manufacturers have more business than they can take care of comfortably and prices are strong. Bolt and nut manufacturers particularly report that business is more active than it has been at any time since the spring of 1920, and there is a likelihood of a scarcity of bolts. The $5 advance on structural and boiler rivets announced last week is being rigidly adhered to by nearly all manufacturers. There is much complaint in regard to the slow delivery of steel to bolt and nut plants. Makers of cap and set screws may announce an advance at an early date.

Coke.—The situation continues to be a source of great embarrassment to all consumers. The latest sale of Connellsville foundry coke was at $17. The outlook is that even higher prices will prevail and furnace coke is not obtainable at any price.

Old Material.—The strike situation continues to have a depressing effect on the scrap market and transactions are few. On a number of grades, prices have declined from 25c. to 50c.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel	$14.75 to $15.00
Steel rails, under 3 ft	15.25 to 15.50
Rails for rolling	15.75 to 16.25
Iron rails	14.00 to 15.00
Iron car axles	18.00 to 19.00
Low phosphorus melting	16.00 to 16.25
Cast borings	12.00 to 12.25
Machine shop turnings	11.50 to 12.00
Mixed borings and short turnings	11.75 to 12.00
Compressed steel	12.85 to 13.25
Railroad wrought	14.00 to 14.50
Railroad malleable	15.50 to 16.00
Light bundled sheet stampings	10.00 to 10.25
Steel axle turnings	13.00 to 13.50
No. 1 cast	17.00 to 17.50
No. 1 busheling	10.25 to 10.50
Drop forge flashings over 10 in.	10.25 to 10.50
Drop forge flashings under 10 in.	10.00 to 10.50
Railroad grate bars	13.75 to 14.25
Stove plate	13.75 to 14.25
Pipes and flues	10.00 to 11.00

Buffalo

BUFFALO, Aug. 1.

Pig Iron.—Two Buffalo producers have each banked one furnace and there is strong likelihood that further curtailment will develop within a few days. Rogers, Brown & Co., and the Donner Steel Co., are the two interests which have banked furnaces. Only one Buffalo producer has iron to sell—except in isolated cases where a carload is available here or there under special insistent conditions. It is hard to determine the base price of foundry iron because while iron was available, there was no difficulty in obtaining $30 for No. 2 plain foundry. Two carloads were sold by one interest—their last sale at $30 and another tonnage slightly in excess of a carload could have been sold at $30 but a sight draft transaction was not agreeable to the purchaser. Inquiry is heavy. All big buyers are in the market and it is estimated that 50,000 tons could be disposed of at the Buffalo district without difficulty if the iron was available.

We quote f.o.b. per gross ton Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sil.	$29.00
No. 2X foundry, 2.25 to 2.75 sil.	28.50
No. 2 plain, 1.75 to 2.25 sil.	28.00
Basic	25.00
Malleable	28.00
Lake Superior charcoal	31.78

Finished Iron and Steel.—The shut down of blast furnaces has further interfered with mill operation on finished material and if anything the mills are in a more precarious condition than represented last week. There is likely to be a complete shut down within a few days of several departments of leading interests here. The Lackawanna Steel Co. shut down the rail mill on July 29. The local branch of an independent is booking only black sheets at 3.15c. and withdrew on pipe within the week. With the exception of repair work, there is nothing new coming out in the structural field nor are any big operations expected in 1922. The Buffalo Steel Car Company, which has considerable car repair work contracted for, was seriously damaged by fire on July 24. The Sutherland Building Co. of St. Louis has the general contract for a new building for the Erie Malleables Co., of Erie, Pa., involving 450 tons. Morris & Allan, of Buffalo, are low bidders on the new buildings for the Erie County firm, Alden, N. Y.

Warehouse Business. — Transportation difficulties have not seriously affected delivery of warehouse material for the reason that many of the consignments are being trucked. Two warehouses are extending the radius of their trucking schedules. Inquiry is coming in from many points outside the district, indicative of the inability of warehouses in some points to furnish material. There is a healthy demand for all materials from all quarters.

We quote warehouse prices, Buffalo, as follows: Structural shapes, 2.85c.; plates, 2.85c.; soft steel bars, 2.75c.; hoops, 3.55c.; bands, 3.40c.; blue annealed sheets, No. 10 gage, 3.80c.; galvanized steel sheets, No. 28 gage, 5.60c.; black sheets, No. 28, 4.60c.; cold rolled round shafting, 3.55c.

Old Material.—There is a lively local demand for No. 1 machinery cast scrap and one large consumer has bought about 4000 tons in the last ten days. Mills are not anxious to buy steel on account of the strike and the fuel situation and dealers are finding it hard to obtain cars to ship material contracted for lately. There has been no advance in prices except a stiffening in the price of cast scrap.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel	$16.75 to $17.00
Low phos., 0.04 and under	18.00 to 19.00
No. 1 railroad wrought	16.00 to 16.50
Car wheels	17.00 to 18.00
Machine shop turnings	10.50 to 11.00
Cast iron borings	14.00 to 14.50
Heavy axle turnings	14.00 to 14.50
Grate bars	14.00 to 14.50
No. 1 busheling	15.00 to 15.50
Stove plate	15.00 to 15.50
Bundled sheet stampings	11.50 to 12.00
No. 1 machinery cast	18.50 to 19.50
Hydraulic compressed	15.00 to 15.50
Railroad malleable	17.00 to 17.50

San Francisco

SAN FRANCISCO, July 26.

Pig Iron.—Conditions on the Coast reflect the general instability at present existing, including the rate war between intercoastal operators, but these inconveniences of transportation are somewhat relieved by consumers turning their attention to foreign material, almost to the exclusion of domestic. In any case, demand during the past two weeks has not been very urgent, and the tonnage placed scarcely amounts to more than 400 tons, principally English iron, which is for the account of various foundries. The price was close to $29, ex ship. A local dealer has just been advised that a large Pacific Coast interest is inquiring in England and on the Continent for 1000 tons of 3.75 to 4.25 per cent silicon iron, but that is virtually the only indication of activity at this time.

Finished Iron and Steel.—Although the market is subject to several disrupting influences, including the strikes and the intercoastal rate war, business in most lines continues satisfactory. This is the result of the fundamental soundness of conditions on the Coast, which have been showing steady improvement since the first of the year. Building in all sections of the State is reported distinctly above the normal, and various large enterprises, such as the oil industry, display steady expansion. Bars are holding pretty closely to the 2.55c. basis, but the heavy materials range from the Steel Corporation levels to about $7 per ton higher, according to the delivery. Galvanized sheets are being quoted from 3.15c. to 3.50c., Pittsburgh; black sheets from 4.15c. to 4.50c., and blue annealed from 2.40c. to 2.75c., while plates range from 2.30c. to around 2.40c., c. and f., Pacific Coast ports. Sheets have not been quite as active recently, but plates are moving freely, one mill having taken around 1000 tons in three or four lots in the past few days, and working on an inquiry for about 400 tons. A large interest has just been awarded 375 tons of black sheets. The Los Angeles market is reported active, with several good sized prospects in sight. An oil field contract, involving 4500 tons, has just been closed. The Government is expected to ask for bids next month on four sea-going dredges, which will require around 5500 tons of plates and shapes. The local agent of a Middle West mill has just been advised of an advance of $5 a ton on large rivets.

Cast Iron Pipe.—This is a rather quiet period, with the exception of soil pipe, which is in active demand, though comparatively little new business is being accepted. Prices appear to be holding firm at recent

(*Continued on page* 320)

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Plates

Sheared, tank quality, base, per lb. .....1.70c. to 1.80c.

Structural Material

Beams, channels, etc. .....1.70c. to 1.80c.

Iron and Steel Bars

Soft steel bars, base, per lb. .....1.70c. to 1.80c.
Refined iron bars, base, per lb.....2.25c.

Hot-Rolled Flats

Hoops, base, per lb. .....2.50c. to 2.75c.
Bands, base, per lb. .....2.50c. to 2.75c.
Strips, base, per lb. .....2.50c. to 2.75c.
Cotton ties, per bundle of 45 lb.....$1.11

Cold-Finished Steels

Bars and shafting, base, per lb.....2.10c.
Strips, base, per lb. .....4.00c.

Wire Products

Nails, base, per keg $2.40
Bright plain wire, base, per 100 lb. 2.25
Annealed fence wire, base, per 100 lb. 2.25
Galvanized wire, base, per 100 lb. 2.75
Galvanized barbed, base, per 100 lb. ..... 3.05 to 3.15
Galvanized staples, base, per keg ..... 3.05 to 3.15
Painted barbed wire, base, per 100 lb. ..... 2.55 to 2.65
Polished staples, base, per keg ..... 2.55 to 2.65
Cement coated nails, base, per count keg ..... 1.90 to 2.00
Woven fence, carloads.....73 per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads, 60, 10 and 10 per cent off list
Machine bolts, small, cut threads....60 and 10 per cent off list
Machine bolts, larger and longer.....60 and 10 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads. 60 and 10 per cent off list
Cut threads .....60 per cent off list
Longer and larger sizes .....60 per cent off list
Lag bolts .....60, 10 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.:
Smaller and shorter.....50 and 10 per cent off list
Larger and longer sizes .....50 and 10 per cent off list
Hot pressed square or hex. blank nuts .....$4.50 off list
Hot pressed nuts, tapped .....$4.50 off list
C.p.c. and t. sq. or hex. nuts, blank .....$4.50 off list
C.p.c. and t. sq. or hex. nuts, tapped .....$4.50 off list
Semi-finished hex. nuts:
9/16 in. and smaller, U. S. S.....80 and 10 per cent off list
⅝ in. and larger, U. S. S...75 and 10 per cent off list
Small sizes, S. A. E. .....80, 10 and 10 per cent off list
S. A. E. ⅝ in. and larger..75 and 10 and 10 per cent off list
Stove bolts in packages .....80 and 5 per cent off list
Stove bolts in bulk .....80, 5 and 2½ per cent off list
Tire bolts .....65 per cent off list
Track bolts in carloads .....3.00c. to 3.25c. base
Track bolts, less than 200 kegs .....3.50c. to 3.75c. base

Cap and Set Screws

Milled square and hex. head cap screws, 75 and 10 per cent off list
Milled set screws.....75 per cent off list
Upset cap screws .....80 per cent off list
Upset set screws .....80 and 5 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb.....$2.65
Large boiler rivets, base, per 100 lb.....2.75
Small rivets .....70 to 70 and 5 per cent off list

Track Equipment

Spikes, 9/16 in. and larger, base, per 100 lb.....$2.25 to $2.35
Spikes, ½ in. and smaller, base, per 100 lb. .... 2.50 to 2.60
Spikes, boat and barge, base, per 100 lb..... 2.50 to 2.60
Track bolts, base, per 100 lb..... 3.25
Tie plates, per 100 lb. ..... 2.00 to 2.25
Angle bars, base, per 100 lb. 2.40

Welded Pipe

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	54½	28	¼ to ⅜.....	+ 3½	+22½
¼ to ⅜.....	60	33½	½	36½	18½
½	65	50½	¾	42½	27½
¾	69	56½	1 to 1½.....	44½	29½
1 to 3.....	71	58½			

Lap Weld

2	64	51½	2	39½	25½
2½ to 6.....	68	55½	2½ to 6.....	42½	29½
7 to 8.....	65	51½	7 to 12.....	40½	27½
9 to 12.....	64	50½			

Butt Weld, extra strong, plain ends

⅛	50½	33	¼ to ⅜.....	+ 4½	+37½
¼ to ⅜.....	56	38½	½	35½	23½
½	62	50½	¾	42½	28½
¾	67	55½	1 to 1½.....	44½	30½
1 to 1½.....	69	57½			
2 to 3.....	70	58½			

Lap Weld, extra strong, plain ends

2	62	50½	2	40½	27½
2½ to 4.....	66	54½	2½ to 4.....	43½	31½
4½ to 6.....	65	53½	4½ to 6.....	42½	30½
7 to 8.....	61	47½	7 to 8.....	35½	23½
9 to 12.....	55	41½	9 to 12	30½	18½

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 and 2½ per cent.

Boiler Tubes

Lap Welded Steel		*Charcoal Iron*	
1¾ in.	26½	1½ in.	5
2 to 2¼ in.....	41	1¾ to 1⅞ in.....	15
2½ to 3 in.....	52	2 to 2¼ in.....	25
3¼ to 13 in.....	57	2½ to 3 in.....	30
		3¼ to 4½ in.....	32

To large buyers of steel tubes a supplementary discount of 5 per cent is allowed.

Standard Commercial Seamless Boiler Tubes

Discounts on cold-drawn or hot-rolled tubes in carload lots, f.o.b. Pittsburgh, follow:

1 in.	60	2½ and 2¾ in.....	43
1¼ and 1½ in.....	52	3 in.	47
1¾ in.	36	3½ to 4 in.....	52
2 and 2¼ in.....	39	4¼ in. to 5 in.....	44

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Tin Plate

Standard cokes, per base box.....$4.75

Terne Plate

(Per package, 200-lb.)

8-lb. coating	$9.30	25-lb. coating I. C.....$14.25	
8-lb. coating I. C.....	9.60	30-lb. coating I. C.....	15.25
15-lb. coating I. C.....	11.80	35-lb. coating I. C.....	16.25
20-lb. coating I. C.....	13.00	40-lb. coating I. C.....	17.25

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....2.40c. to 2.60c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.15c. to 3.40c.

Galvanized

No. 28 (base), per lb.....4.15c. to 4.40c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.15c. to 3.40c.

Manufacturers have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic.	$0.325	Buffalo	$0.265	St. Louis	$0.43
Philadelphia, export...	0.265	Cleveland	0.215	Kansas City	0.735
Baltimore, domestic...	0.315	Cleveland, Youngstown		Kansas City (pipe)...	0.705
Baltimore, export.....	0.255	Comb.	0.19	St. Paul	0.595
New York, domestic...	0.34	Detroit	0.295	Omaha	0.735
New York, export.....	0.285	Cincinnati	0.295	Omaha (pipe)	0.705
Boston, domestic	0.365	Indianapolis	0.31	Denver	1.275
Boston, export	0.285	Chicago	0.34	Denver (pipe)	1.215

Pacific Coast	$1.50
Pac. Coast, ship plates	1.20
Birmingham	0.69
Memphis	0.385
Jacksonville, all rail..	0.50
Jacksonville, rail and water	0.415
New Orleans	0.515

The minimum carload to most of the foregoing points is 36, 000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha, and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 30c. to 40c.; ship plates, 30c. to 40c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 30c. to 40c.; sheets and tin plates, 50c.; rods, wire rope, cable and strands, 75c.; wire fencing, netting and stretcher, 50c.; pipe, not over 8 in. in diameter, 50c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

British Iron and Steel Market

American Coal Purchases Continue—America Has Bought 7,000 Tons of Rails and Is Inquiring for Tin Plate

(By Cable)

LONDON, ENGLAND, August 1.

Good quantities of British coal have been bought by America and the demand continues.

Pig iron is quiet and weaker. There have been further inquiries for 5000 tons of Scotch foundry iron to be sold for prompt delivery. The home demand is quiet. Hematite is weak and the demand sluggish. Stocks are accumulating and makers are granting concessions freely.

Coke is firmer on increased sales.

Steel prices are unchanged but the tendency is downward. It is anticipated that the home-trade price control will be dissolved before long. Australia and New Zealand are buying moderately, but other markets are quiet.

July output of the Clyde shipyards was 32,775 gross tons.

Continental material is in fair demand. India has bought sheets and plates. South America has bought merchant bars. America has secured 7000 tons of rails. Japan, China and Australia are purchasing wire meshing.

Tin plate is weak, with little business. Prompt position has sold at 19½s. ($4.33) basis, f.o.b. Sellers of September and October deliveries are asking 19¼s. ($4.27) basis, f.o.b. There is a good German demand and some works are filled up to the end of August. America is inquiring, but so far no actual orders have been placed.

Galvanized sheets are steady and business quiet. Japan is inquiring for thin-gage black sheets; also for sheets for galvanizing. India has bought a little.

We quote per gross ton, except where otherwise stated, f.o.b. maker's works, with American equivalent figured at $4.44 per £1, as follows:

Durham coke delivered	£1 6¾		$5 94
Cleveland No. 1 foundry	4 15		21.09
Cleveland No. 3 foundry	4 8 &	4 8*	19.54
Cleveland No. 4 foundry	4 7½		19.43
Cleveland No. 4 forge	4 5		18.87
Cleveland basic	4 0 &	4 0*	17.76
East Coast mixed	4 11 &	4 11*	20.20
Ferromanganese	15 0		66.60
Ferromanganese*	14 10	to 14 15	64.38 to $65.49
Rails, 60 lb. and up	7 17½	to 9 10	34.97 to 42.18
Billets	7 0	to 8 0	31.08 to 35.52
Sheet and tin plate bars, Welsh	7 7½		32.75
Tin plates, base box	0 19½	to 0 19⅝	4.33 to 4.36
			C. per Lb.
Ship Plates	9 0	to 10 0	1.78 to 1.98
Boiler plates	13 0	to 14 0	2.58 to 2.78
Tees	9 5	to 10 10	1.83 to 2.08
Channels	8 10	to 9 15	1.68 to 1.93
Beams	8 5	to 10 0	1.64 to 1.98
Round bars, ¾ to 3 in.	9 5	to 10 10	1.83 to 2.08
Galvanized sheets, 24 g.	16 0	to 16 10	3.17 to 3.26
Black sheets	12 0		2.38
Steel hoops	12 0	& 12 5*	2.38 & 2.43*
Cold rolled steel strip, 20 g.	23 2½		4.58
Cotton ties, Indian specifications	15 0		2.97

*Export price.

Continental Prices, All F. O. B. Channel Ports, Delivery as Specified

No. 3 foundry pig iron:			
Belgium, August	£4 2½s.	to £4 5s.	$18.32 to $18.87
Luxemburg, August	4 0	to 4 5	17.76 to 18.87
France, August	4 2½	to 4 5	18.52 to 18.87
Billets:			
France	5 15		25.53
Luxemburg, July	6 5		27.75
Lorraine, July	6 5		27.75
Wire nails (keg basis):			
Germany, August	0 14½		3.22
Belgium, July	0 20½		4.55
Wire rods, 5 mm. (0.2 in.):			
Belgium, July	7 5	to 10 7½	32.19 to 46.06
Angles:			
Belgium, September	7 7½		1.46
Tees:			
Belgium, July	8 5		1.64
Merchant bars:			
Belgium, October	7 12½	to 7 15	1.51 to 1.54
Luxemb'g, October	7 15		1.54
Germany, October	7 15	to 7 17½	1.54 to 1.56
France, October	7 17½	to 8 0	1.56 to 1.59
Channels:			
Belgium, July	7 10	to 7 12½	1.49 to 1.51
Joists (beams):			
France, Sept.	7 15		1.54
Belgium, Sept., Oct.	7 2½	to 7 5	1.41 to 1.44
Luxemburg, Sept.	7 2½	to 7 5	1.41 to 1.44
⅜-in. plates:			
Germany, Aug., Sept.	7 15	to 8 5	1.54 to 1.64
Belgium, Aug., Sept.	7 17½	to 8 0	1.56 to 1.59
Luxemburg and France, not offered.			
¼-in. plates:			
Germany	9 0		1.78
No. 8 gage wire:			
Belgium, July, Aug.	14 10⅝		2.88

Scrap Made of More Worth Than Salvage

The question when to scrap and when not to scrap, occurs with surprising frequency in demolition work. At times there is a very nice balance between the advantage of salvaging a piece of machinery or structural work and merely junking it. Since the development of cast iron cutting with oxy-acetylene the practice in this branch of demolition has undergone a very radical change, because it is now economical to reduce iron castings to charging box sizes in many instances where such a procedure could not have been considered even a couple of years ago. This is particularly true in the cutting up of very heavy iron castings such as are found in the mechanical equipment of power plants.

An interesting case in point is illustrated in the instance of a Chicago malting company that recently contracted with a scrap metal company to dismantle a power plant containing a large cast iron flywheel. Here the question arose as to whether it would be better to remove the flywheel in halves with a view to reassembling it as second-hand machinery, or to cut it up into such sections that it might be easily removed and broken into charging box sizes for sale as scrap. Salvaging would have required the erection of a heavy scaffold, because the roof of the power house was not strong enough to allow the removal of the halves by means of block and tackle unless some supplementary support was provided. This would probably have been the procedure before cast iron cutting with oxy-acetylene was developed, because it would have been impracticable to break up the flywheel in place.

In the case noted the cost of the scaffolding and labor for removal and salvage would have approximated so nearly the resale value of the flywheel that its reduction to scrap resulted in saving a considerable sum, even at the low price then obtaining for cast iron scrap. Eight cuts were made on the rim by means of Oxweld apparatus and one on each of the eight spokes. With the exception of the first cut on the rim, all were made by the contractor's own operator after witnessing the Oxweld service operator's demonstration.

One of the largest items of saving on the flywheel job mentioned was time, the scrapping operation being accomplished in hours against several days which would have been required to remove the parts for salvaging.

Savings Bank Deposits

Reporting savings banks in the Second Federal Reserve District, New York, show an increase of 2.5 per cent in aggregate deposits in the month ended July 10, chiefly as a result of the crediting of interest on July 1.

Deposits of reporting banks in New York City in most cases made gains slightly larger than the amounts credited as interest.

Reporting banks in other cities, however, showed in general such narrow gains as to indicate that without interest payments aggregate deposits would have declined.

NON-FERROUS METALS

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
July	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
26.....	14.00	13.75	32.12½	5.75	5.40	6.35	6.00
27.....	14.00	13.75	32.80	5.75	5.40	6.45	6.10
28.....	14.12½	13.75	32.75	5.75	5.40	6.50	6.15
29.....	14.12½	13.75	....	5.75	5.40	6.52½	6.17½
31.....	14.12½	13.75	32.62½	5.80	5.47½	6.55	6.20
Aug. 1.....	14.12½	13.75	32.75	5.80	5.47½	6.60	6.25

*Refinery quotation.

New York

NEW YORK, Aug. 1.

The price tendency is upward, and some of the markets are active. Buying of copper is fairly good with higher prices expected. The tin market is steady and only moderately active. The buying of lead has been heavy and prices slightly higher. Zinc continues its moderately rapid advance with demand good.

Copper.—Demand for electrolytic copper has been fairly good the past week, so much so that any shading of the 14c. delivered price has practically disappeared and some producers are quoting 14.12½c. There are indications that higher prices are confidently expected before the end of the week. Export business continues in sustained volume at increasing rather than diminishing prices. The fact that July has passed in the face of the coal and railroad strikes without any recession in prices is considered significant. There has also been continued depletion of stocks.

Copper Averages.—The average price of Lake copper for the month of July, based on daily quotations in THE IRON AGE, was 13.98c. The average price of electrolytic copper was 13.71c., refinery, or 13.96c. delivered.

Tin.—Moderate sales of Straits tin are reported during the past week, estimates placing the total at 500 to 700 tons, mostly future shipments, with dealers the most active participants. Considerable of the business was done below import cost, the London market being exceedingly strong. On one day 75 tons of August-September shipment from the East was sold at 32.50c., and on another day several lots of spot metal and of June-July shipment changed hands at 32.75c. The general trade is somewhat puzzled at the strength of the London market, which has advanced almost daily for the past 11 or 12 days. Quotations for to-day were £162 15s. for spot standard, £162 15s. for future standard and £163 10s. per ton for spot Straits, with heavy sales reported. Spot Straits tin to-day was quoted in the New York market at 32.75c. The monthly statistics for July are unusually interesting in that the deliveries into consumption were lower than expected, having been 4590 tons, as contrasted with estimated deliveries of at least 5500 tons. There was also an unexpected increase in stocks in store July 31, the total being 1791 tons, with the quantity landing on July 31 at 1825 tons. These figures indicate smaller consumption than expected. Imports for the first seven months of the year have been 34,895 tons, against 10,418 tons for the same seven months last year.

Lead.—A very large business has been done in this market, mostly for August delivery, and the tone is exceedingly strong. There has been no change in the quotations of the leading interest which remain at 5.55c., St. Louis, or 5.75c., New York, but the outside quotation is higher at New York, the producers asking 5.80c. Independent sellers, however, are lower than the leading interest at St. Louis, at 5.45c. to 5.50c.

Zinc.—The same factors which have prevailed for some little time continue to exert a strong influence in this market and prices continue to advance. Prime Western for early delivery is firm at 6.25c., St. Louis, or 6.60c., New York, at which levels sales were made yesterday and to-day. Brass special has sold at 6.37½c., St. Louis. The coal and railroad strikes continue to exert a deterrent influence on production, and stocks are rapidly diminishing. Information is also to the effect that stocks in England are at a low point, and the belief is strong that that country must sooner or later turn to American producers for some of their zinc requirements.

Antimony.—The market is quiet and unchanged at 5.25c. per lb. for wholesale lots for early delivery, duty paid, New York.

Aluminum.—The leading interest continues to quote 19.10c. per lb., f.o.b. producers' plant, for virgin metal, 98 to 99 per cent pure. Imported aluminum from dealers is offered at 17.75c. to 18c. for the same grade, New York, duty paid.

Old Metals.—Business was a little better this week as a result of a firmer market. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	13.50
Copper, heavy and wire	12.75
Copper, light and bottoms	11.00
Heavy machine composition	10.50
Brass, heavy	8.00
Brass, light	6.50
No. 1 red brass or composition turnings	8.75
No. 1 yellow rod brass turnings	7.50
Lead, heavy	5.00
Lead, tea	4.00
Zinc	3.75

Chicago

Aug. 1.—Copper, tin, lead and zinc have advanced. Outside of copper there is an absence of endeavor to sell which has tended to strengthen the market. Tin has also been influenced by a strong bull movement in the London market. Sellers of spelter are confident because they feel that, though prices have advanced, idle smelters will not be able to resume operation on account of the pinch of the coal strike. Lead alone is in active demand after a quiet period. Some of the old metal grades have advanced in sympathy with the new metals. We quote, in carload lots, lake copper, 14.25c.; tin, 33.50c. to 34c.; lead, 5.50c.; spelter, 6.30c.; antimony, 7c.; in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 10.75c.; copper bottoms, 9c.; red brass, 8.75c.; yellow brass, 6.75c.; lead pipe, 4.50c.; zinc, 3.25c.; pewter, No. 1, 20c.; tin foil, 22.50c.; block tin, 26c., all buying prices for less than carload lots.

Expansion of Air Reduction Sales Co.

The Air Reduction Sales Co., Inc., has purchased plant sites and has begun the erection of additional plants. These include an Airco acetylene plant at Birmingham, an oxygen plant at Milwaukee, and an acetylene plant and a calorene plant at Pittsburgh, the last two augmenting a recently completed oxygen plant in the same city. Construction of the plant at Birmingham already has been begun. Facilities for producing oxygen from the air will also be enlarged in Buffalo and Minneapolis.

The completion of the new construction will bring the total number of the company's oxygen plants throughout the country up to 20, the acetylene plants to 11, and the calorene plants to 2. These are in addition to the air reduction apparatus plant in Jersey City, N. J., the recently acquired Davis-Bournonville apparatus plant, also in Jersey City, and the Ivanhoe, Va., plant of the National Carbide Corporation.

The drawing room practice of the Taft Peirce Mfg. Co., Woonsocket, R. I., calls for bond paper for, say, tool drawings. The paper is purchased cut to size with the title blanks and border lines printed. Drawings are made in pencil, using ink only on the outline of the work and for the center lines, dimensions and notes. Blueprints are provided for the use of the shop and the original drawing kept in the files.

PERSONAL

A. F. Knoblock has resigned as vice-president and works manager of the Cleveland Tractor Co., Cleveland, and his brother, H. Knoblock, has resigned as superintendent of that company. They plan to establish plants in Detroit, Cleveland, and other cities for the manufacture of transmission and timing gears for automobiles.

JOHN A. CAMM

John A. Camm, for several years the sales manager of Kearney & Trecker Corporation, manufacturer of milling machines, Milwaukee, became on Aug. 1 president of the Western Iron Stores Co., Milwaukee, dealer in machinery supplies. Mr. Camm has been associated with Kearney & Trecker for a considerable number of years, entering into the employ of that company in 1908 as superintendent. His experience in the sale and manufacture of machine tools dates from 1900, and previous to his connection with the Kearney & Trecker Corporation, he was general foreman of the Boye & Emmes Co., and previously foreman with other Cincinnati machine tool builders, among them being American Tool Works Co., R. K. LeBlond Machine Tool Co., and the Cincinnati Planer Co. In making his new connection Mr. Camm does not disassociate himself from the machine tool business, as he will continue to act in an advisory capacity for Kearney & Trecker Corporation.

E. R. Wiggins, formerly with the Chilton Co., Philadelphia, as technical editor of the Chilton *Tractor Journal*, has joined the sales department of the Holt Mfg. Co., Peoria, Ill., to do special work as sales engineer. He was formerly with the J. I. Case Threshing Machine Co., Racine, Wis.; Aultman & Taylor Machinery Co., Mansfield, Ohio; and Deere & Co., Moline, Ill., in their various engineering and experimental departments on tractor development.

W. L. Walker, formerly chief engineer of the Indianapolis Switch & Frog Co., Springfield, Ohio, and for the past four years assistant plant manager of the Ajax Forge Co., Chicago, has been appointed superintendent of the switch and frog department of the Buda Co., Harvey, Ill.

Bertram H. Lawrence, district engineer American Steel & Wire Co., Worcester, Mass., has been made chief engineer to succeed W. E. Snyder, Pittsburgh, who recently died. Matthew R. Fish, chief draughtsman, South Works, Worcester, succeeds Mr. Lawrence as district engineer. Mr. Lawrence will have charge of power and mechanical equipment, with headquarters at Pittsburgh, and will take up his duties this month. He originally was with the Chicago office of the company, and went to Worcester about seven years ago. His education as a mechanical engineer was received at the University of North Carolina.

Col. E. H. Havens has been made vice-president and general manager of the Locomobile Co. of America, Bridgeport, Conn. He was one of the receivers of the old Locomobile company prior to its being acquired by the Durant interests.

Joseph H. Swift, master mechanic, South Works, American Steel & Wire Co., Worcester, Mass., has been made chief draughtsman, to succeed Matthew R. Fish, who is now district engineer. Joseph Ashworth, shop foreman at the North Works succeeds Mr. Swift as master mechanic at the South Works.

W. S. Silpath, who has been made general manager of the Hub Wire Cloth & Wire Works Co., Boston, has been identified with the wire business 25 years, six years with the Buffalo Wire Works Co., Inc., the item regarding him in THE IRON AGE of July 27 being inaccurate.

C. A. Hintz has resigned his position with the Crucible Steel Co. of America to become Milwaukee manager of the Ziv Steel & Wire Co., Chicago, with offices at 201 University Building, Milwaukee.

E. W. Schultz, Sheboygan, Wis., president State Board of Vocational Education, and R. L. Cooley, director Central Continuation School, Milwaukee, will leave Aug. 15 for Europe to make a study of industrial training schools in England, France, Germany, Switzerland and Denmark.

Joseph G. Lawler, formerly sales manager of Louis Schlesinger, Inc., is now associated with the Van Wagoner-Linn Construction Co., New York, contracting electrical engineers.

Joseph Dhavernas, president United States Nickel Co., New Brunswick, N. J., has returned from an extended visit to Europe, having made an investigation of the business conditions with respect to nickel and its future.

Monroe L. Patzig, 206 Eleventh Street, Des Moines, Iowa, has been appointed representative of the Conveyors Corporation of America, Chicago, for the sale of the American trolley carrier. His territory lies in central Iowa.

A. L. Roberts, formerly master mechanic of the Lehigh Valley Railroad, and recently chief engineer of the Atlas Crucible Steel Co., has been appointed sales engineer, railroad department of the United Alloy Steel Corporation, Canton, Ohio.

A. M. Lindsley, chief engineer, Alvord Reamer & Tool Co., Millersburg, Pa., has been placed in charge of the advertising department of that company. He will continue his duties as chief engineer. Mr. Lindsley was formerly connected with the Cincinnati Milling Machine Co., Cincinnati.

S. P. Ker, Jr., Sharon, Pa., has been appointed general manager of sales of the Ashtabula Steel Co., Ashtabula, Ohio. The company is completing an eight-mill sheet plant, and expects to begin rolling in August. Mr. Ker is a son of Severn P. Ker, president of the Sharon Steel Hoop Co.

S. G. Gilfillan, president of the Belfont Iron Works Co., Ironton, Ohio, resigned at a recent meeting of the board of directors, and was made chairman of the board. He has been vice-president of the company for several years and has been a notable figure in the Hanging Rock iron district. C. Peebles, for many years managing head of the Ashland Steel Co., Ashland, Ky., which was recently taken over by the American Rolling Mill Co., has been elected to succeed Mr. Gilfillan as president of the company.

W. C. Durant has become identified with the Locomobile Co. of America as its active head. A 350 per cent advance in the price of Locomobile shares marked the arrival of this announcement on Wall Street.

Elbert H. Gary has accepted the chairmanship of the public safety committee of the Safety Institute of America, which with the help of 87 leaders in civic, industrial, social, educational and administrative circles, is to conduct an intensive public safety campaign. Judge Gary is generally credited with believing that the safety methods employed by the United States Steel Corporation, which it is estimated has saved 30,000 employees from serious injury in 14 years, could be adopted in large cities.

Dr. Colin G. Fink, consulting electrometallurgist, has been put in charge of the division of electrochemistry, department of chemical engineering, Columbia University, New York. He will continue his services as secretary of the American Electrochemical Society, office facilities having been arranged at Columbia for this purpose. The society's offices at Lehigh University will be discontinued after Aug. 1.

FRENCH PRICES UNEVEN

Market Slightly Unsettled—Export Activity—Pig Iron Weak—Less British Competition

(By Special Correspondence)

PARIS, FRANCE, July 20.—The French iron and steel market is in much the same situation as last week; quiet for inland sales, which is natural during the holiday season, but, notwithstanding the fall of the German mark, more active for export. Prices are well maintained in some items, show a sagging tendency in others and are on the whole rather unsettled.

The adjusted price of German coke delivered to French blast furnaces through the pooling agency of the Société des Cokes de Hauts-Fourneaux, has been raised from its present level of 93 fr. at Franco-German frontier to 97 fr. for August delivery. On the other hand, Germany is asking the Reparations Commission for a reduction of her present coal and coke deliveries to France. Lorraine iron works are, of course, normally depending upon German coke from the Ruhr for their supply, and if the German request were granted, they would have to procure French, Belgian or British coke at a much higher delivered price. Negotiations are now on between French and British companies for an exchange of British metallurgical coke for French iron ore, via French northern ports.

All this adds a regrettable element of uncertainty to the unfavorable conditions that the French iron and steel industry is laboring under: rising costs and falling prices. A substantial increase of production could alone improve this situation, but world economic conditions are, thus far, against it.

Of the 222 French blast furnaces, in May, 93 were in operation; 61 were under repair or in course of construction, and 68 were inactive.

Iron Ore.—Latest prices of French Eastern iron ore are as follows (per ton, at mine):

Mining centers:	Fr.
Thionville (32 per cent)	11 to 50
Briey	14 to 15
Longwy	9.50 to 14

Pig Iron.—Prices of foundry pig iron are still sagging, because of keen competition among producers. The current price for chill-cast pig iron No. 3 P. L. is 210 fr., but some orders were booked at 208 fr. and even 205 fr. If this price is contrasted with the price paid for coke by French Eastern iron works (97 fr. next month, which is equivalent to an average delivered price of 100 fr.), it will be readily seen that, at such a level, producers are undoubtedly losing money. One Lorraine producer is upholding the price of 215 to 220 fr., and another one (the Redange works, has decided to blow in its one blast furnace. Middlesbrough foundry iron No. 3 is now quoted 308 fr. f.o.t. Calais or Rouen.

Owing to the recent rise of British currency (which has now partly receded), the market for French hematite has lately been rather satisfactory, and a postponement of the application of the new import duty, 37.50 fr. per ton instead of 30 fr., was even contemplated. British East Coast hematite, mixed numbers, is worth now 91s. f.o.b., which is equivalent, with a 6s. freight rate and at the present rate of exchange, of 52.5 fr. to £1, to 254.6 fr. plus 30 fr. per ton of import duty and unloading expenses. The present prices of French hematite are as follows: In the zone of penetration of British hematite (Northwestern coast area), 295 to 305 fr.; in the Eastern area, 305 to 315 fr.; in the Center and Paris areas, 325 to 330 fr.

Semi-Finished Steel.—Although quieter, the market for semi-finished products is good, especially for export, and if fewer orders were lately booked from Germany, a few orders, on the other hand, were placed in Great Britain. Present inland prices average 290 fr. for ingots and 310 fr. for blooms, at Lorraine works.

Beams.—The Comptoir Sidérurgique bookings for beams during the month of June totaled close to 35,000 tons.

Rails.—The large orders for rails which were contemplated for some time by the French railroads have just been virtually awarded to the Comptoir Sidérurgique, the domestic selling association of French producers of rails and beams.

Sheets and Plates.—The situation of the sheet market is satisfactory. The British product is now out of competition and Belgian sheets are selling only in the frontier area. Orders booked by the French Comptoir des Tôles, which have been steadily increasing since April, show higher figures still for the first part of July.

Rolled Merchant Iron.—Less activity has caused a prolonged weakness of prices, which vary considerably according to specifications, time of delivery, etc. For instance, one Lorraine works has booked an order for 1000 tons at 425 fr., while another producer has accepted 407 fr. for a similar tonnage. For export, 410 to 415 fr. f.o.b. Antwerp was recently accepted. Delivery on medium and small shapes varies now from two to three months. Steel wire is now quoted at 450 to 470 fr. at Lorraine works. There is continued improvement in sales of castings.

Western Iron Stores Co. Expansion

In connection with the election of John A. Camm to the presidency of the Western Iron Stores Co., 145-147 West Forty-seventh Street, Milwaukee, as referred to elsewhere in this issue, it is stated that the company will gradually enlarge its machine tool department and will deal extensively in metal-working equipment, production tools, etc. It has dealt in machine tools in a limited way for several years in connection with its business as a jobber and dealer in foundry and machine shop equipment and supplies, transmission appliances, fixtures, etc.

Shipping Board Sale of Engines

WASHINGTON, Aug. 1.—The United States Shipping Board has sold 102 triple expansion marine engines at public auction for $155,850. They were bid in by dealers in scrap metal and others, as follows: Big Four Machinery & Salvage Co., Chicago; Guy Mason, Washington; Stock Yards Scrap Iron & Metal Co., Chicago; Federal Shipbuilding Co., New York; David Dick, Welland, Ont.; Henry A. Hitners Sons Co., Philadelphia; Kennecott Copper Co., New York; S. D. Ostrow, Erie, Pa.; John W. Sullivan, New York, and Daniel Kern, Portland, Ore.

OBITUARY

CROWTHER TEAL, part owner and manager of the Rochester Barrel Machinery Co., Rochester, N. Y., died at his home Friday, July 21, after a brief illness which resulted from heart attack. He had been connected with the manufacture of barrel machinery since he came to this country from England 38 years ago.

SAMUEL H. CARPENTER, president and one of the directors of the Atlas Drop Forge Co., Lansing, Mich., died suddenly at his home July 26. He had been at the head of the Atlas company since it began in 1906.

HARRY I. WOOD, president Harry I. Wood Electric Co., Louisville, Ky., for 22 years, died July 25.

EDWARD LACEY BRAYTON, president of the Pelton Water Wheel Co., San Francisco, died July 21, at Piedmont, Cal. Mr. Brayton had much to do with the development of California water power.

D. D. ELLIOTT, general superintendent Joseph E. Thropp Co., Earlston, Pa., died at his home Monday morning, July 24. Starting with the Shwenberger Steel Corporation, then successively with the American Steel & Wire Co. at Cleveland, the Donora furnaces of the Steel Corporation, the Cambria Steel Co., Johnstown, Pa., then with the Joseph E. Thropp Co., Mr. Elliott has been connected with the iron and steel industry of this country for many years.

IRON AND STEEL MARKETS

(*Continued from page* 314)

levels, that is, $50 for 6-in. and $54 for 4-in., delivered. Perhaps the best offering at present is that involving 1270 tons of 20-in. pipe for Seattle, the award on which is expected at the end of the current week. Deliveries are growing daily more difficult, and, under conditions, are very uncertain. Some mills are urging consumers to anticipate their spring needs at this time when demand is lighter.

Coke.—The best business of recent date involves the 1000 tons of coke on which several dealers and importers have been working. Keen competition brought out a low bid, around $15, c.i.f., but agents have just received advices from Europe indicating an advance of $3 per ton, which makes the market price about $17.50. The strikes have curtailed business in domestic coke to a marked extent, and buyers are showing more interest in foreign material. It is estimated that around 2000 tons have been sold for late August arrival at close to $17.50, ex ship, to the foundry trade in carload quantities, for the most part.

Old Material.—A fairly steady business continues in scrap, but it is not of great proportions at present. The Southern Pacific Company is still offering freely, and absorption is progressing slowly. Market prices rule steady at $10, or a little better, on heavy melting, per gross ton, delivered at consumers' plants, and firm at $22 on cast iron scrap, per net ton.

Youngstown

YOUNGSTOWN, OHIO, Aug. 1.—Differing opinions prevail with respect to effect of the coal priority orders of the Interstate Commerce Commission. One group inclines to the belief that little coal will be available for industrial consumption, at least for duration of the coal miners' strike. Another group believes that the Government will seek to avert serious unemployment by giving industries enough fuel for at least partial operations.

Independents are hopeful that the priority order may start shipments held up on Southern carriers moving and that coal loaded prior to the order will not be diverted. Lack of motive power, however, is declared to be the principal deterrent toward the relief of congestion on roads tapping the Southern mining regions, from which coal for Youngstown and Pittsburgh district industries has moved in heavy tonnages since the middle of April.

In a general way, producers are largely out of the market. Efforts are being concentrated to meet obligations of regular customers, and mills are falling behind in this respect. One interest reports that it occasionally has some tonnage that can be sold when an order fits in with rolling schedules, but not otherwise.

Just how long non-integrated sheet rollers will be able to maintain schedules is a question, in view of the fact that they must purchase their sheet bar requirements on the market, and that such makers appear to be especially hard hit by the disorganization to transportation. First evidences of curtailment in semi-finished production appear this week, aside from the suspension July 15 of the Bessemer department of the Republic Iron & Steel Co. On slabs, billets and sheet bars, $35 is the ruling third quarter quotation.

Larger interests have as yet shown little disposition to mark up quotations, though advances above the nominal market ranging from $3 to $5 per ton have applied on sheets, strips and merchant steel bars. Not all independents have abandoned the quotations of the leading interest on the three grades of sheets, but little new business is being considered.

Producers, however, point out they cannot be expected to maintain current quotations based upon coal costs ranging from $2.50 to $3.50 per ton, when their fuel costs have jumped to $8 and $9 for new supplies. As yet comparatively little of this high-priced coal has entered into actual production costs, because of unwillingness of industrial buyers to pay these figures and inability of the roads to make deliveries. One interest in the district was recently asked $9.50 per ton for upward of 100 carloads of Kentucky coal, which would have cost $11.90 delivered. Some companies are buying steam coal in a small way to keep their boilers operating when their own reserves are exhausted.

In the Youngstown district, the Carnegie Steel Co. has been in more favorable operating position, from the standpoint of fuel supplies, than the independents. Its Ohio Works blast furnaces have received considerable coke from Lorain, enabling it to continue five of six stacks in operation. The Charleroi, Pa., plant of the Electric Alloy Steel Co. is operating on a normal basis. The company is receiving a large number of small orders, states an official, which necessitates frequent changing of the rolls and thus adds to the costs. Combination of the company with the Atlas Crucible Steel Co., Dunkirk, N. Y., as proposed, will give the merged interests five finishing mills, as compared with two now operated at Charleroi, one of which is also used for blooming mill purposes.

Local Strike Developments

Belief prevails in traffic and industrial circles that the strike of railway shopmen will gradually wear itself out and that the men will drift back to work. In many cases shopmen have gone from one district and have accepted employment in another in the shops of another carrier; in others, shopmen who walked out willingly or unwillingly have left their own communities and accepted employment in shops in other districts operated by their employer.

In many cases skilled workmen have gone with equipment interests working on contracts for the carrier whose service the employee left. Railroads are concentrating their active forces on locomotive repairs, but the inadequacy of such work is evidenced by inability to handle heavy freight movements in normal volume. Less attention is being paid to car repairs.

In this district the railroads took immediate steps to prevent disorder, securing injunctions in federal court restraining striking employees from trespassing on the company's property or molesting or interfering with men who took their places. These writs of injunction were personally served on many of the striking shopmen, and as a result there has been comparatively little disturbance.

Two men have been arrested at New Castle charged with sabotage, but disorder has been of negligible proportions in this territory. As yet there has been little interference with outbound shipments of steel products. The Baltimore & Ohio railroad appears to be the most seriously affected of any of the trunk line carriers, in so far as its operations throughout this territory are concerned.

Wire Saws for Marble Cutting

The use of wire for cutting slate and marble was recently discussed in *The Quarry and Surveyors' and Contractors' Journal.* The wire travels at about 12 miles per hour. It is made in lengths of from 220 to 880 yd., sometimes more, and in three diameters, 4 mm., 5 mm. and 6 mm., the lighter-gage wire being employed for yard sawing and the heavier for quarry work.

In a large working the cutting wire is sometimes driven by a pulley fixed on a countershaft which may drive one or more lines of cutting wire each with its own friction clutch so that each can be worked independently of the other.

The wire saw is referred to as a useful and economical machine, being cheap to operate, requiring little horsepower, and only occasional attention to see that sand and water are kept fed into the cut. They have been developed primarily for marble working, but can be easily adapted to slate cutting.

Attempts to use them for sandstone cutting did not apparently turn out well, because of the excessive wear on the wire. The original article describes the details of their installation.

Railroad Steel Castings

(*Continued from page 284*)

13. In case of small orders for bolsters, truck sides, draft arms, yokes or castings weighing over 150 lb. where the size of the order and the available pattern and foundry equipment are such that not more than five castings can be cast in any one melt, the physical properties, as required in Section 8, will be determined from an extra or spare test coupon cast with and attached to some other casting of the same melt.

14. In the case of orders including only castings not exceeding 150 lb. in weight, a test to destruction of one casting from each 100 castings or smaller lot may be substituted for the tension tests, at the option of the inspector. This test shall show the material to be ductile, free from injurious defects and suitable for the purpose intended.

Workmanship and Finish

15. The castings shall substantially conform to the sizes and shapes shown on the purchaser's drawings, and shall be made in a workmanlike manner.

16. (*a*) The castings shall be free from injurious defects.

(*b*) Minor defects which do not impair the strength of the castings may, with the approval of the inspector, be welded by an approved process. The defects shall first be cleaned out to solid metal; and, after welding, the castings shall be annealed, if required by the inspector.

Marking

17. The manufacturer's name or indentification mark and the specified pattern number shall be cast on all castings. In addition, the month and year when made shall be cast on all bolsters, truck sides, frames, wheel centers, cylinders, and similar castings. The location and size of numbers shall be agreed upon by the manufacturer and the inspector. In accordance with the standard practice of the individual foundry to identify individual castings, a serial number may be cast or the melt number may be stamped on bolsters, truck sides, frames, wheel centers, cylinders and similiar castings as agreed upon by the manufacturer and the inspector. The melt number shall be legibly stamped on all other castings weighing over 150 lb.

Inspection and Rejection

18. The inspector representing the purchaser shall have free entry, at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of castings ordered. The manufacturer shall afford the inspector without charge, all reasonable facilities to satisfy him that the castings are being furnished in accordance with these specifications. All tests (except check analyses) and inspection shall be made at the place of manufacture prior to shipment, unless otherwise specified, and shall be so conducted as not to interfere unnecessarily with the operation of the works.

19. (*a*) Unless otherwise specified, any rejection based on tests made in accordance with Section 7 shall be reported within five working days from the receipt of samples.

(*b*) Castings which show injurious defects subsequent to their acceptance at the manufacturer's works will be rejected and the manufacturer shall be notified.

20. Samples tested in accordance with Section 7, which represent rejected castings, shall be preserved for two weeks from the date of the test report. In case of dissatisfaction with the results of the tests, the manufacturer may make claim for a rehearing within that time.

JUNE SHEET STATISTICS

Unfilled Orders Mount When Production Falls Behind New Sales

Sheet sales for the month of June, as disclosed by the monthly report of the National Association of Sheet and Tin Plate Manufacturers to the Department of Commerce, gained substantially over those for May, amounting to 268,032 net tons as compared with 176,200 tons for the previous month. Production for June was 210,460 tons, or 57,572 tons less than the sales, while shipments were 203,023 tons or 65,009 tons less than the sales. Unfilled tonnage as of July 1, was 437,853 tons, an increase of 73,778 tons over the June 1, total. Finished stock on hand awaiting shipment as of July 1, was 77,251 tons as compared with 72,676 tons a month before and unsold stocks amounted to 21,609 tons as against 22,177 tons on June 1.

The total number of hot mills in the United States is 641, having a monthly capacity of 365,000 tons and the percentage of the capacity to which the figures are related is 67 per cent. June sales were 110 per cent of such capacity; production 86.4 per cent; shipments 83.3 per cent; unfilled orders 179.7 per cent; stocks awaiting shipment 31.7 per cent and unsold stocks 8.8 per cent.

The unfilled tonnage figures indicated obligations of the mills, upon whose reports the figures are based, as equal to about 1.8 months' capacity production, but if the unshipped and unsold stocks amounting to 98,860 tons are deducted, the net obligations of these mills drop to 338,993 tons, equal to about 1.72 months' capacity production. Capacity production is out of the question under existing coal, transportation and labor conditions, and based on the June production rate the unfilled orders constitute well over two months' output.

Last Week's Coal Production

WASHINGTON, Aug. 1.—Whether it was only a coincidence or an immediate result, figures of the Geological Survey show that there was an increase of approximately 200,000 tons in the coal in the seventeenth week (July 24-29) of the strike which followed the invitation of the President to reopen the mines. The survey says that production that week ran at the rate of 3,900,000 tons as compared with 3,700,000 tons for the preceding week.

Production of anthracite coal remains practically zero. The increase in output of bituminous coal is attributed partly to more men at work in Pennsylvania, partly to improved car supply in Southern West Virginia, and partly to heavier shipments from Alabama. There was no indication of increased production in response to the invitation to reopen mines in any of the strongly organized districts. More coal is coming out of the former non-union fields of Pennsylvania, and a little more from the Fairmont and Kanawha districts of West Virginia, but the additional supply from these sources was not yet significant in comparison with the requirements of the country.

Loadings on Monday, July 24, totaled 13,083 cars, or 417 above the preceding Monday, but 3664 cars below the last Monday before the shopmen's strike. Loadings on Tuesday, July 25, were 11,861, on Wednesday, 11,383, and on Thursday, 11,760.

Plant Operations in the Youngstown District

Extensions now being made to the plant of the Youngstown Boiler & Tank Co., Youngstown, Ohio, will be completed in August, according to President James P. Keene. An addition is being built to the main plant building, substantially increasing productive capacity. The company now has orders sufficient for four months' operations, and output will be increased immediately upon completion of the additional capacity. The company manufactures storage tanks in standard sizes, and is engaged in miscellaneous steel plate construction. It consumes annually about 25,000 tons of plates. Two new buildings, of steel construction, are being added, one 100 x 160 ft. and the other 30 x 120 ft.

Wage Advance at Cambria Works

An advance in wages was made by the Midvale Steel & Ordnance Co. at its Cambria plants at Johnstown, Pa., effective Aug. 1. Common labor, which had been at 25 cents per hour, was advanced to 28½ cents per hour. At the Central Western plants of the Steel Corporation and of some other producers the basis for common labor has been for some time 30 cents per hour.

The Branford Brass Foundry Co., Inc., Branford, Conn., has completed its foundry and is ready to begin manufacturing in brass, aluminum and alloyed castings.

UTILIZING THE SELLER

Making the Manufacturer Prove His Goods—Inspection and Tests

BY JOHN J. RALPH

HAVING specialized in his line and made his living from it, the seller may be assumed to have a good knowledge of it. He knows the trade customs, the history of the product, what the general trend is along which advancement may be expected to come, and how and where it is usually used.

In the matter of grades he has definite information which the purchaser often has not. At times, cheaper grades may be used to better advantage than the expensive ones. At other times a few cents more spent for quality will cut the consumption materially.

An instance in which this is particularly true is in the paper line. Few have any real knowledge of the different kinds of paper and the grades, yet every concern in the country must buy paper and it should be exactly adapted to their needs. Here the seller must be relied upon.

The producer is usually in touch with alternative products. Jobbers are perfectly willing to quote on these and, if they can in any way be used, it will pay to get further information. These competitive lines mean much to the buyer and it pays to keep in touch with their development. For instance, in the electrical line, there is the development during the past ten years of synthetic rosin for insulating.

As the manufacturer has usually made careful studies of the possible developments and adaptation of his products, he stands ready to give this information. He comes into contact with many other users of his material and has been called in many times to tell why it did not give satisfactory results, or how the manufacturing treatment could be changed to attain the desired product. This has given him a training in the handling and overcoming of difficulties connected with it.

This information is of particular value in advance of the time of designing the product and settling the methods of manufacture. If work has reached that stage, it is necessary to struggle with the difficulties, but if they can be avoided in the design of product and equipment of shop, there will be a gratifying lack of trouble and a noticeable saving.

Information as to the probable trend of the market price and the probabilities of plentiful or restricted supply can best be obtained from the maker. The source may perhaps be tainted, for the interests of both parties are not exactly the same, but usually it is as unbiased as possible, for salesmen, if not sellers, have come to realize that only through strict honesty can they retain the respect of customers.

The delivery situation is often of much importance. After the experience of the past few years this has probably not been forgotten. Very often it is not realized that some goods, if not in stock, cannot be made up for some time. This is particularly the case where they are made on large machines, which must be specially set up for each particular size and kind of goods going through, and where the machine is used to turn out a whole line of goods, as is the case with rolled goods, and particularly in the steel mill.

Co-operation

This is usually desired by the seller. Often the buyer does not care for it, not wishing to put himself under obligations, and partly because he does not wish the details of his business generally known. In some cases there is a disposition to recommend courses which would practically compel the buyer to continue buying the same kind of goods. At times there is great rivalry to have certain goods declared standard, as in architects' or government specifications.

This is usually considered to be legitimate business, but if there is realization that each knows his business and that the buyer is not willing to have all of his engineering and design work done for him, the attitude changes and there is a sincere desire to assist in obtaining the very best possible result in meeting the real needs.

The first contact is with the salesman and the sales organization. Their special duty is to sell the goods—the knowledge and design services are purely incidental. For this reason the sales department is filled with salesmen and the real engineer is somewhat of a novelty. There is a feeling that a man who knows his subject thoroughly and is a real expert is ordinarily a poor salesman.

Particularly with the larger concerns is it unusual to find men who are experts in the particular line in which one is interested. These men have to sell too many kinds of things in too many kinds of places to know their subject well. This is also true of jobbers' representatives.

It is then necessary to get all the information that the salesman has. This can usually best be done by calling in the man or men in the plant who are particularly interested in the product. It will probably not be long before the salesman is reduced to referring to "our factory man." If the best results are to be obtained, here is where care is to be used.

If the project does not warrant bringing on the factory representative or expert in person, it must be so put that he can obtain a particularly clear idea of just what is wanted. This is not easy. There are difficulties in just the pure use of words. Each trade and profession has particular meanings for even common words, which may easily cause difficulty.

Not every man has the ability to use the English language so that but one meaning can be read from what he has written. There are still less who can present a complete picture of any proposition. Much can be done with care and the use of such assistance as sketches, specifications, etc.

Reaction on the Buyer's Organization

This information, gathered from perhaps a half dozen sources, and representing the very best of modern practice, is of supreme importance to the various departments of the buyer.

In the field of design it is necessary for the designer and the production department, and that they shall work together in co-operation to make the best use of it. Their aim is (first) to get out the most saleable product and (second) to make it as economically as is possible under the conditions.

This sounds elementary, but it is far from being a usual condition. In fact, it is novel to find a concern which makes provision for the general and systematic reception and use of information. In some of the smaller concerns it is possible to get right to the men who are responsible for the work, and they will gladly take it, in a verbal form, mainly, it is true, but it makes far more impression on them, for they are alert to find that which they may use.

Discounting Seller's Information

No matter where information comes from, it must be carefully tested and checked to find (first) its accuracy and (second) its bearing on the problem in hand.

The salesman is usually a very optimistic individual. Accustomed to have his statements discounted, he embroiders them so that the final effect will be substantially accurate. He suffers from the feeling that the final responsibility is the buyer's and that his job is to get rid of the goods. It is, therefore, necessary to examine his information closely for absolute misstatements, for exaggerations and for mistakes. It is not unusual for the purchasing agent to obtain inaccurate impressions through his lack of exact familiarity with the goods. By focusing on this information the intelligence of the part of the organization involved, it is usually possible to get the facts and discover their bearing under the conditions considered.

There are methods of checking up that have not been used to the extent that they might be. Each of them is standard procedure in certain lines. The first is the systematic study of machines and materials in

other factories. It is seldom that other manufacturers, even competitors, will fail to give permission to study either machines or materials in their plants. Such a request is usually taken as a compliment. This gives one a chance to obtain an unbiased opinion and to find out the opinions of others. It is not, however, sufficient.

Our reputation as manufacturers of automotive equipment has gone out to the ends of the world. We have had visitors from all over the world who have carefully and closely checked the work in our various factories. These are very suave gentlemen and never fail to leave a plant without mentioning how efficient it is. They also never tell what they have seen that does not seem to them to be the best of practice. They would not be so presumptuous, and they have no wish to hurt anybody's feelings.

The standing wonder of all of these gentlemen is how, with access to no plants barred, two plants in the same city can each have crude processes in certain departments, while some other plant practically next door has worked out extremely efficient and economical methods of machining. To them it seems common sense for each to exchange their advanced ideas and both profit from the exchange.

Experts

Large companies have on their staffs men who are experts in their special lines to whom such problems as may come up are referred. While these men work with the regular staff, they bring to the study special training and experience which is of great assistance. This is impossible to the small plant and they therefore work along without it, because they cannot afford to hire a whole line of experts.

There has developed during the past few years a body of men in independent practice who are experts in certain branches. But there is often a feeling that to call on them is an indictment of the staff. This is, of course, erroneous, for many things come up with every company which must be solved in a "rule of thumb" manner, or by the "cut and try" method, which, if turned over to a real expert, could be solved in the unusual manner that means profits.

Testing

A fairly certain way, and one which must always be used eventually, is to test. It gives invaluable information which sometimes can be obtained in no other way. Large plants in highly technical lines have fully equipped testing departments through which it is possible to run tests which give absolute information on the machine or material under consideration. In others it is necessary to go to outside commercial laboratories.

These latter have not been used as much as they should be. Company after company is still working on "rule of thumb," where they should know exactly "where they are at." Many a company is still taking the sellers' word for the material he ships when, for a few dollars a month, it could have tests made which would give all of the characteristics of the material received. This would enable the company to plan intelligently to use it to the best advantage.

There is an interesting tendency to place development problems in the various engineering college laboratories. In these places there is often the best of talent, with an abundance of observing assistance from students. Their equipment in testing machinery is usually far more complete and of greater capacity than in the usual plant laboratory.

If the precaution is taken of stating the problem with exactness, supplying sufficient money so that the necessary work can be done, and starting the experiments in sufficient time, this is a very satisfactory method.

The producer's plant offers facilities, both in the way of talent and equipment, which sometimes is the only practical solution. This is particularly true of special machinery or products which it may not be possible to duplicate in any other place in the country. Because of their familiarity with the material, and other investigations they may have carried out in some lines, this is often the only satisfactory way to make tests.

Chairman Schwab Discusses Bethlehem Company's Position

The Bethlehem Steel Corporation declared its regular quarterly dividends, payable Oct. 2, on both classes of common stock. Following a meeting of the board of directors, July 27, Charles M. Schwab, chairman of the board, described the outlook for improved business as encouraging. "The directors," he said, "concluded that the ability of the corporation to distribute accumulated earnings from its resources, due to conservative dividend policy during the period of large earnings, warranted the payment of the present dividend on the common stock."

Mr. Schwab said the building of additional open-hearth steel capacity to serve the plate, sheet and tin plate mills at the Sparrows Point plant is being planned. This is expected to add 300,000 tons annually to the company's capacity. He said further:

"Orders booked in the second quarter were much in excess of the first quarter and at gradually improving prices. Prices prevailing during the first quarter proved to be the lowest of the recent depression. Early in the second quarter a revived demand for steel developed, necessitating a rapid expansion of operations, which was accompanied by an increase in costs due largely to the high cost of fuel occasioned by the coal strike.

"The corporation's coal properties continued in operation during the quarter, but the difficulty of railroad movement under the present conditions has made it impossible to supply the corporation's full needs, necessitating some curtailment of operations.

"There has been an improvement in the inquiries for new ships, and the corporation has been able to secure some new business in that department. There has also been an increase in the amount of ship repair work. Our railroad passenger car business shows a much improved condition, capacity being taken for some time to come.

"The steel business for the next half of the year will be very much influenced by the duration of the coal and railroad strikes. There are large unfilled orders for steel, with substantial additional tonnage awaiting some assurance as to deliveries. Coupled with this there is a more general recognition of the necessity for a higher price basis for steel."

National Safety Council Meets at Detroit

At the eleventh annual meeting of the council, to be held at the new Cass Technical High School, Detroit, Aug. 28 to Sept. 1, inclusive, a safety exhibit will be open from 9 a. m. to 6.30 p. m. each day of the meeting, closing at 6 p. m., Sept. 1. Mention of the principal papers before the metals section was made in THE IRON AGE, July 6, page 27. The paper on "The Safe Handling of Gas at the Blast Furnace" will be read by G. M. Hohl, superintendent of blast furnaces, Bethlehem Steel Co., Bethlehem, Pa. The paper on "Safety in Crane Repairing" will be read by E. E. Remington, assistant superintendent of maintenance, Ford Motor Co., Detroit.

At the joint meeting of the automotive, drop forge and metals sections, at 9.30 a. m., Sept. 1, three papers will be read, followed by informal discussion, led by R. A. Shaw, on how co-operation between sections can help reduce accidents. The papers are "Safety in Handling Material," by C. E. Ralston, Equitable Life Assurance Society, New York; "How the Plant Surgeon Can Help in Accident Prevention," by Dr. L. A. Shoudy, Bethlehem Steel Co., Bethlehem, Pa.; "Safe Practices in Acetylene and Oxygen Welding," by H. S. Smith, Prest-o-lite Co., New York.

Employees of the Bay State Metal Wheel Co., East Templeton, Mass., have had a 15 per cent cut in wages.

Machinery Markets and News of the Works

MARKET QUIET

Few Lists Issued—Prospective Business in La Fayette Motors New Plant

Shopmen's Strike Holding Up Pending Railroad Business—First Half of Month the Best

The market during the week was quiet. Among the few lists issued was that of the Wright Aeronautical Corporation, Newark, which is getting prices on 20 or 30 tools; though the inquiry has been circulated among dealers in used machines, there is the probability that good used tools will have the preference. Four special lathes for piston-ring work wanted by Eldege Chansse, New Bedford, Mass., stands out among the week's news items. The New York Central continues to send out inquiries but is not expected to buy until the strike is ended. In the Pittsburgh district a few lists were issued, chiefly for manual-training school equipment.

In prospective business the outstanding item of the week is equipment that will undoubtedly be required by the La Fayette Motors Corporation, Indianapolis, for its new plant being erected at Milwaukee. Plans call for a works three times the size of the company's Indianapolis shops.

The effect of the coal and shopmen's strikes is still felt, but the settlement of these disputes, it is believed, will show a marked increase in machine tool sales. This expectation is based largely on the volume of business pending which has been deferred on account of the strike. It is also felt that if the railroad operators agree to the proposal of the Railroad Labor Board to do outside contracting on repair work, several Eastern railroads, at least, will then doubtless begin immediate rehabilitation of their own repair shops.

In Milwaukee the automotive industries are by far the best source of new business, and in Chicago, Cincinnati and other centers, some buying by automobile builders is noted. Buying by industrial companies showed a falling off. Bookings for export to countries not in the market for several months was a bright spot of the week in Cincinnati. Special machinery manufacturers in Cincinnati are working full time, and in New England many shops are busier than in months, due to taking on railroad shop work.

In all centers July started out promisingly, the business being done indicating that it would be the best of many months. In the latter half, however, sales fell off, and for the most part the month will not exceed, if equal, June. In Pittsburgh and Milwaukee and in some classes of machinery sold by New England companies, activity in July is reported as greater than June.

New York

NEW YORK, Aug. 1

THE machine-tool trade is looking forward to an early ending of the coal and railroad strikes in the confident belief that business will soon thereafter show a marked increase. This expectation is based on the volume of business pending, on which action has been deferred until labor troubles, with their possible disastrous consequences, are out of the way. July started out very promisingly, the business done in the first half indicating that it would be the best month since buying started on the upgrade. The latter half of the month, however, has been so beset with uncertainties that buyers have held off, and sales for the month will not exceed, if they equal, those of June.

Railroad buying should pick up soon after the strikes are settled, particularly if the carriers agree to the proposal of the Railroad Labor Board that they agree not to do outside contracting on repair work as one means of effecting a settlement. Several Eastern roads, which are alleged to have violated the Railroad Labor Board's decisions on outside contracting, will then doubtless begin the rehabilitation of their own repair shops. The New York Central continues to send out inquiries, but will do no buying until the strike is ended.

In the industrial field, the principal buying of the week was by the General Electric Co., Schenectady, N. Y., which placed orders for seven lathes and six shapers. The Wright Aeronautical Corporation, Newark, has a list of 20 or 30 tools on which it is getting prices, the inquiry first having been circulated among dealers in used machines, with the probability that good used tools will have the preference.

About 20 tools have been bought by the Navy Department, Washington, for the Naval Air Station at San Diego, Cal.

Activity in both locomotive and overhead cranes is well sustained. There have been a few closings this week and a number of current inquiries are quite active. Among the companies now in the market for cranes are the Phoenix Utility Co., 71 Broadway, New York, which is asking prices on a 60-ton, 1-motor crane, 24-ft. span; the United States Cast Iron Pipe & Foundry Co., Burlington, N. J., inquiring for a 10-ton, 2-motor, ladle crane. The U. G. I. Contracting Co., Philadelphia, will probably issue an inquiry shortly for an overhead traveling crane. Among recent purchases are:

J. G. White Engineering Corporation, 43 Exchange Place, New York, a 60-ton, overhead traveling crane from the Niles-Bement-Pond Co.

Egleston Brothers & Co., 166 South Street, New York, a 3-ton, 1 motor overhead traveling crane from Niles-Bement-Pond Co.

Michigan Copper & Brass Co., Detroit, Mich., a 5-ton, 3-motor overhead traveling crane from Niles-Bement-Pond Co.

Viele-Blackwell & Buck, 49 Wall Street, New York, a 35-ton overhead traveling crane for use in Canada from Niles-Bement-Pond Co.

Phoenix Iron Co., Phoenixville, Pa., twelve 5-ton, 35-ft. 6-in. span electric traveling cranes from the Roeper Crane & Hoist Works.

Kieckhefer Container Co., Camden, N. J., a 5-ton,

42-ft. span, hand power crane from the Roeper Crane & Hoist Works.

Technical High School, Omaha, Neb., a 3-ton, 46-ft. span, hand power crane from the Roeper Crane & Hoist Works.

American Woolen Co., Boston, Mass., a 10,000-lb. grab-bucket hoist for coal handling at Baltic Mills, Enfield, N. H. from the Shepart Electric Crane & Hoist Co.

Newport News Shipbuilding & Dry Dock Co., Newport News, Va., twenty-one 2-ton floor operated, electric hoists, one 5-ton riveter hoist and one 5-ton, single I-beam trolley from the Shepard Electric Crane & Hoist Co.

Hampton Co., Kenilworth, Ky., two 20-ton used Brownhoist locomotive cranes with 1-cu. yd. buckets from Philip T. King, 30 Church Street, New York.

Whitehead & Kales, Detroit, Mich., a 40-ton, 70-ft. boom, used industrial locomotive crane from Philip T. King, 30 Church Street, New York.

Italian Art Granite Co., Tilden Avenue, Brooklyn, N. Y., a 5-ton, 50-ft. radius, hand power, jib crane from W. J. Shoebridge, 96 Schermerhorn Street, Brooklyn, N. Y.

American Foundry Equipment Co., York, Pa., two 1-ton hand power jib cranes from H. D. Conkey & Co., 149 Broadway, New York.

The New York Edison Co., 130 East Fifteenth Street, New York, will commence the immediate erection of a new one-story power house at Thirty-second Street and Madison Avenue, estimated to cost about $200,000, with equipment. William Whitehill, Buckley Newhall Building, Sixth Avenue and Forty-first Street, is architect.

The Transit Commission, 49 Lafayette Street, New York, is arranging for the purchase of about 60 acres on the Shell Road, Brooklyn, as a site for new repair and construction shops for the New York Municipal Railway.

The Burnham Boiler Corporation, Irvington-on-Hudson, N. Y., is arranging a list of equipment for installation in a foundry and machine shop at Lancaster, Pa.

The Havana Electric Railway, Light & Power Co., 55 Liberty Street, New York, a New Jersey corporation operating at Havana, Cuba, is disposing of a bond issue of $3,600,000, a portion of the proceeds to be used for power plant extensions and improvements. Frank Steinhart is president.

The Thirty-Sixth Street Garage Corporation, 256 West Thirty-sixth Street, New York, has awarded contract to Nisnewitz & Goldstein, 277 Broadway, for a three-story automobile service and repair building at 103-7 West 108th Street, 75 x 100 ft., estimated to cost $80,000. Bloch & Hesse, 18 East Forty-first Street, are architects.

The Metropolitan Material Co., 1335 Flushing Avenue, Brooklyn, is planning for the installation of several new boilers, each about 100 hp., and auxiliary equipment at its power house.

Robert J. Moorehead, 311 East 200th Street, New York, will take bids at once for a new automobile service and repair building at Sheridan Avenue and 162nd Street, estimated to cost about $75,000. Charles Kreymborg, 2534 Marion Avenue, is architect.

The Superintendent of Lighthouses, Staten Island, N. Y., will receive bids until Aug. 16, for approximately 315 tons of various size stud link and open link mooring chain, ¾-in. to 2 in. in diameter.

The Department of Public Works, Albany, N. Y., will soon commence the construction of new repair shops at Waterford, Pittsford and Baldwinsville, N. Y., estimated to cost about $100,000, including equipment. C. L. Cadle is superintendent of public works.

The Mexican Petroleum Co., Ltd., 120 Broadway, New York, will commence the immediate construction of a new oil refinery at Tampico, Mex., estimated to cost close to $2,000,000, including machinery.

Charles P. Barnes, Central Avenue, Albany, N. Y., has awarded contract to the William G. Sheehan Construction Co., 28 DeWitt Street, for a three-story automobile service and repair building, with machine shop, 66 x 165 ft., estimated to cost approximately $80,000.

Halliwell & Co., New York, manufacturers of electrical equipment, have leased a floor in the building at Fourth Avenue and Twelfth Street, totaling about 13,000 sq. ft., for a local plant.

A vocational department will be installed in the new high school to be erected at Riverhead, N. Y., on which work will commence at once. It will cost about $250,000.

Albert Kahn, 1000 Marquette Building, Detroit, architect, will take bids at once for part of the mechanical equipment to be installed in the new plant of the Ford Motor Co. at Green Island, N. Y., for which certain building contracts recently were let.

In connection with its new hydroelectric power plant at Crescent Dam, N. Y., for which preliminary work is in progress, the State Department of Public Works, Albany, will operate a drydock and general ship repair shop at Watervliet, N. Y., for the barge canal boats. Tentative plans are also under consideration for a second hydroelectric generating plant at Visscher Ferry, with initial capacity of about 5600 kw.

The Adirondack Power & Light Corporation, Amsterdam, N. Y., is arranging for an increase in capital from $23,100,000 to $25,000,000, a portion of the proceeds to be used for plant additions and improvements.

The Dubilier Condenser & Radio Corporation, 217 Centre Street, New York, manufacturer of wireless equipment, condensers, etc., has arranged for the immediate removal of its plant to 48 West Fourth Street, where space recently was leased approximately double the present floor area. Additional equipment will be installed for increase in capacity. William Dubilier is president.

The Harlem Valley Electric Co., New York, has been organized with a capital of $100,000, to construct and operate an electric plant and system in portions of Dutchess and Putnam counties. The company is headed by J. G. Deane and W. Cook, Jr., care of Deane & Cook, 15 Park Row, New York.

Fire, July 21, destroyed a portion of the plant of the Charles Leffler Co., 49-61 Clymer Place, Brooklyn, manufacturer of presses, tools, dies, etc. An official estimate of loss has not been announced.

Fire, July 24, destroyed a portion of the ice-manufacturing plant and power house of the Littlefield Ice & Coal Co., Line Street and the Philadelphia & Reading Railroad, Hammonton, N. J., with loss estimated at close to $27,000. It is planned to rebuild.

The Borough Council, Sayreville, N. J., will receive bids until Aug. 16 for a 100,000-gal. steel tank on a 60-ft. steel tower, as per plans and specifications by Waldo S. Coulter, 114 Liberty Street, New York, consulting engineer. Frank P. Kolb is borough clerk.

A vocational department will be installed in the high school to be erected at Lyndhurst, N. J., now under consideration by the Board of Education. It is estimated to cost about $125,000.

The Essex Foundry Co., Murray Street, Newark, N. J., manufacturer of cast iron pipe, etc., will build a one-story addition, 84 x 110 ft.

The Ward-Bennet Automobile Repair Co., Newark, has leased property at 235 Halsey Street, for the establishment of an automobile service and repair shop. Charles E. Ward and F. H. Bennet head the company.

Fire, July 24, caused by lightning, destroyed a portion of the power house at the plant of the Balbach Smelting & Refining Co., 580 Market Street, with loss reported at close to $18,000. It will be rebuilt. Emil E. Dieffenbach is general superintendent.

A machine repair shop, 31 x 57 ft., to cost about $22,000, will be constructed by the Brunswick Laundry, Jersey City, N. J., at its plant at 222 Tonnelle Avenue. George A. Flagg, 665 Newark Avenue, Jersey City, is architect.

The American Metal Moulding Co., 141 New Jersey Railroad Avenue, Newark, has awarded contract to Enstice Brothers, 111 Academy Street, for a two-story addition to its plant on Coit Street, Irvington district, estimated to cost about $25,000. Gustave A. Johnson is president.

Philadelphia

PHILADELPHIA, July 31.

The Horn & Brannen Mfg. Co., 427 North Broad Street, Philadelphia, manufacturer of gas and electric fixtures, is arranging a list of equipment for its new plant at 1814-16 Spring Garden Street, recently acqpired, including drills, presses, automatic cut-off saws and other apparatus.

The Water Bureau, City Hall, Philadelphia, is planning to purchase two motor-driven pumps, capacity of about 4200 gal. per min. each. C. E. Davis is director.

The Willis-Sainte Claire Co., of Pennsylvania, 2033 Market Street, Philadelphia, has plans under way for a sixteeen-story and basement automobile service and repair building at 200 Broad Street, as a branch of the main plant of the company at Marysville, Mich. The William Steele & Sons Co., 1600 Arch Street, is architect and engineer. W. J. Foss is president.

Weston Dodson & Co., Inc., 1610 Spruce Street, Philadelphia, coal operator, has acquired the colliery of the Ship-

man Coal Co., near Shamokin, Pa., and contemplates extensions in the present plant, with hoisting, conveying and other operating machinery.

The Textile Machinery Co., Fourteenth Street, Chester, Pa., is reported to be arranging for the purchase of machine tools and other equipment, replacing that destroyed in a recent fire.

The Consumers Gas Co., Reading, Pa., a subsidiary of the United Gas Improvement Co., Broad and Arch streets, Philadelphia, has acquired local property as a site for a large soft coal gas manufacturing plant, with power house, machine shop and other operating departments, estimated to cost about $1,000,000, with equipment.

The Roberts & Mander Stove Co., Eleventh and Washington streets, Philadelphia, has awarded contract to the Austin Co., Bulletin Building, for a new two-story plant at Hatboro, Pa., 125 x 185 ft., estimated to cost about $50,000.

The Philadelphia Partition & Building Block Corporation, Medical Arts Building, Philadelphia, William Chapman, president, has completed plans for a new two-story factory, 100 x 200 ft., at Ritner and Twenty-eighth streets.

The National Biscuit Co., Tenth Avenue and Fifteenth Street, New York, has awarded contract to the Turner Construction Co., 1716 Sansom Street, Philadelphia, for a one-story automobile service and repair building, 130 x 184 ft., at Twelfth and Glenwood streets, Philadelphia, for company trucks and cars, estimated to cost about $55,000.

A power plant will be erected in connection with the twenty-story office building at Fifteenth and Chestnut streets, Philadelphia, estimated to cost about $4,000,000, for which plans have been completed by the Hoffman Henon Co., Finance Building, architects, for Albert H. Greenfield, owner.

The Freeman Electric Co., 803 East State Street, Trenton, N. J., will take bids at once for an addition to a one and three-story building at Mead and Prince streets, recently acquired, to be equipped as an assembling plant.

Nicholas W. Akimoff, Harrison Building, Philadelphia, mechanical engineer, has plans under way for a one and two-story factory, 100 x 500 ft., at Fifth and Water streets, Gloucester City, N. J., for the manufacture of Diesel engines and parts. A company headed by A. W. Grant and J. J. Y. McNally is being organized to operate the plant.

The West End Garage, West Hanover Street, Trenton, N. J., will build a two-story, brick and steel addition to its service and repair works. Harry C. Wood heads the company.

The Skillman Hardware Mfg. Co., West End Avenue, Trenton, N. J., will install two new presses and other equipment in its one-story addition, 32 x 60 ft., now in course of construction.

A vocational department will be installed in the new junior high school to be erected by the Board of Education, Camden, N. J., estimated to cost about $562,000. A site is benig selected in the vicinity of Park Boulevard and Euclid Avenue.

The Cadillac Automobile Co., 525 Market Street, Camden, N. J., is completing plans for a four-story service and repair building, 48 x 126 ft., estimated to cost about $100,000. Lackey & Hettel, 509 Federal Street, are architects.

The Lock Haven Electric Light & Power Co., Lock Haven, Pa., is planning for the erection of a new power house at Castanea, Pa. Bonds for $200,000 have been issued.

The Pennsylvania Wireless Mfg. Co., Inc., New Castle, Pa., is planning for the installation of machinery for the manufacture of radio equipment and parts, in a factory on Florence Avenue.

Harry K. Smith and John Minnich, Wrightsville, Pa., have construction under way on a factory to manufacture thermometers and other instruments. The equipment of the American Thermometer Co., Columbia, Pa., has been purchased and will be removed to the Wrightsville works. Other machinery will be installed and a company will be organized to operate the plant.

The Excelsior Coal Co., West Excelsior, near Sunbury, Pa., is considering rebuilding its coal washery destroyed by fire July 14.

The Board of Control, Scranton, Pa., will equip a new power plant for its institutions at Adams Avenue and Gibson Street, estimated to cost about $61,000. J. H. Williams, Administration Building, 425 Washington Avenue, is president.

The Merchants' Shipbuilding Corporation, Chester, Pa., is arranging to devote a portion of its plant to railroad car and locomotive repair work, and has negotiations under way for contracts of this character. R. H. M. Robinson is president.

The Glen Alden Coal Co., 306 Jefferson Avenue, Scranton, Pa., will build a one-story machine repair shop at its Woodward Colliery, near Wilkes-Barre, Pa.

Chicago

CHICAGO, July 31.

WHILE July started with every promise of running ahead of June in machinery sales, with most of the trade it will fall somewhat behind, both in sales and values. The first half of the month was easily the best that the local trade has had since the revival in business, but the strike of the railroad car shopmen became quite effective in cutting off railroad buying the last two weeks. The Atchison, Topeka & Sante Fe Railroad had awarded by July 15 about half of the tools on a list issued several weeks ago and has not since made any additional purchases. Lists of the Union Pacific, Illinois Central and the Chicago, Burlington & Quincy have been dormant the past few weeks and are expected to remain so as long as the strike of the shopmen continues. Demands from other sources also have dwindled the past week or two, although some buying by automobile builders still is observed, and one company making an extension to its plant has put out an inquiry for a few tools. It is believed that the Studebaker Corporation has about completed the tool purchases for its latest extension. Dealers, while noting some falling off in new inquiries, report that they have lately booked a number of orders.

The Whiting Corporation, Harvey, Ill., has taken a 50-ton, 63-ft. span electric traveling crane for the Fort Dodge Gas & Electric Co., Fort Dodge, Iowa, placed through the United Light & Railways Co., Davenport, Iowa.

The Hyde-Schneider-Haley Mfg. Co., Ninth Street and Harrison Avenue, Rockford, Ill., recently incorporated with a capital of $60,000, will manufacture equipment for oil storage stations, such as pumps for unloading cars, valves and other oil specialties. It has purchased a factory and all of the necessary machinery. The officers are George S. Haley, president; Lester B. Hyde, vice-president, and Eduard A. Schneider, secretary-treasurer.

The National Tile Co., Anderson, Ind., has placed contract for a one-story addition, 85 x 496 ft., and contemplates further extensions to its plant.

The Calumet Tank & Mfg. Co., Hammond, Ind., will soon start work on a one-story foundry, 60 x 130 ft., to cost $75,000.

The Durand Steel Locker Co., 76 West Monroe Street, Chicago, has awarded contract to the Arnold Co., 105 South LaSalle Street, for a one-story addition to its plant at Chicago Heights, totaling about 25,000 sq. ft., estimated to cost $90,000.

The Southern Colorado Power Co., Pueblo, Col., has arranged for a bond issue of $6,000,000, a portion of the proceeds to be used for plant extensions and improvements.

The Northern States Power Co., 208 South LaSalle Street, Chicago, has made application for permission to construct and operate a hydroelectric power plant on the St. Croix River in the vicinity of Kettle Falls.

The United States Reclamation Service, Denver, Col., will receive bids until Sept. 6, for electrical machinery, including motors, transformers, switching apparatus, etc., for the valley drainage pumping plant, Yuma project, Ariz.; also until Aug. 21, for cast iron conduit linings for the Hubbart Dam, Flathead project, Mont. A. P. Davis, Washington, is director.

A vocational department will be installed in the two-story and basement high school, 100 x 120 ft., to be erected at Elkhart, Ill., estimated to cost about $90,000. F. J. Klein, 331 Main Street, Peoria, Ill., is architect.

The Bastian Blessing Co., 125 West Austin Avenue, Chicago, manufacturer of welding apparatus, has acquired the manufacturing end of the business of the St. Paul Welding & Mfg. Co., St. Paul, Minn., and will add a line of soldering equipment, trucks, etc., to its regular manufacture. The St. Paul company will act as a service branch in its locality.

The Brooks Mining Co., Louisville, Col., is planning to rebuild the tipple at its local mines, destroyed by fire July 22.

The Service Rubber Co., 401 Central Trust Building, Rock Island, Ill., has awarded contract to the Brissman Construction Co., 407 Moline Trust Savings Bank Building, Moline, Ill., for its three-story plant on Second Street, 60 x 300 ft., estimated to cost about $100,000, including machinery. J. T. Crowley heads the company.

The Fort Dodge Gas & Electric Co., Fort Dodge, Iowa, will commence construction late in August for a new electric generating plant with initial capacity of about 5000 kw.,

estimated to cost $500,000, with machinery. B. J. Denman is chief engineer; Mark Anderson is general manager.

The City Council, Shelbyville, Ill., is arranging a special election to vote bonds for $100,000 for the construction of a municipal electric power plant. Fuller & Beard, Chemical Building, St. Louis, are engineers.

The Davenport Ice Co., 114 Myrtle Street, Davenport, Iowa, has preliminary plans for a new ice-manufacturing plant. The George B. Bright Co., 103 Marquette Building, Detroit, is engineer. George Albrecht is president.

The W. H. Maze Co., Peru, Ill., manufacturer of nails, etc., has awarded contract to the Austin Co., 208 South LaSalle Street, Chicago, for a one-story addition, 75 x 140 ft., estimated to cost about $65,000.

Fire, July 21, destroyed a portion of the plant of the Mulholland Brothers Silverplate Co., Aurora, Ill., with loss approximating $200,000.

Buffalo

BUFFALO, July 31.

The Lockport Foundries Corporation, Lockport, N. Y., has plans under way for additions. It has acquired control of the Jefferson Union Co., Lexington, Mass., manufacturer of pipe unions, etc., and plans to increase the local works to accommodate this branch of manufacture. Robert E. Bryant is treasurer and general manager.

The Swan Garage, Inc., Ellicott Square, Buffalo, is completing plans for a new three-story automobile service and repair works, 90 x 115 ft. Kidd & Kidd, 232 Delaware Avenue, are architects. C. J. Irwin is president.

The Angert Auto Parts Co., 601 Bailey Avenue, Buffalo, is planning for the installation of machinery to manufacture automobile motors, parts, etc. S. Angert is president.

A vocation department will be installed in the new high school to be erected at Bath, N. Y., estimated to cost about $220,000. Palmer, Rogers & Smith, 101 Park Avenue, New York, are architects.

Fire, July 22, destroyed a portion of the works of the Broadalbin Light & Power Co., Broadalbin, N. Y. with loss estimated at $25,000.

The plant and property of the Ericsson Mfg. Co., 1100 Military Road, Buffalo, manufacturer of magnetos, ignition equipment, etc., has been acquired at receiver's sale by Edward L. Jellinek, Prudential Building, for $250,000. The purchaser represented certain stockholders of the company. It is said that reorganization plans will be perfected in the near future and the plant placed in service.

The Ramp Garage, Inc., Buffalo, recently organized with a capital of $1,500,000, has plans nearing completion for a new six-story automobile service and repair building at South Elmwood Avenue and West Mohawk Street, estimated to cost about $500,000. The company is headed by Robert Allen, Charles A. Klocke and Harry N. Kraft.

The Twin Filter Co., Buffalo, is planning for the installation of equipment to manufacture water filters. G. W. Barker, 78 Tioga Street, one of the heads of the company, is in charge.

The Elmira Water, Light & Railway Co., Elmira, N. Y., will make extensions and improvements in its plant and system to cost about $350,000. Bids will soon be asked on machinery, cooling equipment and other operating apparatus. F. H. Hill is general manager.

Power plant extensions will be made by the Jamestown Worsted Mills, Inc., Jamestown, N. Y., in connection with other mill improvements, to include new pumping machinery, condensers, ash-handling equipment, etc. The entire work will cost in excess of $100,000. Lockwood, Greene & Co., Hanna Building, Cleveland, are architects and engineers.

The Board of Education, Dunkirk, N. Y., will receive bids until Aug. 14 for machinery, tools and other equipment for the local vocational schools.

The State School for Metal Defectives, Rome, N. Y., is taking bids until Aug. 7 for engines, motor-generators and auxiliary equipment for the power and lighting plant. C. J. Severance is president.

A vocational department will be installed in the new three-story high school to be erected at Sinclairville, N. Y., 55 x 103 ft., estimated to cost about $75,000, exclusive of equipment. Beck & Tinkham, 317 Washington Street, Jamestown, N. Y., are architects.

The Jamestown Malleable Products Co., Tiffany Avenue, Jamestown, N. Y., is planning for the installation of equipment, including annealing ovens, etc. H. E. Kies is general manager.

The Morse Chain Co., Ithaca, N. Y., plans to erect new works in Detroit. It recently completed its power plant in Ithaca, changing from direct to alternating current, also adding 1000 hp. in Babcock & Wilcox boilers and 2300 kva. to the electric equipment.

New England

BOSTON, July 31.

THE July New England machine-tool market closed quietly. No new business of importance developed the last week, while sales were confined to a very few new and used tools, which in the aggregate represented a small investment. Large industries contemplating purchases of machinery have deferred action until the railroad and coal labor atmosphere is clearer. Sales included a new 15-in. Hendey shaper to the Rhode Island Braiding Machine Co., Providence; new bench drill equipment to George Knight & Co., Brockton, Mass.; a 14-in. x 6-ft. lathe, 16-in. shaper and a No. 2 universal milling machine, used tools, to a South Boston manufacturer, and other individual used tools of small value. Bids are in for Boston's school list, but no award has been made. The largest new inquiry is for four special lathes wanted by Eldege Chansse, North Front Street, New Bedford, for piston ring work.

Local representatives of makers of heavy machinery state that July was the best month this year, but reports by dealers handling used and new equipment and second-hand machine tool houses are quite contrary. Several machine tool builders in New England are busier than in months, due to taking on railroad shop work, it being necessary in some instances to hire extra machinists. Such activity, together with indications of the textile industry slowly overcoming labor troubles, is the basis for a better feeling among makers and sellers of metal-working equipment. While advances in prices are lacking, machinery values are firmer as few sellers are willing to give extra discounts to secure business.

The Boston Supply Department, City Hall Annex, has taken bids on a fairly large turbine driven feed pump for the city hospital.

Bids have closed on a one-story, 60 x 140 ft. sales and service station to be erected on Highland Avenue, Somerville, Mass., by H. A. Steeves, Carleton Road, Belmont, Mass.

Plans are being prepared for a three-story building to house the mechanical department of the Woonsocket *Daily Call*, Woonsocket, R. I.

Articles of association have been filed by the Mastercrafts' Corporation, Brattleboro, Vt. It owns patents on an electrical windshield cleaner, and has awarded a contract for 100,000 with an Elbridge, N. Y., concern. Present plans are to eventually manufacture the device at Brattleboro. W. E. Stellman, Stellman Machine Shop, that city, is interested in the company.

The Hollander Brothers Co., 360 George Street, Bridgeport, Conn., manufacturer of sheet metal goods, has purchased a factory on Barnum Avenue, formerly occupied by the Columbia Graphophone Mfg. Co. The building contains 30,000 sq. ft. of floor space, and the property extends along the east end freight yards of the New York & New Haven Railroad. Henry Hollander, president of the company, states that about $10,000 would be expended in remodeling the structure.

The McCathron Boiler Works, 72 Knowlton Street, Bridgeport, Conn., is in the market for an air compressor.

The New York, New Haven & Hartford Railroad Co. will lease the war-time plants of the Groton Iron Works, Groton, Conn., and employ about 700 men. An official of the company stated that "inability to get certain grades of work done at the New Haven repair shops caused the move."

The Specialty Bolt & Rivet Works, 132 Hillside Avenue, Shelton, Conn., is planning for the installation of new machine tools, including surface grinder, threading machine, etc.

Fire, July 24, destroyed a portion of the shops, engine house and other property of the Rutland Railroad Co., Rutland, Vt., at Alburg, Vt., with loss reported in excess of $175,000.

The Winsted Gas Co., Winsted, Conn., will build a new hydroelectric power plant at Robertsville Falls, to replace a present power house. Two new water-wheels, generators and auxiliary electrical machinery will be installed.

The Hayes-Meserole Mfg. Co., Milford, Conn., recently

organized with a capital of $100,000 to manufacture wire products, has leased a portion of the plant of the United States Rubber Co.

J. L. Anthony & Co., Providence, R. I., manufacturers of jewelers' findings, etc., have removed to their new plant at 115 Baker Street, where additional equipment will be provided for increased output.

The Central Maine Power Co., Augusta, Me., will issue preferred stock for $289,855, the proceeds to be used for extensions and improvements in power plants and system.

A vocational department will be installed in the new three-story high school to be erected at Sawyer Road and Colon Street, Beverly, Mass., estimated to cost about $750,000. Adden & Parker, 177 State Street, Boston, are architects.

The New England Collapsible Tube Co., New London, Conn., has leased a three-story building, 50 x 100 ft., at 3132-34 South Canal Street, Chicago, for a Western branch works.

The Fairfield Battery Co., East Norwalk, Conn., has tentative plans for rebuilding its plant on Kaiser Place, partially destroyed by fire July 21, with loss estimated at about $40,000, including equipment. The company is also known as the Hi-Po Battery Co.

Lynnfield Damon, Jr., Hull, Mass., care of Bradford Weston, Allerton, Mass., contractor, will commence the immediate erection of a new one-story automobile service and repair shop, 95 x 110 ft., on Atlantic Avenue, Nantasket, Mass.

The United Electric Railways Co., Providence, R. I., has had plans prepared for a one and two-story automobile service and repair plant, 88 x 250 ft., at Melrose and Russell streets, for company motor trucks and buses.

A vocational department will be installed in the three-story high school, 80 x 153 ft., with extension, 60 x 65 ft., to be erected at Belfast, Me., for which bids on a general contract are being received. Kilham, Hopkins & Greeley, 9 Park Street, Boston, are architects.

Cincinnati

CINCINNATI, July 31.

THE rail and coal strikes have somewhat affected the machine tool industry. It was expected that railroads with lists out would place large orders during July, but buying from this source has been confined to tools absolutely needed. How much some roads are in need of equipment was illustrated the past week when instructions were received by a number of local manufacturers to ship tools on order as soon as completed. Buying from industrial concerns showed a falling off, but a number of orders from the automotive industries were taken by local builders.

Perhaps the brightest spot in the trade is the receipt of several export orders. This business does not amount to a large volume, but is interesting from the fact that the orders are the first to be booked from several countries for many months. Sweden, Japan, Argentina, Brazil and the Philippine Islands were among the countries which bought tools the past week. Canada continues to take a fair number, both for domestic needs and for export, particularly to South American countries.

Special machinery manufacturers are working practically full time, and some have been forced to turn down orders for their regular lines on account of not being able to make deliveries wanted. Dealers report a fair demand for used tools, with better prices being secured.

The Erie Railroad is planning to consolidate the shop, roundhouse and terminal facilities of the Kent, Marion and Cincinnati divisions of the road at Marion, Ohio, and will spend approximately $750,000 for new buildings, according to an announcement by railroad officials at Marion this week.

The Ideal Concrete Machinery Co., Cincinnati, has awarded contract for a new factory on Spring Grove Avenue to the W. F. McConnell Construction Co., work to commence immediately. It manufactures tumbling barrels and concrete mixing machinery.

The Cynthiana Carriage Co., Cynthiana, Ky., will move its head office and main plant to Covington, Ky., in the near future. A definite location has not been secured, but it is likely that the company will erect a new plant. J. W. Leek, Cynthiana, is president and treasurer.

Pittsburgh

PITTSBURGH, July 31.

ALTHOUGH only a few machine tool lists are coming out in this district, and these chiefly for manual training schools, sales and inquiries are satisfactory. Several local dealers state that their sales for July will exceed those for June which in turn showed improvement over May. This record has been built up chiefly on sales of individual tools. Some dealers who have been going among possible buyers instead of waiting for the buyers to come to them, are figuring on more prospective business than in many months. There has been a considerable change of opinion with regard to stocks of new and used machinery in the past few months. Earlier in the year it was thought that manufacturers' stocks were so large and so many good used tools were available that the machine-tool trade could not well hope for normally good times until 1923. But this view does not, in the light of the betterment in business over the past few months, find much support now.

Pittsburgh seems less affected by the coal mine and railroad labor troubles than some other parts of the country, as two of the principal rail arteries of the city claim to be operating 100 per cent and thus far have not found it necessary to put into effect the coal priority system. They are delivering and not confiscating coal, which is helpful to plant operations here. At the same time, not many machine-tool orders are being placed by the railroads.

New crane inquiries have not been especially numerous the past week, but local offices have many prospective orders, among them seven 3-ton floor control cranes and two 10-ton cab control cranes for an Ohio machine tool manufacturer. It is expected that a Pittsburgh district sheet maker this week will close for a couple of cranes, one of 50 tons capacity and the other 15 tons. A steel maker in this district recently broke ground for an addition and is expected to buy some mill type cranes. The Graham Bolt & Nut Co., Pittsburgh, recently closed for a 10-ton crane with the Pawling & Harnischfeger Co.

The Du Roth Steel Truck & Car Wheel Co., 611 Keystone Building, Pittsburgh, has plans nearing completion for new works at Osgood, Pa., estimated to cost in excess of $800,000, including equipment. C. Edward Long, 1202 Peoples' Bank Building, is engineer.

The Clarion River Power Co., Foxburg, Pa., C. B. Hawley, 450 Munsey Trust Building, Washington, in charge, has made application for permission to construct and operate three hydroelectric power plants on the Clarion River. One will be located in the vicinity of Beaver; another near Mill Creek; and the third near Foxburg. The company is operated by the Penn Public Service Co., Johnstown, Pa., F. T. Hepburn, president.

The Duquesne Light Co., 435 Sixth Street, Pittsburgh, is organizing the Bellevue Light Co., as a subsidiary, to take over and operate the property of the Southern Heat, Light & Power Co., North Boroughs section. Extensions and improvements are planned.

The Board of Education, Farrell, Pa., is arranging a list of machine tools, bench tools and wood-working machinery for the vocational department of the new school.

The Warren Steel Car Co., Starbrick, Pa., will commence the immediate erection of a new one-story plant, 90 x 260 ft., to replace the portion of its works recently destroyed by fire. It will cost about $75,000. W. W. Muir is president.

Fire, July 20, destroyed the box factory, wood-working shop and other mechanical departments at the plant of the American Window Glass Co., Arnold, Pa., with loss estimated at about $180,000, including machinery. It is planned to rebuild.

The Atlantic Refining Co., Fifty-sixth and Butler streets, Pittsburgh, is planning for an addition to its local oil refinery. Headquarters of the company are at 3144 Passyunk Avenue, Philadelphia.

The Kennedy Township Light Co. and the Neville Township Light Co., are being organized under State laws by C. P. Morrison, E. P. Griffiths and J. R. McNary, 435 Sixth Ave-

nue, Pittsburgh, to install and operate electric light and power plants and systems in Kennedy and Neville townships.

The West Penn Power Co., West Penn Building, Pittsburgh, is planning to rebuild the portion of its power house at Vandergrift, Pa., destroyed by fire July 23 with loss estimated at about $25,000.

The Coal Valley Machine & Electric Co., Montgomery, W. Va., has awarded contract to C. H. Williamson & Co., Montgomery, for a new plant, 50 x 100 ft., to manufacture mine cars and other iron and steel products. The company has a 2-acre site and will erect other buildings later. E. R. Howery is secretary.

The J. G. Dickson Co., Pittsburgh, manufacturer of metal products, has removed its plant from 241 South Main Street to 317 South Main Street, where larger space will be provided for increase in output.

The Hornor Brothers Co., Clarksburg, W. Va., is planning the erection of a new ice-manufacturing plant at Shinnston, W. Va., estimated to cost close to $35,000.

A vocational department will be installed in the two-story and basement high school, 103 x 128 ft., to be erected at Wayne, W. Va., estimated to cost about $180,000, on which work will commence at once. Holmboe & Pogue, Empire Bank Building, Clarksburg, W. Va., are architects.

The F. A. Jones Stone Co., 616 Forest Avenue, Zanesville, Ohio, is planning the equipment of a stone quarry plant at Martinsburg, W. Va. It has a tract of about 40 acres.

Cleveland

CLEVELAND, July 31.

WHILE reports vary as to the volume of machinery business, several local dealers are getting a fair number of orders and some are working on many small lot inquiries and, in fact, have more live prospects than for several weeks. On the whole the market appears to be fully as active as at any time in the past few weeks and July sales evidently will be equal to those of June. Railroad inquiries and orders have entirely disappeared as a result of the shopmen's strike. The inquiries coming out are from well scattered sources, but largely from the automobile and parts manufacturers and some industries more or less closely allied to the automobile trade. Detroit automobile manufacturers continue to place small lots orders that in the aggregate amount to considerable business. The demand at present is largely for new machinery.

The Apex Electrical Mfg. Co., manufacturer of washing machines and other electrical household appliances has acquired the plant of the Cleveland Smelting & Refining Co., on Bessemer Avenue, and will install a foundry in a section of the plant and use other portions for the manufacture of motors.

The Brass & Aluminum Products Co., 5119 Euclid Avenue, Cleveland, has acquired a one story brick building, 66 x 180 ft., at 7708 Quincy Avenue and will move to this location shortly. It manufactures automobile hardware and oil and grease cups. Some new equipment will probably be installed.

The Kranz Mfg. Co., Brooklyn, N. Y., a subsidiary of the Westinghouse Electric & Mfg. Co., and manufacturer of safety switches, will move its plant to Mansfield, Ohio, and locate in the building of the Westinghouse Electric Products Co.

The Weldless Tube Co., Wooster, Ohio, has placed orders for equipment for its new plant, now under construction. It will consist of a main building, 110 x 500 ft. and an annealing and pickling department, 50 x 110 ft. A piercing mill, other mill equipment and draw benches will be furnished by the Woodard Machine Co., Wooster, and some other equipment by the A. Garrison Foundry Co. The General Electric Co. will supply the electrical equipment and the Alliance Machine Co. four electric traveling cranes. It is expected to have the plant completed about Oct. 1. The company has recently increased its capital stock to $1,000,000.

The K-W Brick Co., Warren, Ohio, has been incorporated with a capital stock of $150,000 and will build a plant to manufacture slag brick from slag supplied by the Trumbull-Cliffs blast furnace. J. Whittaker is president, and Robert W. Swift, secretary and general manager.

The Ohio Pumping Machinery Co., Akron, Ohio, which will move its business from Fitchburg, Mass., to Akron, plans the erection of a foundry and machine shop.

The Pederson Machine Co., Mansfield, Ohio, has been organized to manufacture umbrellas and will establish a plant in a building formerly occupied by the Ideal Electric & Mfg. Co.

The F. A. Colman Co., Cleveland, has recently taken orders for four core ovens for the Owosso, Mich., plant of the American Malleable Co., four core ovens for the Flint Foundry Co., and several ovens for the Apex Electric Mfg. Co., Cleveland.

Catalogs Wanted

The Broden & Dailey Construction Co., engineer and builder, room 411 Union Building, 1836 Euclid Avenue, Cleveland, has recently opened an office and desires manufacturers' catalogs.

Baltimore

BALTIMORE, July 31.

Unger & Mahon, Inc., Pratt and Gay streets, Baltimore, engineer, operating a marine railroad and other shipyard properties, has plans under way for a new one-story ship repair plant in the Sparrows Point district, estimated to cost about $50,000. F. W. Unger is president.

The Office of the Purchasing Agent, Post Office Department, Washington, will receive bids until Aug. 9, for one 3 hp. heavy duty floor grinder and two single arbor emery wheels; also until Aug. 11 for two stationary air compressors, motor-driven, for installation at the post offices at Philadelphia and Cleveland.

The Clarksville Farmers' Implement & Supply Co., Clarksville, Va., has tentative plans for a new one-story factory to manufacture farm implements, etc. H. A. Noblin is secretary.

The Acme Mfg. Co., Acme, N. C., is making inquiries for a 250-hp. power generator set, direct-connected to engine, and including auxiliary equipment.

The Virginia-Carolina Chemical Co., Richmond, Va., manufacturer of fertilizer products, is disposing of a bond issue of $12,500,000, a portion of the proceeds to be used for a new plant and extensions and improvements in present works. C. G. Wilson is president.

The Geer Industrial School, Geer, near Charlottesville, Va., will build a new power house.

The Travelers Garage Corporation, Norfolk, Va., has awarded contract to Baker & Brinkley, Dickson Building, for a new one-story service and repair building, 120 x 160 ft., on Cove Street, estimated to cost about $45,000. W. P. Tunstall, Bank of Commerce Building, is architect.

The Bureau of Yards and Docks, Navy Department, Washington, will commence the immediate erection of a new machine shop at the Naval Base, Pearl Harbor, H. T., estimated to cost about $186,000.

A vocational department will be installed in the proposed new high school to be erected at Claymont, Del., for which bonds for $275,000 have just been voted.

The Maurice Chemical Co., 1427 Washington Boulevard, Baltimore, recently organized, will operate a plant to manufacture refractory and high temperature cements for furnace and other service. A list of equipment is being arranged. D. E. Collins is president.

Traveling cranes, freight handling and conveying machinery, etc., will be installed on the proposed new pier to be constructed by the Port Development Commission, Baltimore, at the McComas Street Terminal, and leased to the Western Maryland Railroad Co., Baltimore. It will be 260 ft. wide and 1800 ft. long, and is estimated to cost approximately $3,000,000.

The Franklin Motor Car Co., 1017 North Eutaw Street, Baltimore, has awarded contract to the Consolidated Engineering Co., Calvert Building, for a two-story repair building, 88 x 100 ft., estimated to cost about $35,000, exclusive of equipment.

The Felstone Co., 326 Haywood Building, 46 Haywood Street, Asheville, N. C., has plans under way for the erection of a new factory, 56 x 115 ft., to manufacture concrete products. A list of equipment is being arranged. C. Marshall Gravatt heads the company.

J. E. Doherty, 2405 Granby Street, Norfolk, Va., will equip a machine and repair shop in connection with an automobile service works.

The Fayetteville Ice & Mfg. Co., Fayetteville, N. C., is perfecting plans for rebuilding its ice-manufacturing plant, recently destroyed by fire. It will have a daily capacity of 90 tons, the installation to include electric pumping machinery, electric hoists, conveying machinery, etc., in addition to main equipment. J. F. Harrison is president.

The Lowtenburg-Goodman Co., 127 Granby Street, Nor-

folk, Va., has rejected all bids recently received for a new two-story automobile service and repair building, 130 x 405 ft., and will call for new bids at an early date. Calrow & Wreen, Monroe Building, are architects.

The Fulton & Barnes Co., 1643 West Broad Street, Richmond, Va., is planning to purchase machine tools for installation in its automobile service building.

The Atlantic Ice & Coal Corporation, Athens, Ga., will soon commence the erection of a new ice and cold storage plant on Oconee Street.

Eugene F. Bates, Greenville, S. C., has awarded contract to the Fiske-Carter Construction Co., Greenville, for a new automobile machine and repair shop, 65 x 95 ft. J. E. Sirrine & Co., Greenville, are architects.

A. B. Pounds, Concord, N. C., operating a local ice-manufacturing plant, is planning for enlargements, to include the installation of a 25-ton electrically operated ice machine and auxiliary equipment.

Milwaukee

MILWAUKEE, July 31.

SALES of machine tools in July represent a substantial gain over June, continuing the upward rise which had its beginning in March. Each succeeding month has shown consistent gains. At the same time, production has come forward, although it still is not yet possible to operate at normal capacity. Conflicting news relative to the railroad and coal strikes undoubtedly contributed something to the activity in the past two weeks. The automotive industries are by far the best source of new business. Railroad business is hard to close, due to the uncertainties of the labor situation, but some urgent needs are being filled from time to time.

The LaFayette Motors Corporation, Indianapolis, has completed arrangements to transfer its entire operation, headquarters and general offices to Milwaukee by Nov. 1, according to announcement made by Charles W. Nash, president of this concern and the Nash Motors Co., Kenosha, Wis. Contracts have been awarded for the erection of the first unit of a new LaFayette passenger car works on Clement, south of Oklahoma avenues, Milwaukee, adjoining the four-cylinder car division works of the Nash Motors. The first building will be of brick and steel, 250 x 950 ft., with steel sidewall and monitor sash, and will be erected by the H. K. Ferguson Co., Cleveland. The general contractors are Theodore Stark & Co., 130 Muskego Avenue, Milwaukee. A considerable list of machine tool and other shop equipment will be required, the capacity of the new factory being planned at three times the capacity of the original plant at Indianapolis, which will be abandoned and placed on the market and the equipment moved to Milwaukee. The new construction undertaken by the LaFayette company is entirely distinct and separate from a large new sheet metal and body shop being erected by the Nash Motors Co. as an addition to its Milwaukee four-cylinder car division, reported previously.

The Air Reduction Sales Co., Inc., 342 Madison Avenue, New York, will build a branch plant in Milwaukee for the manufacture of oxy-acetylene welding and cutting apparatus, with a proposed initial investment of $135,000, according to official advices received by the Milwaukee Association of Commerce. The company during the past week acquired five acres on Buffum Street, and expects to begin work about Aug. 15 on the erection of a shop, power house, generating and filling plant and auxiliary buildings. Edward L. Fiddyment, 272 South Water Street, Milwaukee, is local manager. It is understood that a branch plant will also be built at Birmingham, Ala.

Roy Herman, automobile dealer and repairer, Black Earth, Wis., will build a garage and service station, 70 x 90 ft., two stories and basement, estimated to cost about $20,000 complete.

The Pittsburgh Plate Glass Co., 213 Lake Street, Milwaukee, has let the general contract to the Dahlman Construction Co., 456 Broadway, for a five-story building, 86 x 154 ft., at Lake and South Water streets, to serve as a research laboratory, factory, warehouse and office building for the Patton-Pitcairn Division, manufacturing paints and varnishes, at Milwaukee. The investment will be in excess of $250,000. The architects are Kirchhoff & Rose, 221 Grand Avenue.

The Madison, Wis., Garage & Machine Co. has been organized by C. L. Lodine and has opened a garage and repair works at 18-24 North Charter Street. The machine shop will be under the management of Samuel Olson, formerly with the Gisholt Machine Co., Madison. A small list of equipment remains to be purchased.

The United States Engineer Office, Duluth, Minn., is asking sealed bids until Aug. 14 for constructing and delivering a steel derrick scow, complete with machinery and equipment.

The Edwards Motor Car Co., 2709-2715 Grand Avenue, Milwaukee, Dodge distributor and dealer, will build a new sales and service building costing $100,000 on Grand Avenue. It will be 100 x 120 ft., two stories and basement, of reinforced concrete. The general contract has been let to the Coddington Engineering Corporation, 290 Third Street, local, by Voelz & Siebert, architects, 373 Broadway.

The Marathon Motor Car Co., 210 McClellan Street, Wausau, Wis., has let the general contract to Frank Seefeldt & Co., local, for a four-story addition, 60 x 120 ft., estimated to cost $75,000. Two floors will be equipped as a machine and repair shop.

The Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis., has announced plans for new construction and equipment work at its Canadian mill unit at Fort William, Ont., estimated to cost $1,000,000. The enlargement of the plant calls for increasing the capacity of the mill 100 per cent and the installation of a new 100-ton paper mill. The capacity of the hydroelectric generating plant, now producing 1500 hp., will immediately be increased to 10,000 hp. to accommodate the enlarged capacity. The present mill at Fort William was acquired recently for $200,000 from the Kaministiquita Paper & Pulp Co. The new owners are operating it as the Thunder Bay Paper Co. George W. Mead, Wisconsin Rapids, is president and general manager; F. N. Youngman is local manager.

The C. A. Shaler Co., Waupun, Wis., manufacturer of vulcanizing apparatus, tire specialties and automotive accessories, resumed production Aug. 1 in its new plant, erected at a cost of $166,000 to replace the factory which burned last February. Practically all of the new equipment has been contracted for, but further purchases are being made from time to time. C. A. Shaler is president.

The Board of Education, Madison, Wis., let the general contract to L. B. Gilbert, local, for a one-story brick and concrete addition, 78 x 80 ft., to the Madison high school, to serve as a manual arts institute. It will cost about $50,000. Equipment will be purchased in about 60 days. Frank Riley is architect.

The Ottawa, Ill., Silica Co. will build a new power plant and has let the structural steel work, involving about 100 tons, to the Lakeside Bridge & Steel Co., Milwaukee.

The Biggam Trailer Co., formerly located in the First Wisconsin National Bank Building, Milwaukee, has completed the equipment of its permanent plant at Racine, Wis., where is occupies 18,000 sq. ft. in the Racine Industrial Community Building, Racine Junction. It is now manufacturing a line of trailers ranging in capacity from 800 lb. to 5 tons.

The J. A. Grimm Coal Co., Hartford, Wis., has engaged Peacock & Frank, architects and engineers, 445 Milwaukee Street, to design a new coal storage and handling plant, estimated to cost about $20,000.

The Production Pattern & Equipment Co., Milwaukee, has moved its plant and offices from 92-94 Second Street to the new building at Broadway and Erie streets, where it occupies 15,000 sq. ft. It manufactures patterns, molding machines, flasks, core driers and other foundry appliances and equipment. P. E. Keller is secretary-treasurer and manager.

Detroit

DETROIT, July 31.

The Holley Carburetor Co., Vancouver Avenue and the Pere Marquette Railroad line, Detroit, is taking bids on a general contract for a one-story addition, 120 x 195 ft. Albert Kahn, 1000 Marquette Building, is architect.

Porath Brothers, Detroit, are planning to rebuild the portion of their brick manufacturing plant, recently destroyed by fire with loss estimated at about $50,000, including equipment.

The Martin-Perry Corporation, York, Pa., manufacturer of automobile bodies, has leased a portion of building No. 18 at the plant of the Dort Motor Car Co., Flint, Mich., totaling about 15,000 sq. ft., for the establishment of a local plant. Initial operations will be devoted to assembling work. It is said that additional units will be established in the near future.

Parke, Davis & Co., 2951 Atwater Street, Detroit, will make extensions and improvements in its power house, estimated to cost about $45,000.

Dodge Brothers, Inc., Detroit, has acquired about 7½

acres at Windsor, Ont., for a new branch plant for Canadian business. Plans are under way for construction of the initial buildings.

The National Portland Cement Co., Mount Pleasant, Mich., will commence the immediate erection of its new plant at Coldwater Lake, estimated to cost about $500,000, with machinery. A. E. Gorham, 119 South Normal Street, is president.

The Wisconsin Public Service Co., 559 Marshall Street, Milwaukee, is completing plans for an addition to its electric power plant at Menominee, Mich., including line extensions, estimated to cost in excess of $100,000. Mead & Seastone, State Street, Madison, Wis., are engineers. J. P. Pulliam is secretary.

The Consumers' Power Co., Grand Rapids, Mich., has plans under way for extensions and improvements, including new steam turbines and auxiliary operating machinery, underground conduit lines, etc., estimated to cost close to $1,000,000.

The Pere Marquette Railroad Co., Fort Street, Detroit, has awarded contract to the Arnold Co., 105 South LaSalle Street, Chicago, Ill., for new shops and other buildings at its Wyoming Street yard, Grand Rapids, Mich., estimated to cost about $1,000,000, including equipment. Work will be placed under way at once.

The Michigan Gas & Electric Co., Three Rivers, Mich., is completing plans for a new one-story power house, estimated to cost about $45,000. P. Simmons is general manager.

The Four Wheel Hydraulic Brake Co., 708 Harper Avenue, Detroit is arranging a list of equipment for installation in an addition.

The Central South

ST. LOUIS, July 31.

The City Council, St. Joseph, Mo., is planning for extensions and improvements in the municipal electric light and power house, estimated to cost about $300,000, including machinery.

The Treasury Department, office of the supervising architect, Washington, is taking bids until Aug. 15 for an electric-driven turbine pump for installation at the post office, St. Louis.

The Union Electric Light & Power Co., St. Louis, is perfecting plans for reorganization, to include the issuance of $60,000,000 of new stock, a portion of the fund to be used for extensions and improvements. It is proposed to build an addition to the main generating plant and to erect a new power plant in the East Side section. Louis H. Egan is president.

The Doniphan Light, Ice & Power Co., Doniphan, Mo., S. C. Danner, P. O. Box No. 213, president, has plans in progress for a new cold storage and refrigerating plant.

The City Engineering Department, Louisville, has made application for permission to build a municipal hydroelectric generating plant at the United States Lock and Dam, Louisville Falls, Ohio River, Louisville.

The W. R. Martin Co., Louisville, operating a machine shop, is arranging for enlargements, to include the equipment of a new forge shop.

A vocational department will be installed in the new two-story and basement junior high school, 123 x 175 ft., to be erected at Owensboro, Ky., estimated to cost about $250,000.

The Oklahoma Gas & Electric Co., Oklahoma City, Okla., has disposed of a bond issue of $500,000, a portion of the proceeds to be used for extensions and improvements in plant and system.

A vocational department will be installed in the new three-story high school to be erected at Enid, Okla., 110 x 145 ft., to be known as the Kenwood Junior High School, estimated to cost about $125,000; and in the new Garfield Junior High School, two stories to cost about $90,000, at the same place. Bids for both buildings were rejected recently, and new bids have been asked. R. W. Shaw, Beck Building, is architect.

The Molybdenum Co. of America, 1008 Empire Building, Pittsburgh, is planning the erection of new hydroelectric generating plants on the Red River and Columbine Creek, Taos County, N. M. The company is also arranging for the establishment of new production plants in this section.

The Central Paper Box Co., 2935 Belleview Avenue, Kansas City, Mo., has awarded contract to the Sofus & Sorenson Construction Co., 2701 East Thirty-first Street, for a two-story and basement plant, 126 x 153 ft., on Belleview Avenue, estimated to cost in excess of $50,000, including equipment.

The Memphis Sash & Door Co., 673 South Dudley Street, Memphis, Tenn., has acquired property at Railroad Street and Roland Avenue, and plans the erection of a three-story factory, 200 x 300 ft.

W. A. McGuire, Horse Cave, Ky., is organizing a company to build and operate a cold storage and refrigerating plant.

Fire, July 18, destroyed a portion of the general plant, including steel tankage department, etc., of the Prairie Pipe Line Co., Jenks, Okla., with loss approximating $100,000. It is said that the plant will be rebuilt.

C. T. Dana, 1505 Del Norte Avenue, St. Louis, is organizing a company to build and operate a hydroelectric power plant on the Black River, estimated to cost close to $500,000. It will have an initial capacity of 2000 kw. Fuller & Beard, Chemical Building, St. Louis, are engineers.

The Missouri Lumber Co., Hot Springs, Ark., has plans under way to rebuild its plant, destroyed by fire with loss estimated at $75,000, including machinery. The new mill will cost approximately a like amount.

A vocational department will be installed in the new two-story and basement central high school, 140 x 170 ft., to be erected at Bowling Green, Ky., estimated to cost about $100,000. Clifford B. Shopbell & Co., Evansville, Ind., are architects.

The Green Light & Power Co., Pleasant Hill, Mo., is concluding arrangements for the purchase of an existing power plant and system at Warrensburg, Mo. Plans are under way for extensions and improvements.

The Caddo River Lumber Co., Glenwood, Ark., is planning for the early installation of machinery and electric equipment in its new saw mill, construction for which is under way. It is estimated to cost in excess of $50,000, and is expected to be ready for operation in September.

A vocational department will be installed in the two-story high school to be erected at Eufaula, Okla., estimated to cost about $75,000, for which bids on a general contract are being received until Aug. 24. Jewel Hicks, West Main Street, Oklahoma City, Okla., is architect.

The Gulf States

BIRMINGHAM, July 31.

The Magnolia Petroleum Co., Dallas, Tex., will build a new central repair plant at Electra, Tex., for machinery and parts manufacture. It will comprise a one-story machine shop, 40 x 112 ft.; one-story forge shop, 60 x 140 ft.; boiler shop, 40 x 80 ft.; pipe and machine shop, 40 x 60 ft.; automobile repair shops, warehouses and other buildings. It is estimated to cost about $250,000, with machinery. The company is also contemplating the erection of a new ice-manufacturing plant. A tract, 500 x 1000 ft., will be used for the works and other buildings added later.

The Board of Directors, University of Texas, Austin, Tex., has had plans prepared for a new power house at Galveston, Tex.

The Richardson Co., Monroe, La., manufacturer of roofing products, has awarded contract to the Austin Co., Cleveland, for the initial unit of a new plant, comprising a two-story factory, 30 x 300 ft. Other buildings will be erected later, making the entire plant cost close to $700,000.

The Consolidated Ice Co., Monroe, La., will commence the immediate erection of a new ice-manufacturing plant.

Fire, July 19, destroyed the engine house and shop buildings of the Texas & Pacific Railroad, El Paso, Tex., with loss reported in excess of $200,000, including equipment.

J. E. Adams and E. W. Gough, Sebring, Fla., have acquired a local building and will establish a machine and repair shop, primarily for automobile work. A list of equipment is being arranged.

Plans are being prepared for the erection of three fertilizer plants at Tampa, Fla., estimated to cost in excess of $300,000, including machinery. The factories will be built by companies recently organized, including the Melville Fertilizer Co., Tampa, capitalized at $1,000,000, Herbert M. Benker, president; the Dundee Fertilizer Co., Winter Haven, Fla., capitalized at $250,000, W. T. Overstreet, president; and the Cape Fear Fertilizer Co., Fayetteville, N. C., operating with a capital of $1,500,000.

The Shreveport Brick & Tile Co., Shreveport, La., has acquired property on Douglas Island, for a new plant, equipped for a production of about 900,000 bricks per month. The company has a tract of 100 acres. J. W. Peyton is president.

Smoak & Goin, Ocala, Fla., have plans under way for the establishment of a new plant on property recently acquired on Orange Street, for the manufacture of motor truck bodies.

The West Florida Power Co., Tallahassee, Fla., is perfecting plans for a new hydroelectric generating plant on the Ocklockonee River, estimated to cost close to $1,000,000, including equipment.

The Oak Lawn Ice & Cold Storage Co., Dallas, Tex.,

has plans under consideration for a new ice-manufacturing plant at Gertrude Street and Cole Avenue.

A vocational department will be installed in the high school to be erected by the East Baton Rouge Parish School Board, East Baton Rouge, La. Preliminary plans are under way. R. C. Gordon is president.

The City Council, Corinth, Miss., is arranging for a bond issue of $100,000, the proceeds to be used for the erection of a municipal electric light and power plant. Fuller & Beard, Chemical Building, St. Louis, are consulting engineers.

The Chalmette Petroleum Corporation, New Orleans, formed by a recent merger of the Chalmette Oil Refining Co., and the Louisiana Oil Exporting Co., capitalized at $1,000,000, has plans under way for enlargements in its oil refinery, to include the installation of new machinery.

The Ballinger Compress Co., Ballinger, Tex., will make extensions and improvements in its cotton compress plant, including the installation of additional equipment at the power house.

The Humble Oil Refining Co., and the Pierce Oil Co., Laredo, Tex., are planning to rebuild the portions of their plants destroyed by fire July 20, with combined loss estimated in excess of $100,000.

The Stedman Fruit Co., Beaumont, Tex., will commence the immediate erection of a new refrigerating and cold storage plant, estimated to cost in excess of $150,000 with equipment.

Traveling cranes, freight handling and conveying machinery, etc., will be installed at the Tampa; Fla., harbor, in connection with wharf and dock extensions and improvements to be made by the city, estimated to cost about $600,000. A. D. Hall is city manager in charge.

Indiana

INDIANAPOLIS, July 31.

The Paramount Wheel & Engineering Co., Hartford City, Ind., now being organized with a capital of $300,000, has concluded arrangements with the Chamber of Commerce for a site for the erection of its new plant to manufacture metal automobile wheels and other automotive products. The initial works is estimated to cost in excess of $100,000, including machinery, and will give employment to about 200.

The Board of County Commissioners, Lawrenceburg, Ind., has completed plans for an electric power house at the County infirmary. Bids on a general contract are being asked until Aug. 7.

The Concealed Door Check Co., Kokomo, Ind., recently organized, will operate a local plant for the manufacture of a special door check and other hardware specialties. J. C. Patten is president, and Floyd W. Eastman, secretary and general manager.

The Modern Brass Foundry, 1319 Bates Street, Indianapolis, is planning to rebuild its furnace room, partially destroyed by fire, July 25.

The Indiana & Michigan Electric Co., 220 West Colfax Avenue, South Bend, Ind., has applied for permission to construct and operate a hydroelectric power plant on the St. Joseph River, Berrien County, Mich. F. A. Bryan is in charge.

The Hercules Corporation, Evansville, Ind., manufacturer of wagons, gas engines, etc., is arranging to devote a portion of its plant to the manufacture of refrigerators and refrigerating apparatus.

The National Malleable Castings Co., Halmes Avenue and Michigan Street, Indianapolis, will rebuild the portion of its plant, destroyed by fire July 21.

A vocational department will be installed in the new senior and junior high school to be erected at Plymouth, Ind., two stories, 163 x 179 ft., estimated to cost about $300,000, for which bids on a general contract are being received until Aug. 7. Ernest W. Young, Dean Building, South Bend, Ind., is architect.

The Pacific Coast

SAN FRANCISCO, July 25.

The General Electric Co., Rialto Building, San Francisco, Cal., has awarded contract to the Foundation Co., Holbrook Building, for a new one and two-story plant at East Fourteenth Avenue and Fifty-fourth Street, Oakland, 132 x 235 ft., estimated to cost $200,000 with equipment.

The Los Angeles Railway Co., Pacific Electric Building, Los Angeles, has had plans prepared for a new car repair shop, aggregating about 94,500 sq. ft. and estimated to cost approximately $140,000. The engineering department of the company is in charge.

The Snow Mountain Water & Power Co., 216 Pine Street, San Francisco, has applied for permission to construct two hydroelectric power plants on the Middle Eel River, Mendocino County. Each plant will have a capacity of close to 12,000 hp., and the project is estimated to cost approximately $10,000,000.

The Royal Motor Accessory & Mfg. Co., Sawtelle, Cal., has completed plans for new works at Sawtelle and Pico Boulevards to manufacture automobile equipment. It has a tract of about 3 acres. The initial plant will cost approximately $100,000 with equipment. H. C. Cove is president.

The Star Motor Co. of California, Oakland, Cal., a subsidiary of the Durant Motor Co., with local plant on East Fourteenth Street, has awarded contract to the P. J. Walker Co., Monadnock Building, San Francisco, for two buildings to comprise the initial units of its new plant. The structures will be 100 x 200 ft., and 80 x 150 ft., respectively. The entire plant is estimated to cost in excess of $750,000.

The Pacific Coast Borax Co., Kohl Building, San Francisco, has acquired the property of the Chandler Shipbuilding Co. at San Pedro Harbor, Los Angeles, comprising about 10 acres, as a site for a new refinery to cost about $1,000,000, including machinery. The works will include a power house, machine shop and other mechanical buildings, and will require crushing, mixing, conveying machinery, etc. C. B. Zabriskie is president.

The Butte Meadows Co., Chico, Cal., has applied for permission to construct and operate a hydroelectric power plant on Butte Creek, estimated to cost approximately $40,000.

The Coy Valve Co., Chehalis, Wash., recently organized with a capital of $500,000, is selecting a site for the erection of a plant to manufacture valves and other specialties.

The Seattle Chain & Mfg. Co., Seattle, Wash., is arranging for a lease of property from the City Industrial Bureau, as a site for a new plant.

The E. K. Wood Lumber Co., Anacortes, Wash., has acquired about 420 acres as a site for the erection of a lumber mill. All departments will be electrically-operated. Traveling cranes and kindred equipment will be installed on loading docks, which will be constructed in connection with the plant.

W. W. Rosebraugh, Salem, Ore., has plans under way for rebuilding his machine shop, foundry and boiler works, at Seventeenth and Oak streets, recently destroyed by fire.

Vocational departments will be installed in the proposed two high schools to be constructed at Portland, Ore., estimated to cost close to $2,000,000.

Canada

TORONTO, July 31.

LOCAL dealers state that inquiries for many lines of equipment are being received which portend considerable activity around September or October. Canadian equipment manufacturers generally are quite actively engaged and in the past few weeks several have increased their working forces to cope with the orders on their books. In most cases, however, the demand for equipment is confined to one or two machines, with only a small amount of business coming out for larger sized orders.

The automotive industry is buying steadily and dealers state that it is a very poor week when they cannot sell a machine or tool to some of the leading automobile manufacturers in Ontario. A better demand is also springing up for equipment for replacement purposes, and manufacturers who have been putting off entering the market for some special machine now find that they can wait no longer. Small tools are moving briskly, with users entering the market both for spot and future deliveries.

The Ontario Steel Products Co., Ltd., Gananoque, Ont., proposes to spend about $60,000 on new machinery and equipment this year.

The Ford Motor Co. of Canada will commence building operations on the proposed $6,000,000 plant at Ford, Ont., within two weeks. The first building will be 400 x 1300 ft., and will be an extension to the present works. It is expected to be completed by January. It has also secured a site on Danforth Avenue, just outside the city limits of Toronto, and is preparing to establish a plant to cost about $1,000,000. The company is asking for sewage and water service from the city.

The Canadian National Railways are erecting a roundhouse and other buildings for complete divisional point

facilities near Fort William, Ont., to cost $250,000. H. A. Dixon, Winnipeg, Man., is chief engineer.

The Canadian Pacific Railway will build an engine house at Medicine Hat, Alta., to cost $30,000.

The Taylor Rubber Co., Ltd., 37 Richmond Street East, Toronto, will build a factory at Aurora, Ont., to manufacture automobile tubes.

The Sydenham Brick & Tile Co., Ltd., Wallaceburg, Ont., will build an addition to its plant to cost about $30,000. E. C. Morse is general manager.

S. L. Lambert, Welland, Ont., will rebuild his sawmill, recently destroyed by fire, and is interested in prices of equipment.

The Milton Pressed Brick Co., Milton, Ont., will spend $10,000 on construction of kiln and other improvements.

C. N. Tingle, Hanna, Alta., is receiving bids for the erection of a power plant.

The Alberta Hydro-Electric Co., Calgary, Alta., proposes to build a hydroelectric plant on the Bow River, to consist of four dams, the first of which will cost $500,000.

E. B. Reed, who recently severed his connection with Maguire, Patterson & Palmer, Ltd., match manufacturer, has leased a section of the building of the Pembroke Iron Works, Pembroke, Ont., and with three local associates will establish a plant for the manufacture of veneer, panels and plywood. The machinery has been purchased.

BOOK REVIEWS

Official Report of the Ninth National Foreign Trade Convention. Issued by the secretary, O. K. Davis, National Foreign Trade Convention headquarters, New York. Pages, 621, 6 x 9 in. Price, $2.50.

This report and its predecessors, which give the addresses made at the annual conventions under the auspices of the National Foreign Trade Council, together with a stenotype report of the proceedings, including discussions at the various group sessions, have come to be in a real sense text books of American foreign trade. One who has been to any extent a reader of them has not missed the evolution in literature of this sort. In earlier foreign trade convention days the discussions brought out a good many hackneyed observations. There was a good deal of sameness in the advice given as to what to do and what not to do in trying to trade with people of other countries. Makers of speeches of the old kind have disappeared from the floors of the convention and the group meetings, and in more recent years we have had the experiences of men fresh from foreign fields and of sales managers at home who have been willing to give others the results of their own successful methods and their latest contacts with resourceful salesmen in other lands.

Conditions due to the war have compelled some very hard thinking on the part of our exporting manufacturers. They have had to take new steps without the guidance of experience. The past two years in particular have been trying ones, and a sifting process has been going on which has separated the opportunists in export trade from those who years ago set about the development of foreign business with a purpose of standing by it through thick and thin.

The Philadelphia convention of May, 1922, with which the present volume deals, shows better than any other the result of the seasoning process. The speakers were well selected and knew whereof they spoke. There was probably a smaller admixture of academic theorizing than at any of the eight conventions that precedes it. Of particular interest are the sections dealing with market conditions abroad, the American merchant marine, our foreign loan policy, the exchange situation, export sale, promotion, and public education for greater foreign trade.

Industrial Furnaces, published by the Chapman-Stein Furnace Co., Mt. Vernon, Ohio, is a series of bulletins bound together, describing recuperative furnaces in general and those specifically for use in rolling mills and for annealing. The furnace of the Chapman-Stein company is built under patents held by Charles M. Stein of the Societe Anonyme des Appareils de Manutention et Fours Stein, Paris, France. It is explained that the advantage of a recuperative furnace is that it will preheat all the air required for combustion to a temperature about 250 to 350 deg. Fahr. less than the temperature of the spent furnace gases entering the recuperator. It is also pointed out that the recuperative furnace is not suited to conditions which demand a large overload capacity, under such requirements the regenerative furnace being called for, with its large number of checkers for storing heat. The recuperative furnace uses thin tile, comparatively light in weight, designed to transfer heat rather than to store it. Hence it is not suited to open-hearth furnaces, large glass melting tanks and large forge furnaces which heat ingots over 5 tons or more than 32 in. in diameter. The distinctive feature claimed for the Stein furnace is that the recuperator air ducts are vertical and have no turns or off-sets.

A standard code regulating the installation of warm air furnaces in residences has been compiled under the guidance of the American Society of Heating and Ventilating Engineers, the National Warm Air Heating and Ventilating Association, the National Association of Sheet Metal Contractors and the Western Warm Air Furnace and Supply Association. The code, which is in small pamphlet form, shows that considerable engineering thought has been given to warm air furnace installation with the object of taking it from the field of careless rule of thumb application. The present draft has not yet been approved by all of the four associations, but those interested could probably obtain a copy by applying to any one of the four associations named.

New Books Received

The International Molders Union of North America. By Frank T. Stockton, Ph.D., Professor of Economics, University of South Dakota. Pages, 234, 6¼ x 9½ in. Published by the Johns Hopkins Press (in series of Johns Hopkins University Studies in Historical and Political Science), Baltimore. Price, $1.50.

The Analysis of Non-Ferrous Alloys. By Fred Ibbotson and Leslie Aitchison. Pages 246, 5½ by 8½ in.; illustrations, 21. Published by Longmans, Green & Co., 55 Fifth Avenue, New York. Price, $4.

Machine Tool Operation. Part II. By Henry D. Burghardt. Pages 438, 4¾ x 7½ in.; illustrations, 298. Published by the McGraw-Hill Book Co., Inc., 370 Seventh Avenue, New York. Price, $2.75.

Production Engineering and Cost Keeping. By William R. Bassett and Johnson Heywood. Pages 311, 6 x 9 in.; illustrations, 115. Published by the McGraw-Hill Book Co., Inc., 370 Seventh Avenue, New York. Price, $3.50.

Hütte—Taschenbuch für Eisenhüttenleute. Compiled by Akademischer Verein Hütte, Berlin. Pages 982, 5 x 7½ in.; illustrations, 511. Published by Wilhelm Ernst & Sohn, Berlin, Germany. Price, 738 marks.

Report on Productive Industries, Railways, Taxes and Assessments, Waterways and Miscellaneous Statistics. Compiled for Commonwealth of Pennsylvania for 1920. Pages 1040, 5¾ x 9 in. Published by J. L. L. Kuhn, printer to the Commonwealth, Harrisburg, Pa.

The Gantt Chart. By Wallace Clark. Pages 155, 6 x 8½ in.; illustrations, 37. Published by the Ronald Press Co., 20 Vesey Street, New York, Price, $2.50.

Industrial Unionism in America. By Marion Dutton Savage. Pages 344, 5 x 7½ in. Published by the Ronald Press Co., 20 Vesey Street, New York. Price, $2.25.

The Peril of the Republic. By Daniel Chauncey Brewer. Pages 354, 5 x 7¾ in. Published by G. P. Putnam's Sons, 2 West Forty-fifth Street, New York. Price, $1.75.

NEW TRADE PUBLICATIONS

Centrifugal Pump Guide.—Allis-Chalmers Mfg. Co., Milwaukee. A 4-page monthly bulletin listing the Allis-Chalmers pumping units ready for immediate shipment.

Ash Handling.—Conveyors Corporation of America, 326 West Madison Street, Chicago. A 12-page 8½ in. x 4 in. booklet illustrating and describing the American steam jet ash conveyor, by means of which ashes are drawn by suction and then propelled through a discharge pipe line to the collecting point.

American-Made Drawing Instruments.—The C. F. Pease Co., 813-21 North Franklin Street, Chicago. A 16-page illustrated catalog showing detail of instruments and sets manufactured in Chicago, and adapted to professional drafting service.

Power Transmission Machinery.—Hill Clutch Co., Cleveland. Four-page leaflet describing an installation of Hill clutches at the Eddy Paper Mills, Three Rivers, Mich.

Adjustable Limit Snap Gage.—Meldrum-Gabrielson Corporation, Syracuse, N. Y. A 12-page booklet, 7½ x 4 in., cataloging, illustrating and describing the Syracuse gage for use in accurate machining of duplicate parts.

Fire Tools, Hooks, Etc.—Leetonia Tool Co., Leetonia, Ohio. Pages 72A and 72B for loose-leaf catalog No. 3.

Radiation Pyrometers.—Thwing Instrument Co., 3339 Lancaster Avenue, Philadelphia. A 16-page bulletin (No. 11) illustrating and describing the indicating and multiple-recording types of radiation pyrometers designed by Dr. C. B. Thwing, president of the company. The theory of operation is explained.

Chain Furnace Screens.—E. J. Codd Co., 700 South Caroline Street, Baltimore. An 8-page bulletin showing the use of the Wiegan patented chain screen door on furnaces, ovens, cupolas, electric furnaces, kilns, boiler fires, etc. The curtain of strands of steel chains give a view of the furnace interior and do not interfere with the passage of the charge or the manipulating tools.

Optical Pyrometer.—Scientific Materials Co., Pittsburgh. A 16-page 6 in. x 9 in. illustrated booklet giving technical data on the theory, design and operation of the F. & F. pyrometer.

Forging and Heating Furnaces.—Bulletin No. 241, W. S. Rockwell Co., 50 Church Street, New York, with 26 illustrations on 12 pages, describes many types of furnaces for forging work and heating steel and other materials. A discussion is included, on the need for better heating in forging and forming practice.

Level and Transit.—Warren-Knight Co., 136 North Twelfth Street, Philadelphia. An illustrated circular devoted to the Sterling combination level and transit, an instrument which may be used either as a level or as a transit without the use of detachable parts.

Precision Measuring Tools.—Van Keuren Co., 362 Chambers Street, Boston. Catalog, illustrative and descriptive with prices, of combination precision gage blocks, gage block accessories, plug gages, measuring wires for screw threads and profile gages, surface plates and light waves measuring outfits.

Sprague Electric Dynamometer Chassis Test System.—An 8-page leaflet issued by the Sprague Electric Works, 524 West Thirty-fourth Street, New York. This describes, with the aid of eight photographs, a testing system for cars at speeds up to 60 miles per hour. During the test the car is stationary upon the test block, but the wheels are revolving at that speed. The system is recommended for the manufacturer to tune up a car into condition before shipment and for the service station to put customers' cars in good shape on the basis of actual performance under load.

Toledo Drop Hammers and Trimming and Forging Presses.—A 64-page catalog issued by the Toledo Machine & Tool Co., Toledo, Ohio. This is section 9-A of Catalog No. 11. It describes and illustrates a large number of hammers and presses and gives much in the way of particulars of dimensions, capacities, etc., in tables. The data given in the tables is unusually complete. The tools covered include board lift drop hammers, bench drop hammers, drop hammers, trimming presses, trimming and forging presses and forging presses.

Plans of New Companies

[No news in regard to new incorporations is published in THE IRON AGE until it has been investigated by correspondence or by personal call.]

The Schmidgall Tool Co., 617 Lincoln Avenue, Peoria, Ill., recently incorporated with capital stock of $10,000, will manufacture all kinds of cutting tools, wire and iron specialties such as bank cages, fences, gates, etc., but will specialize on granite and stone cutters' tools. The company has a small shop which will answer its present requirements, but is in the market for a 200-lb. drop hammer. Officers are Carl H. Schmidgall, president; Lester R. Renegar, vice-president; Roy A. Breymeier, secretary-treasurer.

The Perfection Radio Laboratory, Clinton, Iowa, of which H. L. Bailey is secretary and general manager, has been incorporated. Plans are under way for the construction of a factory building within the near future and later on the company will be in the market for screw machines, punches, etc. Various types of radio apparatus and parts will be manufactured.

The Motor Parts Machine Co., 815 East Pike Street, Seattle, Wash., which has been engaged in crankshaft and cylinder grinding for some time, has been incorporated. Manufacture of automobile parts, particularly pistons and piston pins, is under way and later on the company may be in the market for additional shop equipment.

The Sterling Wire Machinery Co., Sterling, Ill., recently incorporated with capital stock of $25,000, will sell wire-working machinery which it will have built on contract.

The Lloyd Engineering Co., 241 Cortlandt Street, New York, incorporated to do all kinds of blower and sheet metal work, has a fully equipped shop for making all kinds of sheet metal products, and does not propose to expand at present. Officers: E. M. Lloyd, J. E. Wells and U. Lloyd.

The Hartman Brake Corporation, New York, has been incorporated with a capital of $300,000, to manufacture brakes, brake bands, etc. Incorporators: T. F. Thornton, E. S. Wolbarst and J. P. H. Rieper. Plans for manufacturing are still pending. Feiner & Maass, 66 Pine Street, New York, represent the corporation.

The Wright Radio Corporation, New York, has been chartered under state laws to manufacture wireless equipment. Incorporators: C. W. Irwin, T. M. Smith and J. A. Delany. Plans for manufacturing are undecided. Address G. P. Breckenridge, 7 Dey Street, N. Y.

The Michigan Motor Specialties Corporation, foot of Mt. Elliott Avenue, Detroit, has been incorporated to take over the assets of a bankrupt company of the same name, which were sold at public auction recently. The new company will continue to manufacture the same line of automobile parts, screw machine work, stampings, including some patented oil-can holders, priming cups, etc., which were manufactured by its predecessor. The company does not contemplate purchasing additional shop equipment at this time. Officers of the new company are M. Mitshkun, president and treasurer; Charles W. Beck, vice-president; Charles W. Beck, Jr., secretary and general manager.

The Trippe Reflector Corporation, 600 Hartford Building, Chicago, has been organized and incorporated to produce an automobile reflector, which at first will be manufactured under contract. Graham Trippe is president.

The Standard Castings Co., South Bend, Ind., has been incorporated to manufacture aluminum castings. The company already has its own plant fully equipped. John M. Zigler is treasurer.

The Eureka Machine Works, Eureka, Kan., has recently opened a shop in the Kansas oil fields for the manufacture and repair of tools and materials used in this work such as drills, stems, pins, boxes, pipe threading, welding and other classes of smithing and machine work. Huffman & Boyersmith are the proprietors.

The Wood-Reinecke Electric Co., Louisville, Ky., incorporated several weeks ago with a capital of $30,000, will do a distributing and jobbing business and will not, for the present, engage in manufacturing. It is ordering a complete line of electric supplies.

The Perfection Radio Laboratories, Inc., Clinton, Iowa, recently incorporated with a capital of $1,000,000 to manufacture radio equipment, has received large orders and has found expansion necessary. Ground is being acquired and preparations made to erect a plant. Incorporators: F. M. Bailey, M. S. Ackles, H. L. Bailey and D. I. Bailey.

The C. & C. Appliance Corporation has been incorporated with a capital stock of $50,000, to manufacture and exploit four products patented by one of the incorporators, D. O. Cloud, and to be known as an electric automatic hammer, a pipe hanger and two accessories. A contract has been awarded for making the hanger, but bids are open for

manufacturing the other products. Address D. O. Cloud, 48 West Broadway, New York.

The Multi-Needle Engineering Corporation, Brooklyn, N. Y., has been incorporated with a capital of $10,000, to manufacture steel needles and kindred specialties. Incorporators: A. J. Hugger, and H. N. Hulander. It has taken over the Multi-Needle Machine Co., and is ready to manufacture. Address H. R. Berlinicke, 160 Broadway, New York.

The Schofield Mfg. Co., New York, has been incorporated with a capital of $50,000, to manufacture hardware products. Incorporators: J. Bramwell, A. P. Anderson, and F. W. Oberkirch. It is in the process of organization, but does not propose temporarily to build, since it is manufacturing under contract. Address Davis, Wagner, Heater & Holton, 34 Nassau Street, New York.

Miranda Brothers, Inc., 132 Nassau Street, New York, has been chartered under state laws to manufacture motors and engines. Incorporators: I. J. Miranda, Jr., L. Drecher and B. B. Smith. No manufacturing is being done at present, however, the company merely acting in the capacity of export department for the Driggs Ordnance & Mfg. Co the Mercer Motor Car Co. and the Commerce Motor Car Co

The Aviation Syndicate, Inc., New York, has been incorporated with a $150,000 capital with wide powers including the manufacture of airplanes and parts. H. Barber, 30 East Forty-second Street, New York, is the chief incorporator. Its immediate object is to act as a parent company for an air transport concern to be established soon. The operating companies under this parent will do some manufacturing through contract of products relating to aircraft. Among these are all-steel hangars, radio stations and some aircraft.

IRON AND INDUSTRIAL STOCKS

Backed and Filled Past Week with a Negligible Net Result

Prices of iron and industrial stocks and bonds have backed and filled the past week with a negligible net result. Day to day domestic and foreign economic developments proved conflicting. The ease of money is regarded as a factor in helping industry to weather the railroad and coal strikes. Buying power of the Western section of the country has been lessened by declining grain values, while that of the South has increased due to the appreciation in cotton values. Failures the country over are remarkably unimportant.

The range of prices on active iron and industrial stocks from Monday of last week to Monday of this week was as follows:

Allis-Chalm.	51¾- 54½	Inland Steel	52¾- 53¾
Allis-Chalm. pf.	98 - 98½	Int. Har.	103 -103½
Am. B. S. & F.	63⅞- 65	Lack. Steel	76⅞- 79¾
Am. B. S. & F. pf.	-108	Lima Loco.	105¾-109⅝
Am. Can	55½- 59⅞	Midvale Steel	34½- 37⅛
Am. Can pf.	109 -109½	Nat.-Acme	17 - 17½
Am. Car & F.	166 -172½	Nat. E. & Stm.	53⅜- 56¼
Am. Car & F. pf.	-120¾	N. Y. Air Brake	78½- 80½
Am. Loco.	113½-119¾	Nova Scotia Steel	- 31
Am. Loco. pf.	117 -117¼	Otis Steel	11 - 12
Am. Stl. Fdries.	36½- 38	Pressed Steel	79 - 82½
Am. Radiator.	96 -101	Ry. Stl. Spring	105 -108¾
Am. Steel F. pf.	- 99⅝	Ry. Stl. Sprg. pf.	-114½
Bald. Loco.	115¾-120¾	Replogle Steel	31¼- 34
Beth. Steel	74 - 76	Republic	71¼- 74⅞
Beth. Stl. Cl. B.	75¾- 79	Republic pf	92½- 92⅞
Beth. Stl. 8% pf.	113 -114½	Sloss	45 - 46
Brier Hill	- 18	Steel of Canada	72½- 74⅝
Br. Em. Steel	- 10½	Superior Steel	- 32
Br. E. Stl. 1st pf	- 73	Trans.-Williams	37½- 38
Br. E. Stl. 2d pf.	30 - 30½	Un. Alloy Steel	39 - 39½
Chic. Pneu. Tool	69⅞- 71⅝	U. S. Pipe	32¾- 35⅜
Colo. Fuel	30 - 31	U. S. Pipe pf.	68 - 72½
Cruc. Steel	81½- 91⅝	U. S. Steel	99½-101⅜
Cruc. Steel pf.	92½- 93½	U. S. Steel pf.	120 -121¼
Dom. Steel	32 - 32¼	Vanadium Steel	45 - 50½
Gen. Electric	174 -182	Va. I. C. & C.	- 48
Gt. No. Ore. Cert.	39 - 40¼	W'house E. & M.	59¾- 62½
Gulf States Steel	79 - 85½		

Industrial Finances

Under the terms of the proposed Republic-Midvale-Inland steel merger, the Midvale stockholders are to receive for each share of the holdings 75 per cent of stock of the North American Steel, and 25 per cent of stock of a new company to be formed to take over and operate the Nicetown plant owned by the Midvale Steel & Ordnance Co.

The Remington Cutlery Works, Inc., Bridgeport, Conn., incorporated May 15, last, has increased its capital stock from $25,000 to $1,500,000.

At a special meeting of the stockholders of the Southern Coal & Iron Corporation called for Aug. 14 the proposed increase of its stock from $1,500,000 to $3,000,000 will be voted on.

The Lima Locomotive Works, Inc., shows in its 1921 report a gross income of $12,528,154; operating income, $2,112,005; net earnings after Federal taxes, etc., $1,136,591, and a surplus after dividends of $631,541. The Dec. 31 balance sheet shows cash on hand or in banks $873,644, and a surplus of $2,470,993.

The Penn Seaboard Steel Corporation reports for the first half of 1922 net sales of $834,470; working profits, $49,281; deficit after selling and administration expenses, $90,290, and a deficit after interest charges, etc. of $399,963.

The profits of the Ontario Steel Products Co., Ltd., Gananoque, Ont., for the year ended June 30, 1922, amounted to $141,083, a decrease of $81,362, from the level established in the previous year. The amount of $59,802 was written off for depreciation, a sum greater than a year ago by over $29,000. The net profits were $81,282, which with the $564,087 brought forward from the previous year, gave a total of $645,369 for distribution. Bond interest consumed $30,222. The regular dividend of 7 per cent was paid on the preferred stock, amounting to $52,500. Two per cent quarterly was paid on the common shares in August and November, 1921 and one per cent in February, 1922, these payments calling in the aggregate for $37,500. At the meeting of directors held last April, it was decided, on account of the uncertain business condition, to suspend further payments of dividends on the common shares. The directors have authorized the expenditure of approximately $60,000 during the coming year for the installation of modern and improved methods of manufacture.

The Chicago Pneumatic Tool Co. for the six months ended with June, reports earnings of $258,477. After deducting a reserve of $111,604 for depreciation and contingencies there was a net profit of $146,873.

Pursuant to resolutions of directors adopted July 21, 100,000 additional shares of the Penn Seaboard Steel Co. stock have been authorized to be issued for cash. The proceeds derived from the sale of this stock will be used to reduce current liabilities and to provide additional working capital.

The plant and all other assets of the New Process Gear Corporation, Syracuse, N. Y., with a value estimated at $3,000,000, will be sold there by Mayor George R. Lunn, of Schenectady, and Francis G. Gaffey, of New York, as special masters, at noon August 22. This sale will complete the liquidation of the Willys Corporation, of which the New Process Gear Corporation was a subsidiary, as far as physical properties are concerned.

Trade Changes

The Connecticut Electric Steel Co., Inc., Hartford, Conn., at a meeting held recently, voted to dissolve. Claims against the company should be sent to Day & Berry, 750 Main Street, Hartford, Conn., attorneys for the directors acting as trustees.

The New England Structural Co., Everett, Mass., has leased quarters in the Massachusetts Trust Co. building, Denvonshire Street, Boston. The company formerly maintained offices on State Street, but relinquished these some months ago.

The National Carbon Co., Inc., has established finishing plants at 237 East Forty-first Street, New York, and at 560 West Congress Street, Chicago, to supplement the emergency department maintained for some time at the Cleveland factory. Both of these plants will carry stocks of Columbia carbon, graphite and metal graphite brushes, and all sizes equipped with special methods of finishing will be available.

The Chandler & Farquhar Co., Boston, hardware and machinists' supplies, has leased for a term of years the large store and basement at 256-260 Devonshire Street. The new quarters are served with a rear entrance from Federal Court off 121 Federal Street and include the entire chamber on the second floor of the building at 250-260 Devonshire Street, which forms a part of the group of buildings on Winthrop Square known as the Carter-Rice Building. The new quarters will give the company approximately 40 per cent more floor space than at present, with a main floor nearly three times as large as the one now occupied. Extensive alterations are to be made to the three floors for the occupancy of the Chandler & Farquhar Co. about the first of next year, when it will move from its present quarters 32-38 Federal Street, where it has been located for more than 28 years. With the alterations, the company will be provided with ample loading and unloading platform space, which has not been possible in the present location. The company will operate its own elevator service.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossbile to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

	Per Lb.
Bars:	
Refined iron bars, base price	2.73c.
Swedish bars, base price	7.00c.
Soft steel bars, base price	2.73c.
Hoops, base price	3.78c.
Bands, base price	3.38c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	2.83c.
Channels, angles and tees under 3 in. x ¼ in., base	2.73c.

Merchant Steel

	Per Lb.
Tire, 1½ x ⅛ in. and larger	2.73c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	2.83c.
Toe-calk, ½ x ⅝ in. and larger	3.50c.
Cold-rolled strip, soft and quarter hard	6.25c. to 7.25c.
Open-hearth spring steel	4.00c. to 6.00c.
Shafting and Screw Stock:	
Rounds	3.35c.
Squares, flats and hex	3.85c.
Standard cast steel, base price	12.00c.
Extra cast steel	17.00c.
Special cast steel	22.00c.

Tank Plates—Steel

¼ in. and heavier	2.83c.

Sheets

Blue Annealed

	Per Lb.
No. 10	3.78c.
No. 12	3.83c.
No. 14	3.88c.
No. 16	3.98c.

Box Annealed—Black

	Soft Steel C. R., One Pass, Per Lb.	Blued Stove Pipe Sheet, Per Lb.
Nos. 18 to 20	4.00c. to 4.30c.	.....
Nos. 22 and 24	4.05c. to 4.35c.	4.60c.
No. 26	4.10c. to 4.40c.	4.65c.
No. 28	4.20c. to 4.50c.	4.75c.
No. 30	4.45c. to 4.75c.	.....

No. 28 and lighter, 36 in. wide, 10c. higher

Galvanized

	Per Lb.
No. 14	4.30c. to 4.60c.
No. 16	4.45c. to 4.75c.
Nos. 18 and 20	4.60c. to 4.90c.
Nos. 22 and 24	4.75c. to 5.05c.
No. 26	4.90c. to 5.20c.
No. 27	5.05c. to 5.35c.
No. 28	5.20c. to 5.50c.
No. 30	5.70c. to 6.00c.

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
⅛ in. Butt..	—56	—40	¾ in. Butt..	—30	—13
¾ in. Butt..	—61	—47	1½ in. Butt..	—32	—15
1-3 in. Butt..	—63	—49	2 in. Lap....	—27	—10
3½-6 in. Lap.	—60	—46	2½-6 in. Lap.	—30	—15
7-8 in. Lap..	—56	—34	7-12 in. Lap.	—23	— 7
9-12 in. Lap.	—55	—33			

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	3.50c. to 3.75c.
Annealed soft	3.50c. to 3.75c.
Galvanized annealed	4.25c. to 4.50c.
Coppered basic	4.00c. to 4.25c.
Tinned soft Bessemer	5.50c. to 5.75c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	17¾c. to 18¼c.
High brass wire	18¼c. to 18½c.
Brass rod	16¼c. to 17¼c.
Brass tube, brazed	24⅝c. to 25½c.
Brass tube, seamless	21½c. to 22 c.
Copper tube, seamless	23 c. to 24 c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 21¾c. to 22¾c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20
IC	$10.00	$8.50
IX	11.50	10.00
IXX	13.00	11.25
IXXX	14.25	12.50
IXXXX	16.00	14.00

Coke—14-20	Primes	Wasters
80 lb.	$6.05	$5.80
90 lb.	6.15	5.90
100 lb.	6.25	6.00
IC	6.40	6.15
IX	7.40	7.15
IXX	8.40	8.15
IXXX	9.40	9.15
IXXXX	10.40	10.15

Terne Plates

8-lb. coating, 14 x 20

100 lb.	$7.00
IC	7.25
IX	7.50
Fire door stock	9.00

Tin

Straits, pig	35c.
Bar	42c. to 46c.

Copper

Lake ingot	15¼c.
Electrolytic	15 c.
Casting	14¾c.

Spelter and Sheet Zinc

Western spelter	8 c. to 8½c.
Sheet zinc, No. 9 base, casks	8¾c. open 9¼c.

Lead and Solder*

American pig lead	6¾c. to 7c.
Bar lead	8c. to 8½c.
Solder, ½ and ½ guaranteed	25c.
No. 1 solder	23½c.
Refined solder	20¼c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	75c.
Commercial grade, per lb	35c.
Grade D, per lb	25c.

Antimony

Asiatic	6½c. to 7c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb	25c. to 27c.

Old Metals

The market is stronger and business more active. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	11.75
Copper, heavy wire	11.25
Copper, light and bottoms	9.00
Brass, heavy	6.25
Brass, light	5.25
Heavy machine composition	8.50
No. 1 yellow brass turnings	6.50
No. 1 red brass or composition turnings	7.75
Lead, heavy	4.50
Lead, tea	3.50
Zinc	3.25

THE IRON AGE

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Steel Scrap in Cupola Iron Mixtures

Strength of the Product and the Percentages of Scrap— A Series of Experiments and the Results— Effect on Hardness

BY E. J. LOWRY*

A KNOWLEDGE of the properties bestowed on cupola cast iron by the addition of steel scrap to the mixtures is of fundamental importance when high strength castings are under consideration. In this article some of the more important characteristics of high-test irons are discussed when obtained under scientific methods of melting.

As a result of the term "semi-steel," the foundryman usually considers that any addition of steel scrap, varying from one per cent and upward, to the mixture will produce the strongest castings. It is not believed that the originator of this product had such a practice in mind when he placed it before the foundry world. Rather, it is felt that he had in mind a limited variation in the percentage of steel scrap to be used in obtaining the strongest iron for a given analysis. With this idea the term semi-steel was adopted and presented to the trade.

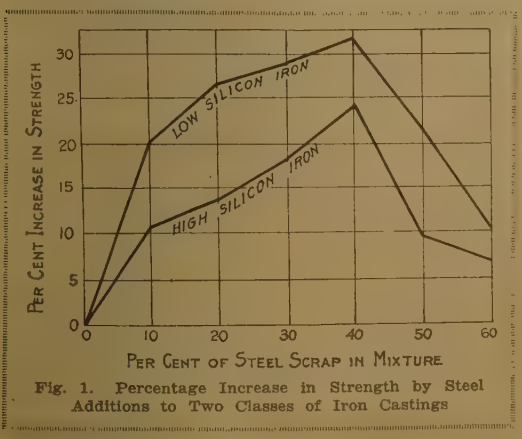


Fig. 1. Percentage Increase in Strength by Steel Additions to Two Classes of Iron Castings

From its inception there has been more or less debate as to the correctness of such a name. Some admirers have performed experiments to prove its worth; others have merely stated that high-test iron would be more correct. It is not within the province of this paper to present arguments either for or against. The trade names are accepted and used throughout the discussion without any bias.

The engineering professions, on learning that steel scrap added to the strength of cast iron, became hopeful of new applications for this material. Consequently, when cast iron was ordered the engineer demanded a semi-steel. This caused foundrymen to jump into the manufacture of this class of metal. The movement was without preparation and knowledge. As a result a heavy loss and many exceedingly poor castings were made. This caused the manufacturer as well as the consumer to look skeptically on the increase in strength of cast iron by the addition of steel scrap. Furthermore, some foundrymen learned to contend that such additions were injurious to their melt, while still others have gone to the exclusive manufacture of semi-steel castings.

Limitations on the Percentage of Scrap

From the foregoing, it is evident that there must be some merit in the way steel scrap is melted in the cupola. In other words, conditions in the various foundries and their methods of cupola operation have a direct bearing upon the resulting product. There are limitations which must be placed on the percentage of steel scrap in the mixture and on the arrangement and melting practice in the cupola. These limitations are principally because of the factors of mass, time and temperature.

It is generally conceded that carbon absorption by iron and steel is directly dependent upon time and temperature. Therefore, these become necessary elements in the melting of steel scrap in cupola charges. From the iron-carbon equilibrium diagram it is obvious that, as carbon increases in iron, the temperature of melting falls. From these phenom-

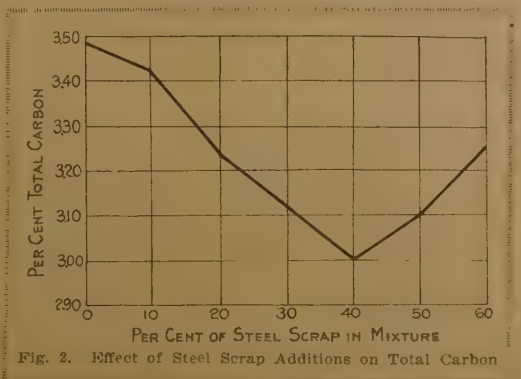


Fig. 2. Effect of Steel Scrap Additions on Total Carbon

*Metallurgist, Hickman, Williams & Co.

ena, if the time factor is correct, the steel will absorb carbon enough to bring its melting temperature well down to the range of that of the pig iron.

By actual experiment in melting 100 per cent steel scrap charges, it was found that the absorption of carbon readily took place up to 3.00 per cent. These experiments covered various grades of carbon steel, and in each case the final carbon content was within a 0.10 per cent range.

Factors to Be Considered

While discussing the elements which enter into the melting of steel scrap in the cupola, it is well to call attention to the factors which are considered important governors:

1. Diameter of cupola, inside of lining.
2. Height of cupola charging platform above bed.
3. Ratio of tuyere area to melting area.
4. Size of charges.
5. Blast pressure.
6. Volume of blast.
7. Bed charge of coke.
8. Coke charges between iron charges.

These are given as a warning to foundrymen who are not aware of their melting conditions, so that they may forestall their being misled in the belief that they can take their original practice, add a little steel scrap and accomplish the results that follow.

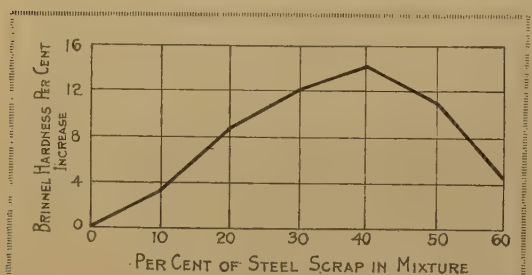


Fig. 3. Effect of Steel Scrap Additions on Hardness of Iron Castings

The diagrams as reproduced show the average results of many tests run from actual production cupolas in one of the largest foundries in the Middle West. The time consumed by each percentage specified extended over a period of four days, so that the sprue was well worked in. The accumulated data as presented are averages of the samples from each of the four daily heats from which six tests were made. Each of the specimens were broken for strength, analyzed and microscopically examined. The bars were standard test bars and were all poured at 2300 deg. Fahr. The chemistry of the iron was held as near to conformity as possible. Fig. 1 shows the effects of varying percentages of steel scrap in cupola mixtures. The two lines indicate the effect on different analyses of irons. The upper one represents the results obtained from a low silicon, and the lower from a high silicon iron. The base grade, or a no-steel scrap mix, has been listed at zero and the percentage increase in strength as co-ordinates. As a matter of fact, the average strengths of the base grades considered were as follows:

Grades, Silicon, Per Cent	Strengths, Lb. per Sq. In.
0.75	22,000
1.20	29,000
1.50	33,800
1.65	33,900
2.10	33,000

By observing the strength chart, Fig. 1, it is seen that there is a limit to the strength obtainable by the additions of steel scrap. The highest, 40 per cent, which gives the maximum strength, is not to be recommended for standard practice, as continual daily remelting causes this mixture of iron to become sluggish after 5 to 10 days. The best working percentages to be suggested is between 20 and 30 per cent steel scrap. This gives a good, strong, close-grained iron, and one which gives satisfactory results.

As an explanation of the added strength given to cast iron by the addition of steel scrap, Figs. 2 and 3 are enlightening. Fig. 2 does not strictly adhere to the tests which were run showing that steel scrap absorbed between 2.90 and 3.00 per cent carbon in the melting. This difference may be attributed to the difference in total carbon of the pig iron and scrap used in the mix. The graphs, however, do confirm the statements that steel scrap dilutes the total carbon present in the iron.

Effect on Hardness

The question of steel scrap tending to harden the casting is amplified by Fig. 3. This increase in hardness is appreciably felt in the wear of the casting and is a noteworthy point for the consumers. This increase in hardness is a result of a slightly increased combined carbon content and the smaller formations of the graphitic carbon present.

The microscope shows a distinctive arrangement of carbon formation for each percentage of steel added. There is a marked tendency to break up the large lamellar formations, causing a more even distribution of the carbon throughout the section. The discussion of microscopic formations, however, is outside the scope of this paper, and the readers are therefore referred to the recent work of many of the leading investigators on the subject of cast iron.

In conclusion, the facts as presented show that semi-steel or high-test irons show a marked improvement over the regular cast irons. It is hoped that a more scientific control of the cupola will cause a wider adoption of this practice.

Iron Ore Problems in Birmingham District

Sampling of iron ores in the Birmingham district has been completed by the Southern experiment station of the United States Bureau of Mines, 453 samples having been taken. These samples are being analyzed at the Birmingham and Minneapolis experiment stations of the bureau. A study of mine supports, particularly with respect to the crushing strength of ores, is now under way. Several cubes have been cut from large blocks of iron ores taken from the mines. When this cube sampling is completed, crushing tests will be made with a view to obtaining data on the strength of iron pillars under compression. A detailed study of the ore beds and associated formations is in progress as a preliminary study to the support problem. Interesting results have been obtained in the investigation looking to improvement in the location of ores, particularly with the dip compass.

Contemplated Steel Plant Expansion at Ashland, Ky.

The American Rolling Mill Co., Middletown, Ohio, which some time ago acquired the properties of the Ashland Iron & Mining Co., at Ashland, Ky., is contemplating extensive additions to its Ashland works, principally in connection with its finishing capacity. Proposed extensions will cost in the neighborhood of $6,000,000. Reports that a $10,000,000 note issue will be offered by the company in the near future appeared on the financial pages of a number of papers last week, but officials of the company had no information to give out when interviewed.

Rolling mill equipment, recently installed at the Wallingford Cold Rolled Steel Co., Wallingford, Conn., plant, has been successfully tested, and is ready for production.

Electric Motor Drive in Steel Industry

Rolling Mill Requirements as to Power, Speed, Adjustability and Changing of Speed—Mill Layouts to Utilize Electric Power

BY GORDON FOX*

PRODUCTION of steel, including metallurgical transformation of the raw materials and mechanical configuration of the product, involves largely the application of heat and power. Although the direct cost of power is only about 5 per cent of the total cost of product, it is more nearly 15 per cent of the cost of mill operations. A ton of steel, in the form of billet, plate or sheet bar, involves a total power expenditure

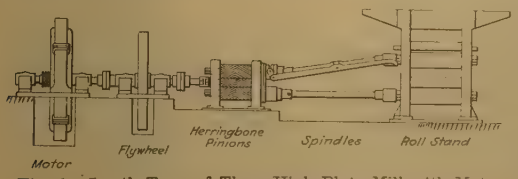


Fig. 1. Lauth Type of Three-High Plate Mill with Motor Drive and Flywheel

of some 200 kw. hr., about half of which is required for blowing at the blast furnace. Due to the large tonnages involved, the cost of power reaches a considerable total expense. In one electrically driven plant producing about 25,000 tons of steel per month, the corresponding electric power cost was about $40,000. Of greater importance than the direct cost of power is the indirect influence of reliability and efficacy of power application.

Electric motive power is applied in the steel mill:

1. Directly, for rolling.
2. For transportation and manipulation of the steel and adjustment of machinery.
3. For driving accessory apparatus.

Relative usage varies. In a mill which is electrically equipped throughout, the power consumed in rolling is, in general, about 60 per cent of the total, the balance being used by auxiliary and accessory drives.

Power media employed in steel mills are steam, water, compressed air and electricity. Prior to the advent of the electric motor, steam and hydraulic drives were extensively employed for main rolls and auxiliaries, respectively. Most new mills are now equipped with electrically driven main rolls, and the less efficient steam drives are being replaced. Hydraulic power is still retained to some extent for auxiliaries. It has points of advantage, particularly for slow and short linear motions. Hydraulic mechanisms are inherently reciprocating as contrasted with high speed rotation obtained with motors. For linear motions, motors must be provided with screws, racks or cranks, and perhaps several gear reductions, introducing complication, cost, space and inertia factors.

Hydraulic drive is well adapted to shears. It is used where the market does not warrant the development of electric equipment, as for revolving ladle cranes. It is also used for counter-balancing, as at main rolls and lifting tables. The principal disadvantages of hydraulic drive are piping expense, inconvenient control, low efficiency, high maintenance costs, freezing and danger from leakage about molten metal. Compressed air is used to a limited extent for minor linear motions and for riveting and chipping.

One of the principal advantages of electric power in the steel mill lies in the fact that it permits centralized generation. The power plant, equipped with efficient condensing turbine generators, occupies a minimum of space and may be located to its best advantage, yet not conflicting with mill layout. Waste heat from blast furnaces may be utilized effectively and completely. The diversity factor between mill demands results in a relatively good load factor on the power house and boiler plant. Duplication of boiler capacity and operating forces is thus minimized. Power can be generated to best advantage on a quantity scale in a central plant.

Electric power can be easily and economically transmitted in quantity. Protection of the distribution means is readily afforded. Duplicate feeders, loop systems or inter-connection may be employed. Faults are quickly isolated. There are no stand-by power losses at point of application; moving machinery may be readily supplied. The ease of metering electric power permits a ready check on rolling conditions. It permits rolling at maximum safe rates and assists to economies.

The possibilities of purchased electric power are attractive in many instances, either as a main or supplementary source or as a stand-by, particularly for plants in which waste heat is not available. The investment may thus be minimized. Probably the principal deterrent to the more general use of purchased power for steel mills is the experience of lack of reliability. The steel mill power plant compares in reliability and continuity with the central station and enjoys the advantage of contiguity. Transmission interruptions are still of too frequent occurrence with

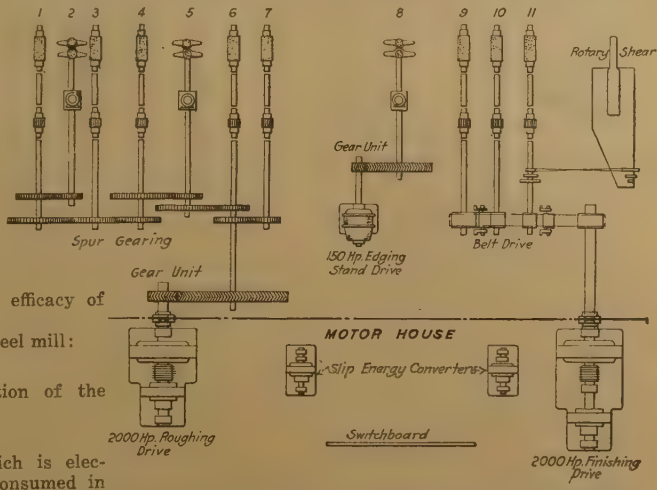


Fig. 2. Layout of 10-In. Continuous Skelp Mill with Roughing Stands Gear Driven from One Motor and Finishing Stands Belt Driven from Another. Two of the edging mills are driven by gear from the roughing stand drive; the third has a separate motor

*Electrical engineer Freyn, Brassert & Co., Chicago. This paper, before the Western Society of Engineers, won the Robert W. Hunt prize for the best discussion of some phase of the steel industry.

some utilities. Power interruptions at a steel mill are always serious and sometimes almost disastrous in their consequences. Interruptions from an outside source are particularly inconvenient because of their indefinite duration.

Probably the greatest advantages of electric drive are derived at the motors. Their compact form, light weight and wide range of characteristics permits their effective application to all classes of main and auxiliary apparatus. Their ease and flexibility of control as to speed, torque, direction of rotation and braking are of preëminent advantage. Their ready subdivision into units as desired assists in simplifying the drives. Their reliability is evidenced by the fact that, in most mills, the electrical delays are few and usually of short

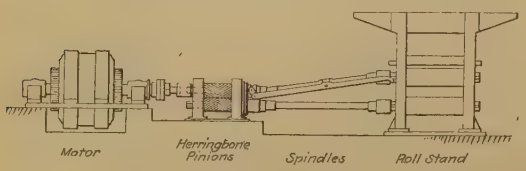


Fig. 3. Reversible Two-High Blooming Mill with Motor Drive

duration. They involve relatively low inspection and maintenance charges. The overall economy from coal pile to the work is comparable or superior to that of other drive media. Motors involve no stand-by losses, and may be started and stopped on short notice. Their uniform torque and speed minimizes mill wear and breakage. Automatic control, with current limiting and protective features, safeguards both the drive and the mill and minimizes dependence upon the operator.

Electric drives for main rolls are available, having a wide range of characteristics. The general type of drive selected depends primarily upon the type of mill and its requirements. There are now installed in the United States and Canada more than 600 main roll motors. These represent a variety of mill arrangements which do not permit of distinct classification. There are, however, some predominating features which render possible a liberal classification of mills from the motor drive viewpoint. Such a classification will be here attempted and the principal features of the various mill types briefly discussed, chiefly as they relate to drive considerations.

Classification of Rolling Mills

Many mills comprise essentially one or more stands or trains of rolls which revolve continuously in one direction. Three-high stands are commonly used, in which the metal is passed forward between the two lower rolls and returned between the two upper rolls. Two or more such stands are often connected in train, that is, with all roll axes in a common vertical plane and with the drive shafts in series, so to speak. The most simple merchant mills are of this type. The last stand in this mill is commonly two-high, as the piece passes through it in one direction only; and better finish can be obtained than in a three-high mill, where the center roll serves double duty.

Some billet mills comprise two or more three-high stands, arranged either in train or in tandem. Rail and structural mills vary in layout, but commonly include three-high trains and tandem sets, which operate continuously in one direction and largely at fixed speeds.

Sheared plate is generally rolled on three-high mills of the Lauth type, the principle of which is shown in Fig. 1. The upper and lower rolls are driven, while the intermediate roll is rotated solely by friction from the roll which backs it up. Both the upper and the intermediate rolls may be raised and lowered. Tilting tables are provided in front and rear of the mills, and two such stands may be used in tandem.

So-called continuous mills comprise a number of two-high stands arranged in tandem, so that the metal passes in a straight line through the stands in sequence. All rolls revolve continuously in one direction. The rolls in each successive stand must revolve faster than those in the preceding stand by an amount just sufficient to account for the elongation, and thus prevent or minimize looping. As the delivery speed of a stand is approximately the same as the peripheral speed of the rolls, the intake speed varies in proportion to the draft. Thus, for a 30 per cent reduction in area, intake speed is to exit speed as 70 is to 100. This ratio varies some with different sections.

Some control is possible by adjusting the reduction in each stand. Guides are commonly inserted between stands to skew the metal, so as to work it from all sides, and also to clear the scale. Mills of this type are often divided into groups of stands, usually for roughing and finishing, each group being separately driven. The stands in each group are connected through gearing or belt to the drive. Fig. 2 illustrates a type of continuous mill.

Continuous mills are widely used both for roughing and for producing the simpler shapes. At Gary there is installed a continuous blooming mill having nine stands. This principle is widely used for billet, skelp, sheet bar, strip, merchant and rod mills. The chief advantages of the continuous mill are large production with little labor and rapid reduction with little cooling between passes. The rolls are of short length, and consequently may be of relatively small diameter. This type of mill requires relatively low power per unit of output, due both to the high temperature of working and to the small roll diameters.

The simple reversing mill comprises a single two-high stand of rolls. The lower roll is fixed in elevation, while the upper roll may be raised and lowered by a screw acting against a hydraulic balancing cylinder. These rolls are driven through spindles from a pair of pinions, which, in turn, are driven by the engine or motor through a flexible coupling. The metal is passed alternately forward and back between these rolls, which are reversed for each pass. Live tables are located in front and rear of the mill.

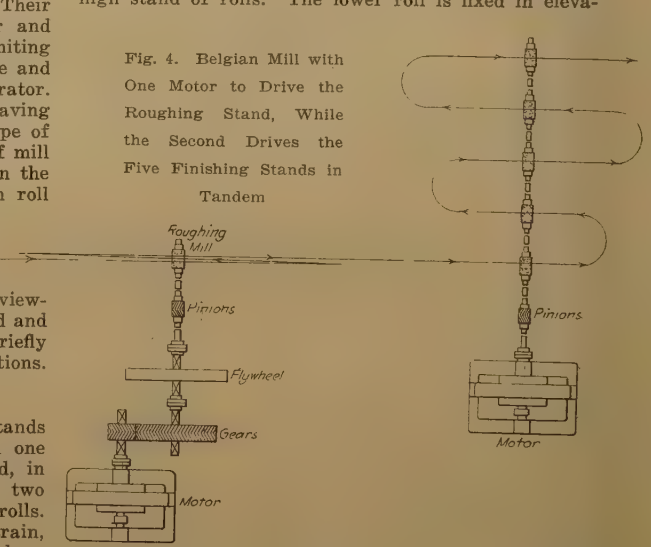


Fig. 4. Belgian Mill with One Motor to Drive the Roughing Stand, While the Second Drives the Five Finishing Stands in Tandem

Electrically driven blooming mills are almost exclusively of the reversing type. In these mills movable aligning guards are located above the tables to guide the piece into the proper pass of the main rolls. A manipulating device serves to edge the piece when desired, so that it may be reduced in two dimensions. The general arrangement of such a mill is shown in Fig. 3. The principal application of the simple reversing mill is for roughing ingots. A reversing billet mill has been installed at the Mark Plant of the Steel & Tube Co. of America.

The universal mill is a reversing mill comprising a two-high stand of horizontal rolls, and, in addition, one or two sets of vertical rolls located at the sides of the mill ahead of and/or behind the horizontal rolls. The vertical rolls, which work on the edges of the piece,

and may be moved in and out, are driven through gearing from the main pinions. Universal mills are employed extensively for rolling slabs and universal plate. They are also used for some structural shapes.

The reversing mill enjoys a number of important advantages for breaking down ingots. It is flexible in that both slabs and blooms of various dimensions may be rolled, as ordered, without changing rolls. Due to the absence of lifting or tilting tables, the interval required between passes for manipulating and returning the piece may be made short. The steel may be entered between the rolls slowly, permitting of heavy draft without shock and avoiding slippage. The speed at each pass can be adapted to the length of the piece. The draft is under the control of the operator and can be varied for different steels or for a cold piece, and extra passes may be employed as desired. Due to the absence of lifting tables, the reversing mill as a whole is mechanically simpler than the three-high mill. Although the electric drive equipment is more complex, experience has shown that delays from electrical sources are less frequent and usually less serious than mechanical delays, so that additional electrical complexity is warranted by mechanical simplicity.

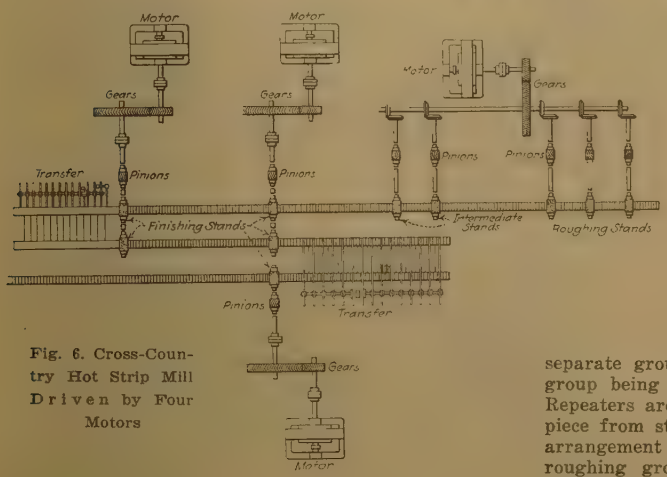


Fig. 6. Cross-Country Hot Strip Mill Driven by Four Motors

At the Brier Hill Steel Co. is installed a reversing mill used for roughing plates, which are finished in a three-high mill of the Lauth type. It has been found that this reversing mill is preferable to a three-high roughing mill, particularly as to the short interval between passes. In rolling sheared plate it is necessary to turn the slab 90 deg. after it has been rolled to width in the first passes. It is easier to turn the slab on the fixed tables of the reversing mill than on the lifting tables of the three-high mill. Moreover, it is not necessary to square the piece accurately on the reversing mill, as it can be run against the main rolls and thus squared before the latter are accelerated and the piece entered. It has been suggested driving the three-high plate mill with a motor without flywheel, similar to a reversing motor, which could be stopped between passes when desired, but such a drive has never been installed.

Many mills combine the various types of stands or groups. One of the simpler combinations is the so-called Belgian mill. The single roughing stand of this mill is three-high; the finishing mill contains three-high and two-high stands in train. The piece, usually a billet, is roughed down by several passes in the roughing stand and then entered into the finishing mill and looped from one pass to the next through the various stands. Fig 4 shows the general arrangement of one type of Belgian mill. The advantage of this mill lies in the fact that the roughing stand is driven at a lower speed than the finishing train. A low speed is suitable for roughing work, as the rolls bite better on the heavy drafts and difficulty in entering the billet is avoided. Moreover, the finishing stands may be driven at a higher speed, as they are less compromised by the roughing stand requirements. As several passes are made in the roughing stand of a Belgian mill, this is a limiting factor in production.

One development of the Belgian mill is the combination mill which comprises a roughing mill having several two-high stands in tandem, on the continuous principle. This is followed by two or three

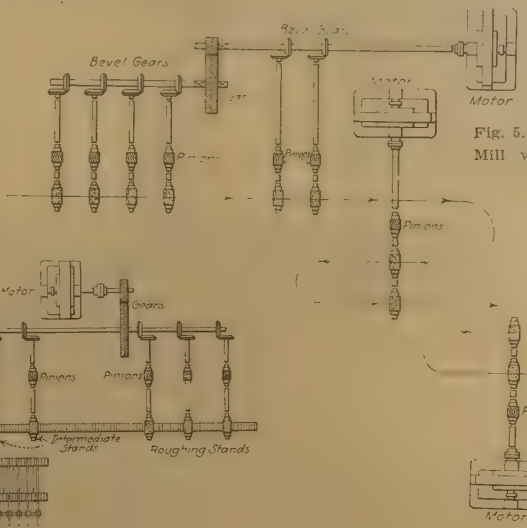


Fig. 5. Combination Mill with Three Drives

separate groups of three-high stands in train, each group being separately driven at a different speed. Repeaters are used, at least in part, for guiding the piece from stand to stand. Fig. 5 shows the general arrangement of a combination mill. The continuous roughing group is able to maintain production to fill the finishing mills. The operation of the looping stands at different speeds reduces the length of loops between stands and thus avoids excessive cooling. It maintains the larger sections longer, both due to lower roughing speeds and by permitting more reduction in the later passes. It permits each group to operate at its most suitable speed and prevents restriction of the speed of the finishing rolls, which should be as high as possible.

The cross country mill, Fig. 6, is a combination made up of several stands or trains in tandem, but separated so that the material leaves one before entering another. The piece is carried between stands by live roll tables or transfers. To avoid excessive length of mill the piece may take a zigzag course, reversing its general direction of travel in passing through the various sets. This arrangement of mill usually permits rolling the steel in both directions, which improves its quality. The individual groups or sets may be driven separately or by gear, belt or rope, from a common source. The cross country mill is used to roll products not well adapted, due to size or shape, for continuous or loop mill rolling.

A sheet mill consists of two stands of two-high rolls, one pair being used for roughing, the other for finishing. The rolls revolve continuously in one direction at slow speed. The sheet bars are passed between the rolls by the roller and returned over the top roll by the catcher. The lower roll is at a fixed elevation and is driven. The upper roll revolves solely by friction from the lower roll or the steel and is fed up and down by screws. Several pairs of stands are commonly connected in train and driven by a single motor.

(To be concluded)

Improvements in Heroult Electric Furnace

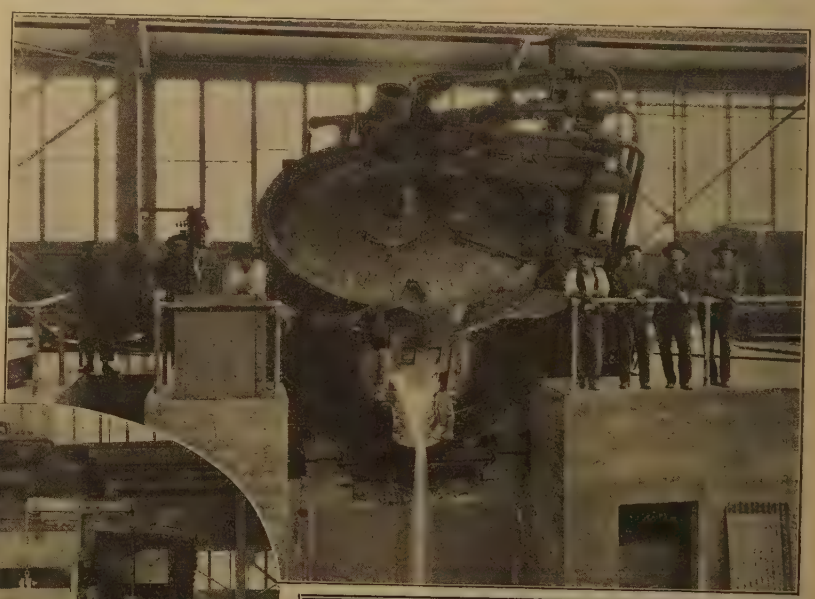
Copper Pipes Carrying Cooling Water Used Instead of Copper Busses—Transformer Room Underneath the Charging Floor

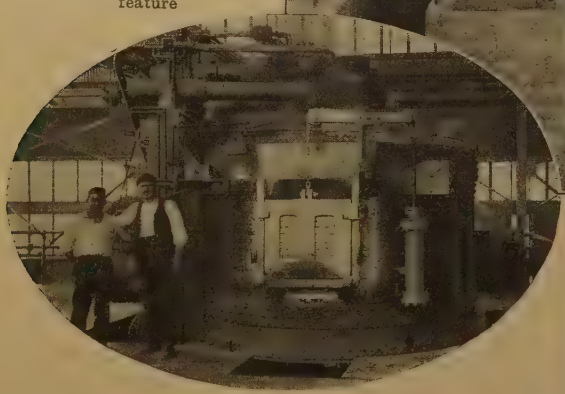
THERE has been recently installed and placed in operation a 7-ton Heroult electric furnace at the plant of the International Nickel Co. at Huntington, W. Va. Although this furnace embodies the usual features of this type of furnace as manufactured by the American Bridge Co., the design is a new one and there are certain modifications or improvements which are shown in the accompanying illustrations.

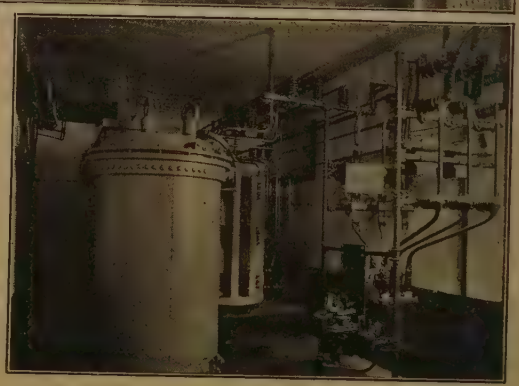
The furnace is used for melting and refining Monel metal, which is cast into ingots for subsequent forging and rolling. It has a basic lining and desulphurization and deoxidation are carried on under a basic slag, as is customary with steel. Practically all heats tapped up to the present time have been as low as 0.005 per cent sulphur.

The Larger Picture Shows the New Type of Heroult Electric Furnace with the Copper Pipes as Conductors Leading Up from the Transformer Room, Situated Under the Platform. The entrance to it is through the door, just below the four men. The illustration just under the door is the transformer room itself

The oval shows the furnace while in operation on Monel metal. The absence of the usual large amount of smoke and gases is considered a feature







Copper Pipes as Conductors

Instead of using built-up copper busses the electric current is conducted to the electrodes by means of copper pipes. The pipes also serve to carry water to the electrode holders and to the electrode coolers. For electrical reasons, a hollow circular section is the best one for conducting alternating current, and as the copper is water-cooled, only about one-third as much copper is required as when using busses. This is particularly true when the busses have to be carried over a hot furnace. All designers of electric furnaces have had to contend with the difficulties arising from reactance in furnaces of a large enough size so that the electric current required was considerable; for instance, where the amperes exceeded 7000. The trouble due to reactance is accentuated by having long conductors spread far apart and where the electric conductors pass near or between iron parts.

In most of the familiar types of electric furnaces there is a mast made of structural material, used to support the electrode cranes. It was found necessary to carry the conductors over the top of these masts in order to avoid proximity to iron parts with the consequent reactance. This also involved having overhead flexible cables. In the present design the mast is eliminated and the electrode cranes supported from below.

Transformer Room Under the Platform

The relatively small copper pipe conductors can be brought very close to each other, which makes it possible to have longer leads and at the same time have them extend beneath the floor. The necessary headroom for the passage of cranes is reduced and no flexible cables or other obstruction surround the furnace, the transformer room being beneath the floor. This arrangement makes it more convenient to have the electrode supporting mechanism attached to the furnace, either at the back opposite to the pouring spout or on the left or right hand side. In the present case this mechanism is placed on the left hand side.

The transformers are 1800 k.v.a. water-cooled, General Electric transformers. The cooling water passes through the transformer and then through the copper pipe conductors, thence to the electrode holders, through a flexible connection and back to the electrode coolers.

The normal operating voltage is 100, although taps are provided to give higher voltages in case the voltage on the high tension line should be below normal. In order to avoid surges on the line and obtain steady operation, it was thought advisable not to have the power factor higher than 0.90 and additional external reactance was provided and is of the type furnished by the General Electric Company, as shown in one of the illustrations.

The cylindrical form of shell was adopted in preference to the dished or bowl shaped bottom, on account of its structural strength. These furnaces were formerly tipped about a hinge on line with the pouring spout and the furnace was provided with counterweights. In the rocker type of furnace the usual type of rocker rolling on a plain surface requires the cylindrical shell to stand too high above the foundation. In the present design, both the casting on which the furnace rolls and the rocker are curved. By thus dividing the curvature between the two castings the advantage of the rocker type is obtained without having the center of gravity above the rolling center. The furnace tilts backward as well as forward.

The arms carrying the electrodes have been brought in at an angle, for the purpose of placing the electrodes as close as possible to each other and to the center of the furnace. This is important in furnaces of high power, to avoid burning the furnace lining, especially where the basic process is used. The electrodes are actuated by winches and motors attached to the furnace. The General Electric Co. regulator is used. The tilting mechanism consists of two gear wheels on the same shaft, with connecting rods attached to the furnace. The tilting motor is of 15 horsepower.

Although the rated capacity of this furnace is 7 net tons, on account of the weight and compactness of Monel metal, heats of 9 tons are being tapped.

Rocky Mountain Industrial Relations Conference

The second annual conference on human relations in industry, under the management of the industrial department of the Young Men's Christian Association, was held at Association Camp, Estes Park, Col., July 28, 29 and 30. The sessions were attended by several hundred persons, mostly business men and manufacturers from Colorado, Utah, Wyoming, Nebraska, Kansas, Oklahoma, Texas and Montana, with a scattering of visitors from Eastern states. Program and general arrangements were in the hands of A. Bruce Minear, international industrial Y. M. C. A. secretary in the Rocky Mountain region.

The purpose of the conference was to discuss subjects connected with relations of employer, employee and consumer. Addresses, most of them given by men prominent in industrial management, covered various phases of these relations. Besides the prepared talks, there were general discussions in which different points of view were advanced and experiences exchanged.

The industrial relations conference grew out of a small week-end meeting of business men held in connection with the Y. M. C. A. schools at Estes Park in the summer of 1921. At this meeting it was suggested that a more widely attended conference be held in 1922, and that a foreman's course be conducted at one of the Y. M. C. A. schools. Both suggestions were carried out through co-operation between the Y. M. C. A. industrial department and interested business men of the Rocky Mountain district.

The program of the conference follows:

"Progress in Recent Years in Human Relations in Industry," E. H. Weitzel, Pueblo, Col., general manager Colorado Fuel & Iron Co.

"The Three-fold Responsibility of Management to the Parties in Industry," W. C. Coleman, Wichita, Kan., president Coleman Lamp Co.

"Japan's Industrial Future," J. Merle Davis, Tokio, Japan, industrial secretary Y. M. C. A.

"The Training of Men from the Industrial Standpoint," L. A. Gilbert, Denver, manager Swift & Co.

"Confidence and Goodwill," W. L. Petrikin, Denver, president Great Western Sugar Co.

"The Public and Industrial Relations," B. B. Brooks, Casper, Wyo., former governor of Wyoming.

"A Program of Health and Recreation in Industry," Dr. Henry F. Kallenberg, Chicago.

Sermon, the Rev. David G. Latshaw, New York.

"The Christian Spirit in Industry," T. W. Currie, professor, University of Texas.

The school for foremen and other business executives, conducted in connection with the industrial relations conference, covered a course of five days, July 24-28, inclusive, with intensive instruction in the following general subjects:

Industrial Leadership, by Fred O. Kelley, Lincoln, Neb., industrial secretary of the Y. M. C. A.

Industrial History and Economics, by E. S. Cowdrick, Denver, industrial engineer.

Industrial Organization, by T. E. Barker, Denver, general superintendent, Denver Rock Drill Mfg. Co.

The Sermon on the Mount as applied to industry, by T. W. Currie, University of Texas.

In addition to the four classes, there was a daily open forum, led by one of the students, in which subjects of direct interest to industrial executives were thrown open to general discussion. More than forty foremen, superintendents and others were enrolled.

It is planned to make the school for executives and the conference on human relations in industry an annual event, and preliminary arrangements for the 1923 meetings already are under way.

Trend of Wages Over the Depression

Figures of the National Industrial Conference Board for wages covering the period from July, 1914, to January, 1922, show average hourly and weekly earnings, average hours of employment and the ratio obtained by comparing money wages with cost of living. The figures are based on 26 major industries, 3800 industrial establishments and more than 1,000,000 wage earners.

As shown in our table, the average hourly earnings of all wage earners were 98 per cent higher at the end of December, 1921, than in July, 1914. The drop between December, 1920, and December, 1921, was 22.4 per cent. Common labor was 92 per cent higher in December, 1921, than in 1914, but 27.1 per cent lower than in September, 1920. Skilled labor was 98 per cent higher than in 1914, but 20.7 per cent lower than in September, 1920.

Because of shorter working weeks, the average weekly earnings of all wage earners was only 80 per cent higher than in July, 1914, but was 25 per cent lower than in July, 1920. Similarly, common labor was 74 per cent higher than in 1914 and 30.2 per cent lower than in August, 1920. Skilled labor was 80 per cent above the 1914 level and 23.8 per cent below July and August, 1920.

Real wages, meaning the purchasing power of the money wages received, were 11 per cent higher at the beginning of this year than in 1914. In other words, the standard of living had increased to that extent, this resulting from the fact that wages were 80.2 per cent higher and living cost 62.3 per cent higher than in 1914, the excess of wages accounting for the increased real wage or purchasing power. The highest point of real wages during the entire period under survey was reached in October, 1920, with 21 per cent greater real wages than in 1914.

	July, 1914	Peak, 1920	Dec., 1921
Hourly earnings:			
All wage earners..	24.3c.	a 62.1c.	48.2c.
Common labor.....	20.7	b 54.6	39.8
Skilled labor, male	28.0	b 70.0	55.5
Women	15.6	c 41.7	34.7
Weekly earnings:			
All wage earners..	$12.36	d $29.69	$22.27
Common labor.....	10.89	e 27.14	18.95
Skilled labor, male	14.19	d 33.64	25.66
Women	7.82	c 18.79	15.76
Hours per week:			
Average nominal..	55.1	c 50.7	49.8
Plant activity	53.8	c 49.8	47.2
Per wage earner..	51.0	c 48.5	46.2
Index number:			
Wages, weekly....	100	d 240.0	180.2
Cost of living.....	100	d 204.5	162.3
Real wages.....	100	f 121.0	111.0

a—December. b—September. c—June. d—July. e—August. f—October; July showed 117.

Core Box for Making Sash-Weight Cores

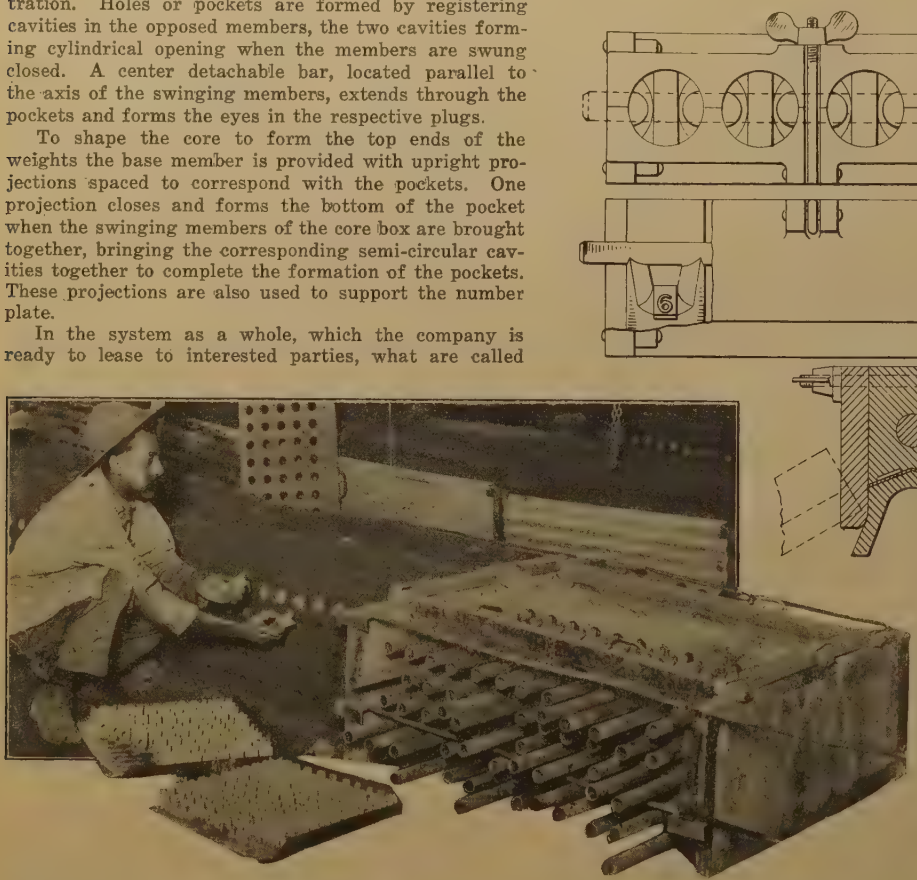
A patented combination core box for use in connection with end-drawn sash weight flasks, and which together form a special system of making sash weights, is being offered by the De Ved Brothers, Inc., Baltimore. This system is intended to permit the production of sash weights in large tonnage at very low cost, with a smooth eye and plainly marked.

The core produced by the box is in the form of a plug adapted to close the top of the sand mold in which the weight is cast, forming the eye which receives the sash cord, and incidentally forming the entire top of the weight.

The core box is made up of two side members pivoted to open and close in a tongwise manner. These members are pivoted to a base as shown in the illustration. Holes or pockets are formed by registering cavities in the opposed members, the two cavities forming cylindrical opening when the members are swung closed. A center detachable bar, located parallel to the axis of the swinging members, extends through the pockets and forms the eyes in the respective plugs.

To shape the core to form the top ends of the weights the base member is provided with upright projections spaced to correspond with the pockets. One projection closes and forms the bottom of the pocket when the swinging members of the core box are brought together, bringing the corresponding semi-circular cavities together to complete the formation of the pockets. These projections are also used to support the number plate.

In the system as a whole, which the company is ready to lease to interested parties, what are called



Core Box for Making Sash-Weight Cores. Top plan, side and end elevations are shown above. The end-drawn flasks and placing of cores are shown at left

end-drawn flasks are used. These are 4 ft. long, 4 ft. wide and 18 in. high and contain 120 sash weights to the flask, or from 800 to 1000 lb. of iron. It is claimed that one laborer can put up 10 to 12 of these flasks per day, making 8000 to 12,000 lb. of sash weights and that experienced molders are not necessary to perform this molding, common labor being said to be adequate for the process.

With the combination core box described it is claimed that the cores for the flasks can be made by a boy at the rate of 500 per hr. It is figured that the cost of molding and of making the cores is one dollar per ton, the flasks now up, ready for the hot iron. A very cheap grade of melting scrap and also very low grade of scrap such as roofing tin, sheet metal clippings, etc., can be used in this system.

The company recommends the system to all foundries to be worked in with other general foundry work, it being emphasized that this system permits a foundry to produce sash weights for local requirements at a saving in freight and handling expense and permits of quick delivery to nearby consumers.

Electric Alloy-Atlas Crucible Merger

President L. J. Campbell of the Electric Alloy Steel Co., Youngstown, Ohio, announces that the merger of this property with the Atlas Crucible Steel Co., Dunkirk, N. Y., is virtually completed. Consummation of the consolidation may be expected very shortly, he states. Mr. Campbell will be chairman of the board and chief executive officer, located at Dunkirk. To unify management, leading directors of the Electric Alloy company have been added to the board of the Atlas Crucible Steel Co., including James A. Campbell, Thomas J. Bray, W. A. Thomas and L. J. Campbell.

As far as possible the properties will be operated as a single unit until the merger details are actually completed, in order to get the advantages of operating economies which will thereby be effected. A temporary working arrangement, with Mr. Campbell in charge, is therefore in effect until legal consummation of the merger is completed.

Permits were issued in Chicago in July for 1144 buildings, fronting 33,075 ft. and involving a total cost of $16,214,300 as against 754 permits for structures fronting 21,403 ft. and costing $14,004,650 in July, 1921, an increase of 390 permits, 11,671 ft. of frontage and $2,209,650 in cost. The figures, however, show a decrease as compared with June, 1922, of 275 permits, 8744 ft. of frontage and $10,362,550. Figures for the first seven months of 1922, showing 7569 permits, 233,960 ft. of frontage and a cost of $127,716,610, are greatly in excess of the records for the same months in previous years as far back as and including 1913.

The United Coke & Coal Co., seller of foundry, furnace and domestic coke and coal, has moved its offices from 2013 to 814 Fisher Building, Chicago.

Notes on Acid Electric Furnace Practice*

Basic Scrap and How to Charge It—Making a New Bottom —When to Tap and How to Pour—Alloy Additions in the Furnace

BY CHARLES WELLMAN FRANCIS

ACID practice is the most universally used in the present day foundry for the manufacture of steel castings. This fact was probably due largely to the recent world war conditions which brought about a great scarcity of Austrian magnesite in this country, magnesite being the best of all basic refractories, and has caused the development of our own American product to such an extent that we have pretty closely approached the qualities of the Old World material which we at one time thought could not be equaled. Again, production was the first word in the American steel industry during this period, and acid practice is the fastest and most economical when ordinary physical and chemical specifications only are to be met. As a result, one great difficulty has arisen which may tend to swing us back more generally to basic operation, namely, that our scrap as a product of the acid-lined furnace has gradually become more impure in quality, due to no refining. Also during this reconstruction period, competition has become much keener, which will tend to the manufacture of finer grades of steel.

Basic Scrap for Acid Furnaces

As has been mentioned in one of the previous articles, the writer has found it advisable to use a good basic scrap for charging the acid furnace. This scrap should be of a light, quick melting, shoveling type, and yet have body enough to prevent the electrodes from quickly penetrating it and striking the furnace bottom. To help prevent the latter occurring, the foundry scrap portion of the charge, which usually makes up 40 to 50 per cent of the melt, is first placed on the bottom of the furnace with the purchased scrap on top, taking care to prevent the piling of the scrap against the side walls and banks as much as possible.

There is a double reason for piling the scrap in the center of the furnace as much as possible and consequently keeping it off the banks and side walls unnecessarily. First, when it is piled in a heap in the center of the furnace it will be the melting zone of the electrodes, which tends to enhance quick melting. Second, a great amount of unnecessary labor is done away with because this scrap clings to the side walls and banks and must be pulled into the bath when the furnace is hot. Of course, some of this work always has to be done, no matter how carefully the furnace is charged, but it is advisable to eliminate hot and heavy work wherever possible. It is important to emphasize here that the rate of melting is solely dependent on the manner in which the furnace is charged and how the current is applied.

When the charge is entirely melted a test is taken and broken for a fracture reading by the melter; one portion of the test piece is then drilled and sent to the laboratory for analysis. According to the result of the analysis, the necessary amount of ferroalloys is added as soon as the metal is hot enough to pour. No slag mixture is added during the acid electric furnace heat, as the impurities in the scrap, together with the washings from the banks and side walls, form sufficient slag. Often an acid heat will melt practically free of slag, but from the time the charge is entirely melted until the heat is ready to be tapped, the slag will accumulate rapidly. An acid heat should be tapped when the slag bubbles and becomes puffy, which is often termed a "dry" slag.

When the heat is tapped the furnace is ready for fettling or repairing. This work depends entirely on the condition of the furnace bottom and banks, and requires considerable experience to be done properly. Ground ganister is used and sometimes it is mixed with silica sand, depending on the conditions of the furnace. This material is usually wet thoroughly, because the wet mixture can be more accurately thrown from a shovel to the desired point in the furnace. Also because the wet mass will not spread as will dry fettling material when thrown from the shovel. Inexperience in doing this work is usually illustrated by the building up of the furnace bottom or the rapid disappearance of the banks, caused by using too much bottom mixture or not enough, respectively. Great care must be taken in repairing a "hole" which is sometimes left in the banks or bottom after a heat is tapped. In doing this the same methods are employed as are used in open-hearth furnace practice. If the hole is small the hot metal which stays pocketed therein can generally be balled on the end of a cold rabble or hook and pulled out. If the hole is larger the use of a little silica sand will help the operation considerably.

After making bottom, as the above operation is commonly termed by steel melters, it is advisable to close the furnace doors and let stand for a few minutes, as the intense heat of the furnace will cause the new repairs to set into place, and consequently it will not be so easily displaced by charging the foundry scrap.

Burning in a New Bottom

Burning in a new furnace bottom is one of the most important features in any type of furnace practice. Methods used in the electric furnace differ considerably from those used in open-hearth furnace work. Ground ganister, silica "grits," silica sand and fire clay are used in the proper proportion to form a somewhat plastic mixture, and the entire bottom is put in place in one operation with the use of a foundry air rammer, and smoothed off to the desired contour. The bottom should then be dried thoroughly with a wood fire from 24 to 48 hr., after which the furnace is dumped to remove the ashes and a bed of coke is distributed evenly over the bottom. The electrodes are lowered and the power turned on as low as possible. Four to six hours of burning, with the power on and off intermittently, is often sufficient to give the bottom the necessary baking, prior to charging the furnace. The furnace will gradually become hotter under these conditions, and it will be found advisable to leave the power on for shorter periods.

After the furnace has been well heated it will be found that these periods during which the power is shut off will give as good results as those during which the power is on, provided the furnace doors are kept closed and sealed, for the new furnace will be getting

*In the issue of July 27, p. 201, the author discussed the choice of an electric furnace and in the issue of Aug. 3, p. 277, the economy features of electric foundry design and equipment.

the desired soaking. It is surprising how quickly the empty furnace will be heated; consequently great care must be exercised not to carry this work on too quickly or a "dripping" of the roof and side walls will take place, greatly diminishing the life of the refractories.

Tapping and Pouring

The remaining phase of this problem which the author wishes to discuss briefly is the tapping and pouring of an acid heat. Considerable controversy arises at times whether to use bottom-pour or lip-pour ladles. For acid heats of three tons capacity or smaller, the lip-pour ladle will be far more economical in the long run because, aside from being much easier to handle, they will last for six to eight heats without being relined other than knocking off large particles of slag and repairing the lip. On the other hand, the bottom-pour ladle for small heats produces considerable distress in a small shop, due to the delays experienced in "setting stopper," to say nothing of the probability of losing a large part of the molten metal in the furnace pit. Just as much care must be exercised in setting the stopper in a small ladle as must be employed in an 80-ton open-hearth ladle.

All the metal should be tapped into a big ladle at once so that the furnace can be given the proper care immediately, instead of being "shanked" from the furnace, as is often done with the smaller size furnaces. Considerable electric power is also saved by getting the furnace charged again as quickly as possible, and analogous to this same principle is the fact that if work is slack in the foundry it is more economical to start the furnace later in the day and take the necessary heats one right after another until the floor is cleared, provided no overtime is necessary.

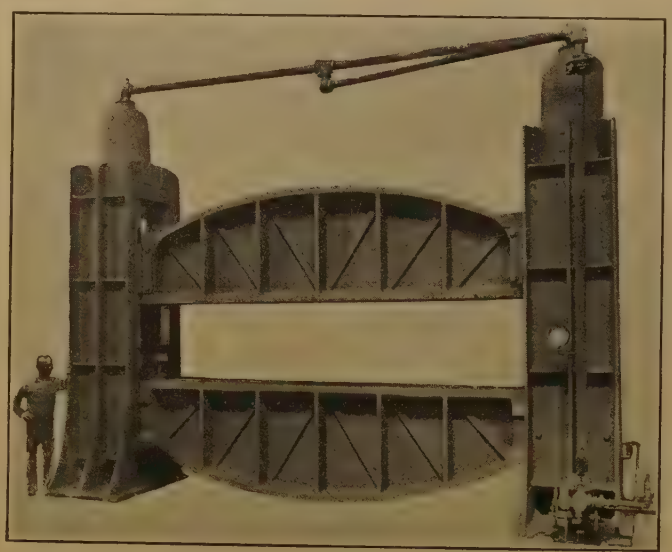
Alloy Additions

There is no general method which is universally followed by electric steel makers in making the alloy additions. Some foundries make their final additions in the ladle, some in the furnace, while other split them half and half, still others adding manganese in the furnace and silicon in the ladle and vice-versa.

There is an old saying among certain open-hearth melters that "the proper place to make the steel is in the furnace." The author is of the opinion that this statement is not far wrong. It has been his personal experience that the best method is as follows: When the heat is ready to be tapped, call for the ladle, and while the ladle is being brought up to position make the necessary additions of ferromanganese and ferrosilicon in the furnace, give the bath a good stirring and tap the heat at once. This method will give the best mixture and uniformity of analysis, and the melter can be reasonably sure that he will get all that he adds, while on the other hand alloy additions in the ladle often cause hard spots, poor mixture and low analysis, especially when the slag is a little "stiff."

Large Hydraulic Flanging Press

A hydraulic flanging press, the total weight of which is 42 tons, and capable of exerting a maximum pressure of 435 tons, is shown in the accompanying illustration. It was built recently by the Hydraulic Press Mfg. Co., Mount Gilead, Ohio, for the Merchants Dispatch Transportation Co., Rochester, N. Y., and is used for flanging the plates for Murphy car ends.



Flanging Press Used for Plates for Murphy Car Ends. It weighs 42 tons and exerts a pressure of 435 tons

The machine will flange cold steel 5/16 in. thick and 10 ft. long. It has a stroke of 24 in., and the maximum distance between platens, daylight space, is 36 in. The two rams are 20 in. in size and located as shown. Two 5½ in. auxiliary cylinders are used for returning the platen. A three-way poppet-type H-P-M high-pressure hydraulic valve controls the movements of the press, the valve being manipulated by one hand lever. The cylinders, platens, housings and other parts of the machine are of cast steel and in connecting up the press H-P-M hydraulic valves and fittings were used.

This equipment is said to be the largest that has ever gone through the Hydraulic Press company's shop, although many presses of higher tonnage have been built. The height and massiveness of the machine may be judged from the size of the workman standing beside it.

Employment in July

WASHINGTON, Aug. 8.—Of the 65 leading cities of the country, 44 report employment increases, according to the industrial analysis of the Department of Labor for July.

"Throughout the country," says the report, "a strong undercurrent in the direction of an industrial recovery is evident, notwithstanding difficulties incident to lack of fuel and transportation. Evidence of this is found in decided increases in 10 of 14 basic industries. The iron and steel industry in some sections suffered keenly through inadequate fuel supply, yet employment registered a material increase. A more substantial increase was shown in the metals and metal products other than iron and steel."

The report further points out that the increase in building operations approaches a boom in many sections of the country. "A thorough canvass of the industrial situation," says the report, "reveals an optimistic opinion that the country, with the settlement of the two major controversies, will experience a rapid advance in industrial prosperity."

The Cedar Rapids Foundry & Machine Co., Cedar Rapids, Iowa, has filed an admission of insolvency in answer to an involuntary bankruptcy petition by several of its creditors.

Let Steel User and Steel Maker Co-operate*

Experiences with Steel in Cement Plant Machinery Show How Failures Might Have Been Avoided— Importance of Heat Treatment

BY W. R. SHIMER

IT was my original intention to present a paper containing definite recommendations for the more important iron and steel parts used in machinery for the manufacture of cement. Upon going into this phase of the subject in detail I find that, due to various local conditions, a steel which is satisfactory for a certain part at cement plant A may not be suitable for the same part at cement plant B. This is due to various reasons, such as difference in hardness of rock, type of machinery, condition of machinery, personnel of operators of machinery, etc. I will, therefore, confine myself to general remarks and attempt to show how to obtain steel which will best suit the purpose and how to draw up specifications which will assure a satisfactory product.

From an examination of certain failed parts there is every indication that some of the failures can be attributed to error in design. For example, the writer had the opportunity to investigate the breakage of shafts in an electrically operated shovel operated in the same quarry with two steam shovels. No shafts were known to break in either of the steam shovels, while the shaft breakages in the electric shovel were frequent.

When the electric shovel was attempting to dig out the side of a hill in one scoop—and since an electric motor will withstand a 100 per cent overload momentarily—the shafts were stressed to double the amount for which they were designed, and as this stress was a sudden one, the shafts naturally twisted off. I understand that when a steam shovel is overstressed it will stall; there are no sudden shocks, and consequently shaft failures are much less frequent in shovels of this type.

The shafts in the electric shovel could not be made larger without making radical changes throughout the entire mechanism, and it was necessary, therefore, to use a special nickel chrome steel, heat treated to give more than twice the elastic limit of the original shafts, and at the same time the elongation and the contraction of area had to be fairly high to insure sufficient ductility to withstand the usual shock and vibration. The physical properties of the failed shafts showed approximately the following:

Tensile strength	62,000
Elastic limit	32,000
Elongation, per cent	35.5
Contraction of area, per cent	61.07

The heat treated alloy steel shafts showed:

Tensile strength	112,000
Elastic limit	90,000
Elongation, per cent	22.5
Contraction of area, per cent	64.0

These physical properties more than make up for the deficiency in the size of the shaft.

The Use of Cold Drawn Steel

For quick repairs, cold drawn shafting was used for shafts in this shovel, and some broke in one week's time. Cold drawn steel is made by pickling all the scale from the hot rolled bar, which is then pulled through a die 1/32 to 1/16 in. less in diameter than the original bar. This produces a bar of accurate size, with a smooth, bright finish. The bar is reduced cold and while cold extends in length in proportion to the amount of reduction in cross section. Low carbon steel is cold drawn without annealing, but the higher carbon and alloy steels are annealed first. The physical effect of this cold working is to raise the elastic limit in the smaller diameters up to approximately 90 per cent of the ultimate tensile strength, with a corresponding decrease in ductility. Prior to cold drawing, the elastic limit of the same steel approximates 50 per cent of the tensile strength, with considerable ductility.

I would not recommend that cold drawn steel be used for important structural parts which must withstand shock and vibration. It is an excellent steel for screw stock, bushings, sockets and parts of this nature which must be turned out cheaply by the thousands on automatics. It is satisfactory for line shafts and other parts of like nature which are not highly stressed. Some years ago an automobile company in an attempt to save money on lathe work, used for a time a cold drawn alloy steel for axles. They were drawn to finished size, and all the machining required was to cut to length and mill the ends square. This proved an expensive economy, as these axles failed in many of the cars after short service and replacements were made free of charge in order to satisfy the car owners. The replacing axles were made of a special heat-treated alloy steel, and they returned to the practice of turning the bars on a lathe rather than to obtain the accurate size by cold drawing.

Cold drawn steel has its field, and I do not wish to be misunderstood in my remarks concerning it. It is, however, false economy to use it for highly stressed parts, as there are so many steels which can be heat-treated to stand up under severe service and which will far outlive cold drawn steel.

Improper Heat Treatment

Many parts fail in cement machinery on account of not being heat-treated, or having been improperly heat treated for the service to be performed. Many times steel of correct composition for a certain use fails in a very short time because of improper heat treatment. When properly heat-treated this same steel will give satisfactory service. We received an order some years ago for ten bars of nickel steel 4 in. in diameter. This order was from a drop forge concern and from the composition of the steel ordered it was inferred that the steel was to be cut up and forged into gear blanks, which subsequently were to be heat-treated. This steel was shipped to the customer in its annealed condition, having been annealed for machinability. A short time later we received a complaint, stating they had made piston rods from three of these bars and put them in drop forge hammers. One lasted 2½ hours and broke; another lasted 5½ hours, and the third lasted about 15 hours. They stated that this so-called high grade nickel steel was inferior to brass or wrought iron. The remaining seven bars were returned and given a special heat treatment by quenching in oil, with subsequent annealing. They were returned to the customer and were found to be entirely satisfactory. In order to obtain the best service from alloy steels, they must be heat treated, as it is not good economy to use them otherwise. When heat treated they are far superior to ordinary steels.

Experiences with Steel Castings

Proper attention is not always given to steel castings, due in part, perhaps, to the users feeling that because the casting was made of steel instead of iron it had all the strength that was required, with the result that no check was made as to the analysis of the steel or to its annealing. This applies, of course, to commercial castings. There have come to my attention quite a few failures of machines where steel castings

*From a paper before the Atlantic City meeting of the Portland Cement Association, June 27, 1922. Mr. Shimer is sales metallurgist of the Bethlehem Steel Co., Bethlehem, Pa.

have been used, the machines in mind being large jaw crushers.

Up to a few years ago, the primary crusher was fitted with a jaw opening of about 24 by 36 in. but with the advent of steam shovels it became necessary to increase the size of crushers, and these machines are now built with openings up to 5½ by 7 ft.

In the designing of these larger size crushers, the manufacturers went to the use of steel and made a great many of the crushers in sectional design, i.e., the side frames and end frames being separate castings, machined and held together by turned bolts.

Another design of crusher consists of a "semi-steel" frame, reinforced with a cast steel band which is shrunk around the bottom of the frame and a cast steel band around the top. The design is such that the steel bands take all of the crushing strain.

The failures of these steel crushers have been due partly to incorrect analysis of the steel and partly to the fact that the castings had not been properly annealed, if annealed at all. In one of the large plants there was broken in operation a crusher in which the frame was 20 ft. long and the cross section of the steel about 6 in. by 5½ ft.

The breakage of these castings showed that the steel was very coarse grained and that it had not been properly annealed, with the result that original strains were still in the castings. Had these castings been properly annealed, there is no question that the machine would have stood up and that the breakage would not have occurred. The repairs to this particular machine will cost the operating company many thousands of dollars, as the machine will first have to be banded together to permit it to continue to operate, and later the side frames entirely replaced with new castings.

There has also been brought to my attention the failure of a crusher which was reinforced with a heavy steel band. This band was of oval shape and had a wall cross section of 5 by 24 in. It broke at three points almost simultaneously, and the nature of the breaks indicated brittleness. Investigation showed that the casting was too high in carbon and that it had not been properly annealed. The microscope showed a structure of steel in the same condition as when cast; if it had been annealed at all, it only went through the motions of this operation, as there was no indication of annealing from the examination of the casting itself.

Customary Specifications and Tests

The practice generally followed is to specify certain physical properties in accordance with the specifications of the American Society for Testing Materials. The tests are taken from coupons attached to the casting, and heat-treated with the casting. Test coupons are integral with the casting. They should not be broken from the casting until it has been heat treated. If, by accident, the coupons should be broken off prior to annealing, they should not be heat treated separately but should be charged in the same annealing furnace at the same time with the casting in order that it receive identical heat treatment with same. This is necessary in order to be assured that the physical results obtained from the coupon represent the physical properties of the casting itself.

Failures such as those just briefly cited might mislead prospective purchasers into believing the machinery itself was at fault. In cases of this kind, no reflection can be cast upon the make or design, because the failures are directly due to the fact that the makers of the castings did not furnish a good product. It is always unwise to place an order for a special part to the lowest or any bidder, without first having been satisfied as to his ability to furnish a satisfactory product.

I believe I am safe in stating that the average mechanical engineer knows steel only in a general way, as he has neither the time nor the opportunity to keep up to date with the rapid advances made in this art. Even we who are working on this subject all the time find it difficult to keep pace. An engineer will design a part and figure on a certain factor of safety, for example of 5 to 1, when he expects to encounter shocks, etc. With this factor of safety, he may require steel of, say, 110,000 lb. elastic limit, which predetermines an ultimate strength of approximately 140,000 lb., but loses sight of the fact that to meet this high elastic limit, the elongation and contraction will be relatively low, and he will have a steel lacking in ductility, so that the real factor of safety is actually much lower. For such a highly stressed part, he would have a more satisfactory product if he used a factor of safety of 4 to 1, and asked for a steel having, say, 90,000 lb. elastic limit, with proportionately lower tensile strength, since he would have a corresponding increase in ductility, thereby enabling the part to withstand shock and vibration.

Importance of Ductility

One big problem in some cement plants is to obtain satisfactory shafts for gyratory crushers. Low to high carbon steels and alloy steels heat treated for high tensile strength and elastic limit have been used, but certain plants still have more breakages than they should. I have been investigating this subject with a view to developing a satisfactory steel and a heat treatment for this purpose. In general, I find the tensile properties need not be high, but the important properties are elongation and contraction of area. The shafts which on the average stand up longest in service are those with greatest ductility.

I have interviewed a number of cement plant operators who use the gyratory crushers and find such shaft failures are peculiar to certain plants, while others rarely if ever have this trouble. The plants which have no failures attribute their success to the fact that they make a special effort to keep dipper teeth, sledge hammers, and other iron and steel parts from going through the crusher. The penalty to employees allowing such parts to go through is dismissal. I am inclined to believe that this is one of the major reasons for shaft breakages, as this would explain why the harder shafts are more susceptible to failure than the softer and more ductile ones.

When a large piece of steel passes through a crusher, something has to give, as the crusher itself cannot stall. If the liner plates do not break, the shaft must distort. A hard shaft will act as a spring, but the excessive strain which has been put on some points, usually on the outside surface, will produce a nick of perhaps microscopic size, which we might call an incipient break, and during continued service it grows larger, finally resulting in the fatigue break, which these shafts manifest on fracture. The softer steel shafts will bend and at times even take a permanent set, but there is no doubt but that the increased ductility accounts for their being longer lived. When a plant has an unusual number of breakages of this nature, and if it is certain no foreign material has gone through the crusher, an investigation should be made by a competent party, as such a condition can generally be corrected either by a change of steel or by special heat treatment.

I understand some gyratory crushers are being redesigned in order to permit shortening of these shafts, and that these shorter shafts are reducing the breakages to a considerable extent.

Buyers Need to Know Steels

I can easily imagine how the cement plant engineer, or the engineer building machinery, who might interview six to a dozen representatives from as many different steel concerns, could become confused when attempting to boil down the diversified information received. The same thing would happen if the writer were in the market for cement, and with his limited knowledge of this product would have difficulty deciding whose cement was best after interviewing representatives from as many cement companies. I would probably purchase from the lowest bidder, and no doubt obtain just what I paid for, namely, an inferior product. The enthusiastic steel salesman may elaborate on the wonderful physical properties of a special alloy steel, representing results obtained from a small test bar, and leave the cement engineer to believe that

(*Continued on page* 388)

Detroit Facing a Serious Fuel Situation

Many Iron, Steel and Other Plants Have Nearly Exhausted Their Supplies—The Detroit Employment Curve in 1920-22—Some Signs of Slackening

(Editorial Correspondence)

DETROIT, Aug. 5.—The labor situation is uppermost in the minds of manufacturers everywhere and Detroit is no exception to the rule, for there is grave apprehension here as to what will happen to the industries of this city within a very short time unless both the railroad and coal strikes are settled. Detroit is so located that in times of congestion on the railroads the coal shortage is likely to become very serious and to-day many plants have almost exhausted their supplies of coal. The Ford Motor Co. announces that its supply will last but 14 days, and it has made a strong appeal for priority in the shipment of coal to its plants, not only on its own account, but because other industries are dependent upon it.

If the great Ford plants are closed, many foundries and other plants will be thrown into idleness. Detroit's chief hope for relief rested upon the ability of Henry Ford to make an arrangement so that his railroad, the Detroit, Toledo & Ironton, would be able to carry coal from the Kentucky fields to Detroit. The Louisville & Nashville some time ago declined to enter into such an arrangement with the Ford line, and another appeal made this week was likewise declined to-day. There are 6000 cars loaded with coal at Corbin, Ky., and if a way can be found to deliver this coal to Detroit, relief will be afforded, but no plan for this is now under consideration.

A representative of the Semet-Solvay Co., on which the Detroit Iron & Steel Co., public utilities and many industries depend for coke, told me yesterday that unless there is a decided change for the better next week the company will be compelled to cease operations within 12 days. He said that no coal is being received now and that within two weeks it would not have more than enough on hand to keep the by-product ovens warm. Representatives of public utilities, including the electric light company, say that unless they obtain larger supplies of coal within a few days it will be necessary for them to curtail their service.

Employment in 1920-1922

The accompanying chart, compiled by the Employers' Association of Detroit from reports of the number of employees submitted each week by 79 firms whose employing strength includes approximately two-thirds of the working population of Detroit, shows that in

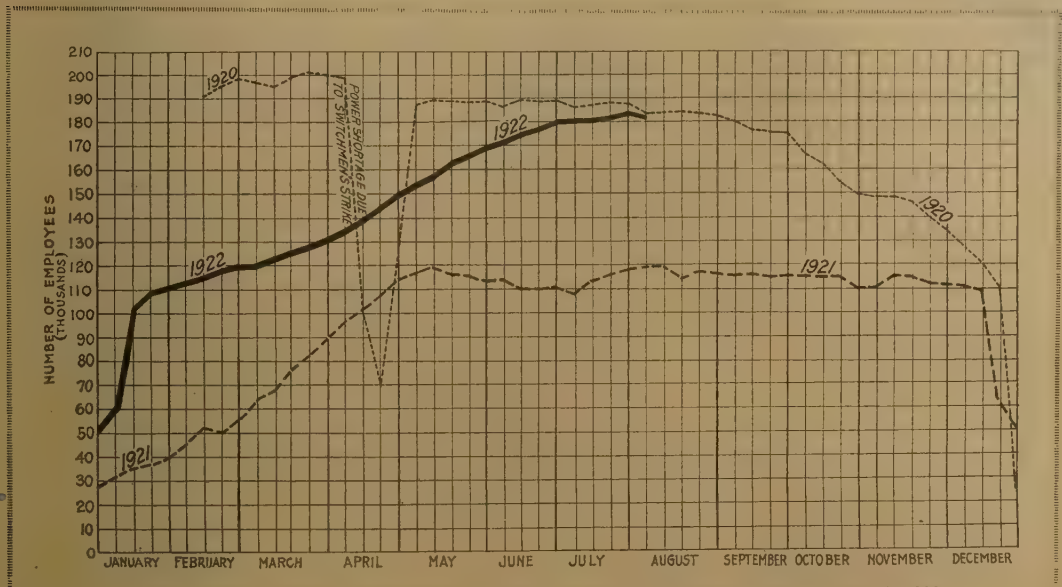


Chart Showing Number of Employees in Detroit Plants from February, 1920, to Aug. 5, 1922

1920 nearly 200,000 men were employed until early in April, when, owing to the switchmen's strike, the number rapidly declined to about 70,000 and then advanced quickly to 190,000 about the middle of May, continuing without much decline until the first of August. Then came the slump which resulted in only about 25,000 men being employed at the close of the year. In 1921 the number of employees increased steadily from 25,000 in January until it touched nearly 120,000 in May, and continued with little change until about Dec. 15, when there was a sharp decline to about 50,000 men. In 1922, the change for the better started immediately after the first of the year and continued until Aug. 1, when nearly 185,000 men were busily engaged.

This week, for the first time in months, the number of employed has declined and this fact has been viewed with some apprehension by a few observers, but it would be indeed surprising if some men were not thrown out of work at the present time and the best informed observers say that the showing of the past week is indeed remarkably favorable. What will happen in another week is problematical. There may be a decrease in employment like that of April, 1920, since there is a shortage of not only coal but of pig iron and other raw materials. Numerous foundries are on the verge of shutting down, at least temporarily, and Detroit furnace operators are at their wits' end trying to devise means of keeping the foundries supplied with

iron. Prices have advanced in harmony with the advances in other cities, but this fact does not deter foundrymen from placing orders when they are able to do so.

Satisfactory Industrial Relations

Except for the troubles which have arisen from the coal and railroad strikes, Detroit is enjoying very satisfactory relations of employers and employees. At one time last year there were 40,000 idle men in this city. Within a few months, virtually all of those men who wanted work were employed and in addition 60,000 other men have been added to the payrolls. All of this has been done without serious friction. There have been no strikes and labor has been well paid.

Detroit Iron & Steel Co. Operations

The one active blast furnace of the Detroit Iron & Steel Co. has been almost the sole reliance of many malleable and gray iron foundries for some time past. It has been running on malleable recently and goes on foundry to-day. A visit to the plant on Zug Island shows that the other stack, which was put out of commission by a serious explosion last winter, has been placed in repair and is in fine condition to resume, but owing to the coal and railroad strikes no definite date has been set.

Standing on the dock, one can see the modern equipment of the company, designed for handling a large amount of ore which must be transferred to barges for shipment up the River Rouge to the Ford blast furnaces. Fully 300,000 tons will be moved before Nov. 1. At another point on the river ore sold to the Ford company by Clement K. Quinn is being loaded on barges. His contract calls for the delivery of over 200,000 tons this season.

Across the river, one sees the two nearly completed furnaces of the Canadian Steel Corporation at Ojibway. The ore dock at Ojibway has been completed, but the blowing engines have not been installed and it probably will be a number of months before any iron is made by this subsidiary of the Steel Corporation.

Data for the Steel Institute Committee

An immense amount of information is being collected at a number of points in the Central West for the use of the committee appointed last May by the American Iron and Steel Institute to consider plans for reducing the hours of labor in the steel plants of the country. Many clerks are engaged in collecting the data, which will consist not only of statistics but also of opinions of superintendents and others who have had practical experience in steel plants.

There is a strong feeling, however, that the present is not opportune for the introduction of the eight-hour day, on account of the shortage of labor which prevails everywhere. An important operating official in another city, who is in sympathy with the movement for the introduction of shorter hours, told me the other day that it would be utterly useless to try to make the change until labor becomes more abundant. The wire mills particularly are suffering on account of the shortage.

Many wire drawers who are receiving big wages work two or three days a week and cannot be induced to work the rest of the week because they are entirely satisfied with the money which they are paid for two or three days and prefer to loaf the rest of the time.

The Seniority Problem

Sentiment among employers in the Central West is overwhelmingly favorable to the attitude of the railroads in standing firmly for the seniority rights of the men who have been employed since the strike was started and there is general regret at President Harding's view of the principle involved. Newspapers are filled with advertisements of the railroads, appealing for men to work in the shops and promising them permanent employment. If, after this kind of advertising, the railroads were to desert the new men, they would be subject to the severest condemnation. There is, however, a feeling that if the strike were declared off to-day, the seniority question would settle itself in a way that would be satisfactory to at least a large number of the strikers upon their return. It is known that many of the men who have gone into the shops do not expect to become permanent employees. Among the men of this class are large numbers of college students, who, seeing a way to earn large wages for a few weeks, are glad to do so, and they are making from $7 to $14 per day. But they will drop out as soon as college opens in September. Parenthetically it may be remarked that these boys are making good, for the product which they are turning out is much greater than that of the ordinary railroad employee. There are many other men who would leave their jobs voluntarily upon the return of the strikers and it is probable that by Oct. 1 only a small percentage of the so-called strikebreakers would continue at work. This, however, does not affect the principle involved, or relieve the railroads of their solemn duty to protect any of the new men who may wish to continue permanently in their present jobs.

G. S.

Iron and Steel in Pennsylvania

Evidence of the predominance of iron and steel among the industries of Pennsylvania is afforded by the annual report for the year 1920 of the Department of Internal Affairs. The outstanding features of this report bearing upon this particular topic are shown in our table. The number of establishments manufacturing metals and metal products was considerably greater than the number in any other industry, and was nearly 16 per cent of the total in the state. The establishments were of considerably greater average size than for the rest of the industries, the capital investment per plant being $517,700 in iron and steel, against only $167,800 in other industries. The value of products per plant was $1,218,000 in iron and steel against $277,700 in other industries. Not only was the value of products much greater per plant, but the value of products in the iron and steel industry for each $1,000 invested in the plant was higher, being $2,360 against $1,655 for other industries.

While the wages paid in the iron and steel industry were only 17.35 per cent of the total value of products against 24.67 per cent in other industries, the total wages earned per wage earner were greater in iron and steel, amounting to $1,724 against $1,354 for other industries.

	Total Industries in Pennsylvania	Metals and Metal Products	Per Cent of Total	Industries Other Than Metals
Establishments, number	26,077	4,089	15.68	21,988
Operation, average days	278	290	....	268
Capital invested, thousands	$5,799,516	$2,110,375	36.39	$3,689,141
Value of products, thousands	11,086,748	4,980,105	44.92	6,106,643
Wages paid, thousands	2,370,758	864,056	36.45	1,506,702
Wages and salaries, thousands	2,757,443	1,017,659	36.90	1,739,784
Wage earners, number	1,614,099	501,169	31.05	1,112,930
Employees, total number	1,795,055	570,026	31.76	1,225,029
Derived Quantities				
Capital invested, per plant	$222,390	$513,700	....	$167,800
Value of products, per plant	425,100	1,218,000	....	277,700
Value of products, per $1,000 invested	1,912	2,360	....	1,655
Wages paid, per plant	90,900	211,300	....	68,525
Wages paid, per wage earner	1,469	1,724	....	1,354
Wages paid, per operating day	5.29	5.95	....	5.05
Wages paid, per cent of value of products	21.39	17.35	....	24.67

Industrial activity in Bridgeport, Conn., based on 31 factories and reported by the Manufacturers' Association, shows that in the week ended July 29 the number of employees was 60.8 per cent of normal. The number of man-hours was 59.8 per cent of normal, and the average factory hours per week were 99.8 per cent of normal. The average hours worked per employee during that week were 48.2, while the average factory hours were 48.9 during the week. Normal is based on estimates of the individual factories and represents a total of 25,218 employees.

Regulators for Foundry Air Squeezers

The accompanying illustration shows two pressure regulators and a service valve connected in the manner recommended for use on air squeezers for foundry work, the unit being offered by the Canton Pneumatic Tool Co., Canton, Ohio. Arranged as shown, the outfit gives two pressures, each lower than the initial pressure.

The service valve, shown at the left in the assembly, under the handle, is of the disk type. Air is admitted through a fine screen in the bottom of the valve and the bronze disk is pressed firmly against the upper section of the valve by the air pressure. All of the openings are tapped for ¾ in. pipe. The exhaust may be turned in any direction, the air passing through

Pressure Regulators and Service Valve for Use on Squeezers. Two pressures are available, each lower than the initial pressure

other ports in the valve instead of through the regulators. The weight of the service valve is 8½ lb.

The pressure regulator was designed especially for use on air squeezers. It is said to be more reliable and economical than a pop valve, and being entirely mechanical in its action, more uniform results are obtainable than with a pressure gage and the most careful operator. There is no diaphragm or auxiliary valve. Simplicity of construction, durability and convenient installation are features emphasized. Adjustment for pressures from 40 lb. to the initial pressure is made by a screw provided for the purpose. The regulator is calibrated so that no gage is required. The body and piston are of brass and the piston is the only moving part. Openings are for ¾ in. pipe.

It is emphasized that to exhaust air rapidly the company's service valve must be used in connection with the regulators. Using only one regulator with the valve gives initial pressure from one side of the valve and a lower pressure from the side to which the regulator is attached.

Fire Clay and Silica Brick Prices Advanced

PITTSBURGH, Aug. 7.—There has been a general advance in all districts of $3 per 1000 in the price of fire clay brick and $5 per 1000 for Pennsylvania and Chicago silica brick and $3 in Birmingham silica brick. This development finds its chief explanation in the rising costs of fuel and labor.

In the Chicago district the silica brick manufacturers are now obliged to pay as high as $10 per ton for coal, and as it is claimed that two tons of coal are required for producing 1000 brick, there is an indicated increase in cost of $10 per 1000. The situation in this respect in Pennsylvania and Birmingham is not quite so bad. Most manufacturers in these districts own their own coal mines and, as they usually have only a short haul from the mines to the brick plants, the delivered cost of fuel is not increased as much as in the Middle West.

Manufacturers have found it necessary to make substantial wage increases in order to hold their working organizations and it is claimed that even this move has not been entirely successful, because of the more remunerative scales prevailing in other lines of business.

The new minimum on fire clay brick now is $35 per 1000, f.o.b. works. The new prices apply to requirement contracts carrying prices at time of shipment, but do not affect such business as is on the books of manufacturers placed at stated prices. Prices on magnesite and chrome brick are unchanged. On account of the restrictive influence on blast furnace and steel plant operation of the coal and railroad strikes, business in refractories has dwindled to rather moderate proportions.

We quote per 1000 f.o.b. works:

Fire Clay	High Duty	Moderate Duty
Pennsylvania	$35.00 to $38.00	$31.00 to $35.00
Ohio	35.00 to 38.00	31.00 to 35.00
Kentucky	35.00 to 38.00	30.00 to 34.00
Illinois	35.00 to 37.00	32.00 to 34.00
Missouri	35.00 to 37.00	30.00 to 34.00
Silica Brick		
Pennsylvania		38.00 to 40.00
Chicago		46.00
Birmingham		43.00
Standard size per net ton (f.o.b. Baltimore and Chester, Pa.)		56.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)		30.00
Chrome Brick		
Standard size, per net ton		42.00

Lake Ore Movement in July

Lake Superior iron ore shipments from the upper lake ports in July were 8,942,336 gross tons or 4,894,649 tons in excess of those for July, 1921, or an increase of 120.92 per cent. The total of this season's shipments to Aug. 1 was 17,293,513 tons, which compares with 10,418,914 tons to Aug. 1, 1921. The shipments by ports and for the season in 1921 and 1922 are as follows:

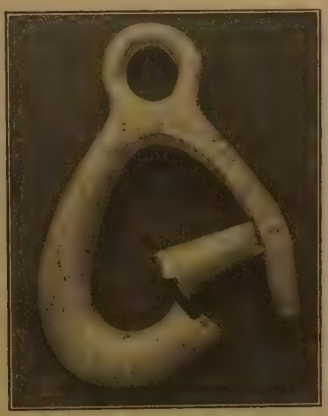
	July, 1921	July, 1922	To Aug. 1 1921	To Aug. 1 1922
Escanaba	238,258	799,536	449,062	1,604,130
Marquette	80,470	454,221	133,414	848,765
Ashland	434,088	1,379,608	961,025	2,579,056
Superior	875,005	2,010,368	2,591,235	4,364,963
Duluth	1,731,094	2,872,882	4,639,393	5,126,745
Two Harbors	688,772	1,425,721	1,644,785	2,769,854
Totals	4,047,687	8,942,336	10,418,914	17,293,513
Increase, 1922		4,894,669		6,874,599

The increase to Aug. 1, this year, in the season shipments was 6,874,599 tons or 65.98 per cent as compared with last year. Duluth contributed 29.64 per cent of the total against 44.53 per cent a year ago. Escanaba and Ashland made substantial gains this year.

Safety Hook for Mill and Cargo Use

A hoisting hook known as the Smith safety cargo hook, and which as the name implies, is intended to provide for safer operation than afforded by hooks of the usual design, is being offered by the Smith Forge Co., Camden, N. J.

The device is shown in the accompanying illustration. The outstanding features are the self attaching and locking catch; plumb balance, which eliminates the near approach for attaching the hook to the crucible,



Safety Hoisting Hook. The features include the self-attaching and locking catch and the plumb balance, which eliminates near approach in attaching the hook to the crucible

bucket or other object to be hoisted; and the guide butt, which facilitates attaching the hook and also prevents it from catching on projections during the hoisting operation.

A device of this kind aids materially in reducing the risks incident to handling molten metal. The hook is self attaching and it is not necessary to approach the ladle to make the hook fast. The hook is merely lowered over the handle or sling of the bucket or ladle, and it automatically locks. It is of steel, drop-forged, and available in four sizes, from one to six tons.

COAL, COKE AND ORE STORAGE

Diagram and Formulas for Calculation — Table Gives Certain Specific Examples

BY A. D. WILLIAMS*

IT is often necessary to estimate the storage capacity that may be secured on a certain area available. The general practice of obtaining estimates from the manufacturers of the cranes and bridges may require more time than is available, or may not be desirable in the case where only a preliminary estimate is desired, to compare different localities. The following data will be convenient for this purpose, and is accurate enough to permit the comparison of various sites.

Bituminous coal, per gross ton (2240 lb.) = 43 cu. ft.

Storage capacity for coke = 0.6 capacity for bituminous coal; ore = 2.25 capacity for bituminous coal.

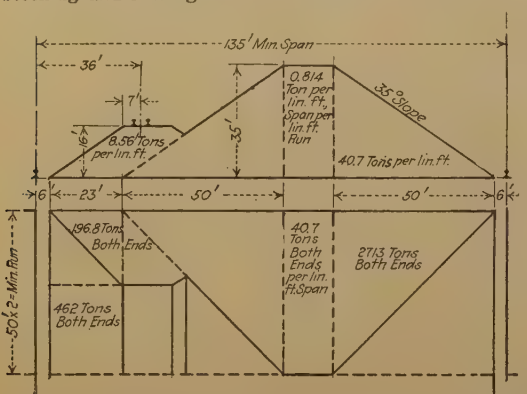
Anthracite coal = 1.10 capacity for bituminous coal.

Slope angle = 35 deg. Height of pile = 35 ft.

R = length of run or bridge travel in feet; minimum = 100 ft.

S = span between runway rails in feet.

There are two cases to be considered: 1—When the stocking and loading tracks are located under a cantilever at the end of the bridge. In this case the minimum span is 112 ft., giving 6 ft. clear between the bottom of the slope and the track. For this case the minimum run (100 ft.) gives a storage capacity of 2713 tons for the minimum span—for the pile will be a pyramid 100 ft. square and 35 ft. high, and $\frac{100 \times 100 \times 35}{3 \times 43} = 2713$. For a greater run and span, tons, total = $2713 + [40(S - 112)] + [40 + [0.8(S - 112)]] \times (R - 100)$. The table gives typical examples.



Diagrammatic Representation of Pile of Bituminous Coal with Stocking Track on a Trestle 16 Ft. Off the Ground. The tonnage figures shown permit quick calculation of contents of pile for any reasonable length and width

Capacities in Gross Tons of Typical Rectangular Piles (Without Track Raised on Trestle)

Ground Dimensions of Pile	Bituminous Coal	Anthracite Coal	Coke	Iron Ore
100 x 100 ft.....	2,713	2,984	1,628	6,104
100 x 200 ft.....	6,783	7,461	4,070	15,251
100 x 500 ft.....	18,992	20,891	11,395	42,732
100 x 1000 ft.....	39,341	43,275	23,605	88,517
120 x 200 ft.....	9,225	10,147	5,535	20,756
120 x 500 ft.....	26,318	28,950	15,791	59,216
120 x 1000 ft.....	54,806	60,287	32,884	123,314
150 x 200 ft.....	12,888	14,177	7,733	28,998
150 x 500 ft.....	37,307	41,038	22,384	83,941
150 x 1000 ft.....	78,004	85,805	46,802	175,509

2—When the stocking track is located on a trestle 16 ft. high above the base of the pile and under the bridge the minimum span is 135 ft., which for a minimum run (100 ft.) gives a storage capacity of 3372 tons. This is illustrated. For a greater run and span, tons, total = $3372 + [40(S - 135)] + [40 + [0.8(S - 135]] \times (R - 100)$.

Both the above cases refer to bituminus coal. The other materials mentioned may be substituted by using the factors given.

The total length of track required will be:

$L = R + 10 +$ wheel base of gantry.

As a general proposition, a wide pile is more economical in operation, owing to the greater tonnage which may be handled without moving the bridge. Long span bridges, however, are costly and it is a case of balancing bridge cost and runway cost to obtain the maximum storage with the minimum of investment.

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To Report on Three-Shift Day

Findings in a nation-wide survey of the three-shift day in American industry will be placed before the executive board of the American Engineering Council of the Federated American Engineering Societies, at a meeting of the board to be held in Boston, Sept. 8 and 9.

Two reports, dealing with exhaustive investigations of the two-shift and the three-shift day problems in numerous industries, including metal working, mining and others, will be presented. One, prepared by Horace B. Drury, formerly of the faculty of Ohio State University, will describe the extent of two-shift operation in the continuous industries as well as the procedure followed and the results noted by those companies which have changed from the two-shift day of twelve hours each to the three-shift day of eight hours each. Mr. Drury's report will discuss the general practicability of abolishing twelve-hour turns.

A second report on an investigation of the modus operandi involved in changing the operations of a steel plant from two-shift to three-shift methods will be made by Bradley Stoughton, former secretary of the American Institute of Mining and Metallurgical Engineers. Both investigations are being directed by the American Engineering Council's committee on work periods in continuous-operation industries, of which H. E. Howe, Washington, president of the American Chemical Society, is chairman.

The findings of the committee, which are expected to be a notable contribution to the facts of present-day industry, will be presented to the Boston meeting of the engineering board, composed of engineers from all parts of the country, for definite action. A preliminary report by Mr. Drury estimates that "very roughly, the number of shift workers in the United States is probably well over 500,000, though likely not as large as 1,000,000." Industries of the South and the Far West are included in the survey as well as the industries of the East and Middle West.

The number of men on 12-hr. shifts in the period preceding the industrial depression was given as "perhaps not far from 300,000, of which about as many were outside the steel industry as within it." The committee, according to the investigators, "has been endeavoring to chart what is practically an unexplored field."

Mortimer E. Cooley, dean of the engineering schools of the University of Michigan, and successor of Herbert Hoover as president of the federation, will preside at the executive board meeting.

Metal Corrosion Studies

A study of film formations on metals under corrosion conditions will be made by the Bureau of Mines at Pittsburgh as a part of the general program of the study of corrosion of metals by acid mine waters. A study will be made of the formation of surface films on metals and alloys when exposed to corroding media, and an examination will be made of the effect of such films on corrosion inhibition. R. J. Anderson, metallurgist, and James R. Adams, research fellow of the Carnegie Institute of Technology, have been detailed for the work.

A research bulletin on the "Effect of Impurities on the Oxidation and Swelling of Zinc-Aluminum Alloys," has been issued by the New Jersey Zinc Co., 160 Front Street, New York. The authors are H. E. Brauer and W. M. Pierce of the company's research division.

Shaper Used in Planing Bearing Seats

A regular shop production job previously done on a planer, but at present handled on a 24-in. Gould & Eberhard shaper, the change being said to result in a saving of 30 per cent in the time for handling and setting up the casting, as well as a saving in machining costs, is shown in the accompanying illustration.

The operation consists in planing the bearing seats for the caps on 6- x 6-in. compressor frames built by the Brunswick Refrigerator Co., New Brunswick, N. J. The two sides of one bearing are planed, the casting being then turned through 180 deg. bringing the opposite bearing in place for machining.

A special extension tool holder with an over-reach of 6 in. beyond the regular tool position is used. This

Shaper Used in Machining the Bearing Seats for the Caps on Compressor Frames

permits the tool to plane the entire length, 4⅝ in., of the bearing without interference of the shaper head with the compressor frame, the sides of the frame being too close together to permit the shaper head or ram to pass through.

Engineers to Discuss Economics

The economics of industry has been selected as the major subject of the ninth national convention of the Society of Industrial Engineers to be held in New York at the Hotel McAlpin, Oct. 18 to 20. An address at the opening meeting will be on the relation of economics to industry and another on economics' part in the formation of a policy of business administration.

An evening meeting will be devoted entirely to addresses on "The Budget and the Financial Forecast," "The Business Cycle," and "The Importance of the Elimination of Waste to the Economic Structure," the latter address to be made by L. W. Wallace, executive secretary Federated American Engineering Societies. "Two Important Economic Factors" is the topic selected for an afternoon meeting, 15 min. papers by executives and workmen, followed by discussion being scheduled, the papers and discussions to be on specific subjects of "How We Can Reduce Production Costs," and "How Can We Keep the Worker Contented."

Sectional meetings for managing executives, production managers, sales managers, industrial relations directors, accountants and educators are included in the program as heretofore, and the International Committee for the Elimination of Unnecessary Fatigue will hold an open meeting.

The banquet will be held on Thursday evening, Oct. 19, with Prof. Joseph W. Roe, president of the society, as toastmaster. The addresses will include "The Relation of the Economist to Business," and "Finance and Industrial Economics." At an afternoon meeting the society will be addressed on the "Economic Aspect of Production," and on the subject of "The Industrial Age."

A special feature will be an exhibition of factory and office equipment and appliances designed to save labor and reduce fatigue, which will be held in a room adjoining that in which the principal meetings will be held.

On the evening before the convention, there will be a joint meeting of the society with the Taylor Society and the American Society of Mechanical Engineers.

Eighth Annual Chemical Exposition

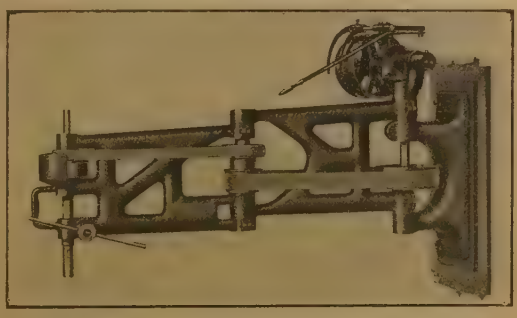
Preparations are going on for the eighth national exposition of chemical industries at the Grand Central Palace, New York, Sept. 11 to 16. A large list of exhibitors has been already announced and nearly all the space has been taken. Besides technical sessions, 15 feature films on chemical and other industrial subjects have been scheduled, some of them being shown for the first time. Among them are the "Story of Sulphur," "Story of Heavy Excavating Machinery," "Story of Air Reduction" and the "Story of Natural Gas."

New Wall or Post Bracket Drill

A new wall or post bracket drill covering a radius of 3½ ft. and designed for light drilling operations, being especially adapted to stove work, electrical and switchboard work, has been brought out by the Hammond Mfg. Co., Cleveland. The drilling capacity in steel is ⅜ in.

The general construction may be seen from the accompanying illustration. The drive is through the tight and loose pulley countershaft and bevel gears to an upright shaft. The countershaft yoke can be set to any position to conform to overhead drive, and is provided with convenient belt shifter. The arms swing on stationary sleeves, an arrangement intended to prevent undue pressure on the driving shafts. The spindle is equipped with a ball thrust bearing. The spindle quill is of steel with bushed bearings and is provided with a rack cut from solid. A spring counterbalance is provided.

The machine is equipped with belts as shown, and with belt guard for the spindle pulley. The traverse of



Bracket Drill for Light Drilling Operations. The capacity is ⅜ in. in steel

the spindle is 2½ in. The hole in the spindle is for a No. 2 Morse taper. The pulleys are 8 in. in dia. and run at 400 r.p.m., the spindle speeds being 500 and 1300 r.p.m. The shipping weight in 250 lb.

Federated Engineering Societies Adds Members

The Engineers' Club of Louisville, Ky., has applied for membership to the Federated Engineering Societies and the committee on procedure has approved the application.

Among the notable additions to the federation is the Engineers' Club of Columbus, Ohio, which has appointed Prof. James R. Withrow of Ohio State University as its representative on the American Engineering Council.

Anti-Friction Bearings in the Steel Mill

Mounting Details of Ball and Roller Bearings—Use and Care of Ball Bearings—Provision for Lubrication

BY A. M. MAC CUTCHEON

(*Continued from page* 268, *Aug.* 3)

IN successfully designing a mounting of an anti-friction bearing motor, the following points must be kept in mind:

a. Ease of assembly. It should be possible to draw the bearing off the shaft without transmitting pressure from the outer race to the inner race through the ball. It should be possible to remove the armature without removing the bearing from the shaft.

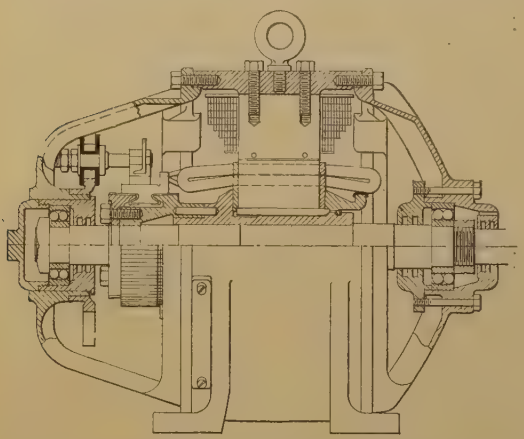


Fig. 3. Typical Ball Bearing Mounting on General Service Direct Current Motor

b. The bearing should be protected against the entrance of dirt or grit. If such foreign substances are present within the bearing, its life will be short.

c. The lubricant must be retained within the bearing housing.

d. The bearing must be the proper fit on the shaft and within the housing.

e. The inner race of the bearing must be locked in place, against a suitable shoulder, by a suitable locking nut.

Fig. 3 represents a typical mounting on a general service direct current motor. At the commutator end the bearing is entirely inclosed in a cartridge which is removed from the motor with the armature. Such inclosure is believed the most satisfactory form of mounting, but is somewhat expensive. The armature may be entirely removed from the motor without disturbing the fit of the ball bearing on the shaft. A suitable mounting is always difficult at the commutator end of a direct current motor of the general service type, since the outer dimensions of the bearing housing are limited by the position of the rocker. Fig. 4 is a composite mounting, showing the application of a ball or roller bearing to the same motor.

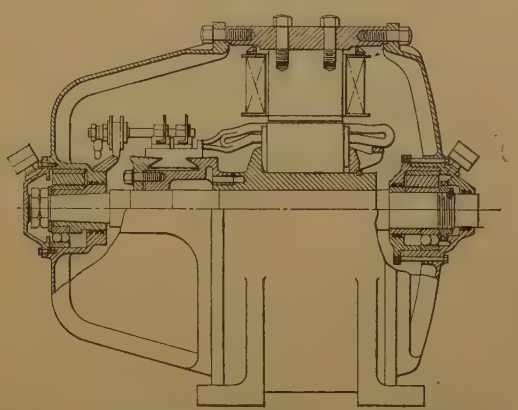


Fig. 4. Composite Mounting Using Both Balls and Rollers in the Bearing

Fig. 5 shows a typical mounting of a vertical general service motor, in which the armature weight is carried by a thrust ball bearing at the top.

Fig. 6 is an application of a ball bearing to a mill type motor. The bearing is completely inclosed in a cartridge, which is removed from the motor with the armature, effectively excluding foreign substances. This application was laid out in connection with changing over oil-type motors to anti-friction type. The ball bearing is mounted on a sleeve driven by a Woodruff key. The sleeve has the advantage of a long bearing on the shaft, and may be required in very heavy service.

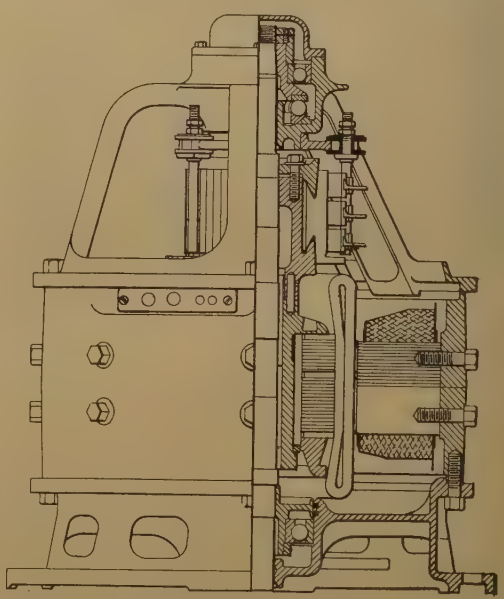


Fig. 5. Vertical Ball Bearing Mounting on General Service Motor

Fig. 7 represents the mounting of a ball bearing in a steel mill motor, with the bearing carried directly on the shaft, and without the cartridge inclosing the bearing. Unusually complete protection is provided against the escape of grease by what may be described as the "labyrinth" type of groove. As nearly all types of anti-friction bearings will take a considerable end thrust, from 30 or 40 per cent of the radial capacity of the bearing up to 100 per cent or over, it is not necessary to provide any other device to take the end thrust ordinarily found in motors.

Fig. 8 shows an application to a general service motor with the "labyrinth" type of grease groove; but as this mounting does not permit removal of the armature without the removal of the bearings from the shaft,

it is not to be recommended—certainly not in a steel plant.

Fig. 9 shows the application of a tapered roller bearing with the bearing completely inclosed in a cartridge. Disassembly is accomplished by removing the outer cap screws, and rotating the cartridge so that the extended bosses will clear the extended bosses on the bracket. Wear on such a bearing may be compensated for by removing shims between the outer and inner inclosing caps.

Fig. 10 represents the installation of a tapered roller

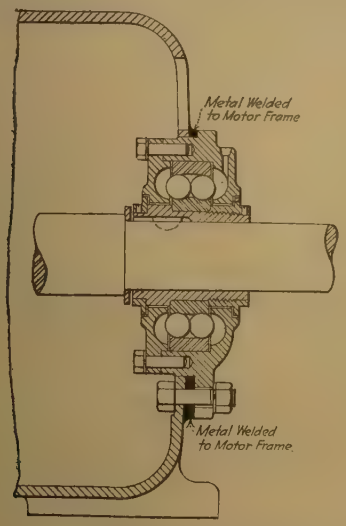


Fig. 6. Ball Bearing Mounting, on Mill Type Motor, Inclosed in Cartridge

bearing in a split frame motor. The armature may then be removed by lifting the top half of the frame. The shims for adjustment after wear are again evident.

Consideration should be given to allowing a fair-sized space for lubricant, and to its introduction through a tapped hole closed with a pipe plug, a grease cup or other suitable means. All ball bearing manufacturers seem to be in accord that the inner race should be

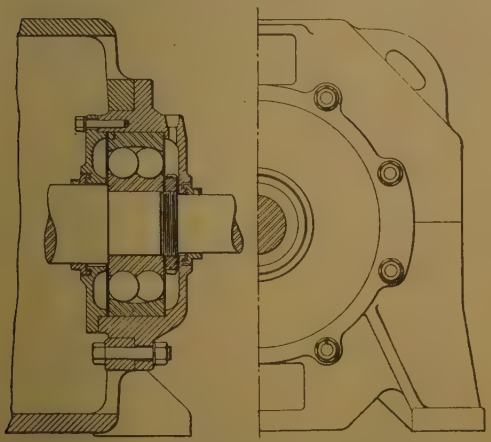


Fig. 7. Ball Bearing Mounting on Mill Type Motor, with Bearing Carried Directly on the Shaft

mounted on the shaft with a light drive fit, from 0.0006 to 0.002 force, depending upon the size of the shaft. The outer race should be a sucking fit in its housing, permitting a slight creepage of the outer race if such a tendency is present. The end play should be taken on one bearing, and the one carrying the heavier load is preferable. Either grease or oil may be used for lubrication; for speeds up to 2000 r.p.m. on 5 to 20-hp. motors, grease is recommended, because of the advantage in eliminating any possibility of oil getting into the motor. At very high peripheral speed oil is found preferable.

Great care must be exercised to protect the ball bearing before installation in the motor, and during

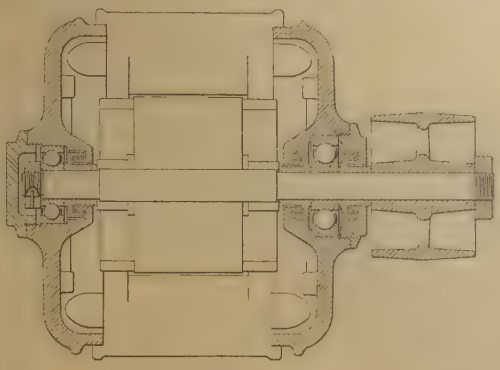


Fig. 8. Ball Bearing Mounting Fitted with Labyrinth Type Grease Grooves

the process of assembly, against the entrance of grit or foreign substance, as the presence of such substance will most certainly result in wear and the eventual failure of the bearing. If the armature is removed from the frame with the bearing not inclosed in a cartridge, the bearing should be carefully wrapped while the armature is out of the motor. To offset this, it is claimed that very little attention need be given the lubrication of the bearing while the motor is in operation. There are cases where anti-friction bearings have operated over a period of three to four years, without being greased. This is, of course, not recommended. Speed and heat conditions are the governing factors. Wherever possible, grease should be applied at intervals of about six months.

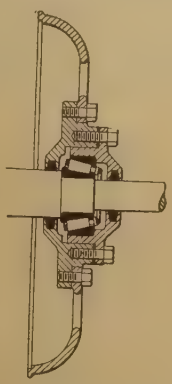


Fig. 9. Tapered Roller Bearing Completely Inclosed in a Cartridge

Probably the best practice would be for the operator to make monthly inspections at the time of the installation, in order to judge how long the lubricant will remain serviceable under the conditions existing in his particular plant, and then establish a period for applying grease. In no case should the housing be packed full of grease, as this will cause severe heating in operation. It is the prac-

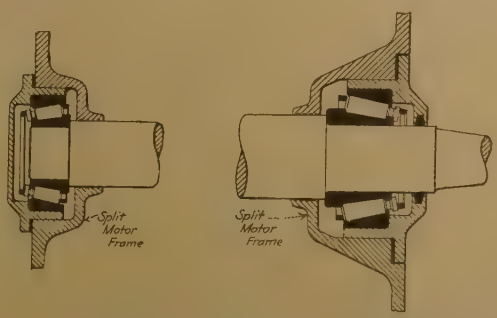


Fig. 10. Tapered Roller Bearing in a Split Frame Motor, Permitting Easy Removal of the Armature

tice of the ball bearing manufacturers to slush bearings with a coating, to avoid rust. Before installation, they should be cleaned with gasoline to remove this slush, as it is not a good lubricant, and under certain conditions will cause heating.

(To be concluded)

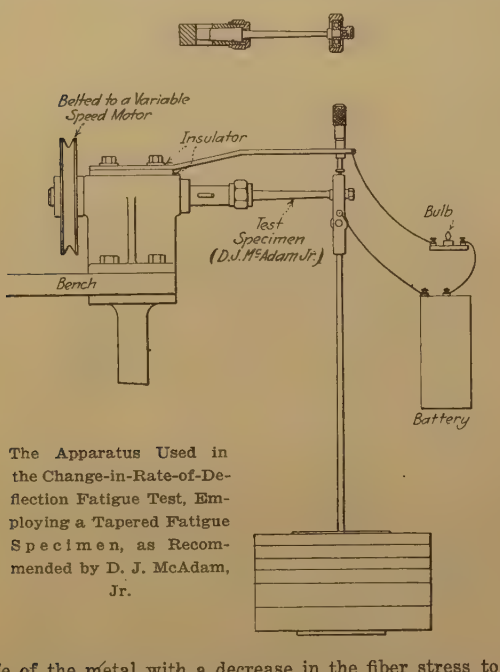
NON-FERROUS METAL FATIGUE*

Present Status of the Knowledge of the Fatigue Strength of Some Aluminum and Magnesium Alloys

BY R. L. TEMPLIN

AT the present writing, all of the fatigue investigations on the wrought ferrous metals have indicated that there is at least a practical endurance limit, at and below which the metal will withstand an indefinitely large number of repetitions of stress without failure. The same laws that obtain in the case of the wrought ferrous metals, however, apparently do not hold in the case of at least some of the non-ferrous metals.

It is quite true that the available fatigue data for the wrought non-ferrous metals are rather meager, but such as there are indicate an increase in the life of the metal with a decrease in the fiber stress to a point where an apparent endurance limit is reached. At this point the *SN* diagram becomes horizontal or nearly so, and stays so up to a second point, where the slope of the *SN* diagram again changes to a value approximating the slope of the first part of the curve. That is, there is a sort of an arrest in the curve, which in the case of duralumin may start at from 2×10^6 to 7×10^6 repetitions of stress and extend to 2×10^7 plus repetitions of stress.



The Apparatus Used in the Change-in-Rate-of-Deflection Fatigue Test, Employing a Tapered Fatigue Specimen, as Recommended by D. J. McAdam, Jr.

More long time fatigue tests are necessary and are being made to establish the certainty of this kink in the *SN* diagram for wrought non-ferrous metals. It is perhaps significant that such a shape for the wrought ferrous metal curves has been rather anticipated by the joint committee on fatigue of metals, although it has not been found to date using specimens which have been tested to 7×10^8 repetitions of stress.

Some experimental work has been done in the technical direction bureau of the Aluminum Co. of America in an attempt to check or disprove the results obtained by Mr. Gough† using the change-in-rate-of-deflection method for determining the endurance limit. In these tests the tapered fatigue specimen, style E, as recommended by D. J. McAdam, Jr.‡ together with test apparatus as shown schematically in the illustration was used.

Tests were made on hard rolled 17S [aluminum alloy of the Aluminum Co. of America], heat treated 17S and aluminum-magnesium alloy rod using speeds of rotations of approximately 100, 400, 1000 and 1400 r.p.m. In every instance a straight line deflection curve was obtained up to a point considerably above the proportional limit as determined by the Ewing extensometer and plotting the stress strain values to the scale 1 in. = 5000 lb. per sq. in. (ordinates) and 1 in. = 0.002 in. per in. (abscissa). In some cases the straight line deformation persisted above the yield point of the metal.

For the routine fatigue tests, however, in the testing laboratory of the technical direction bureau of the Aluminum Co. of America, the rotating beam type fatigue testing machine is used. The machines, while considerably larger than those used by the joint committee at the University of Illinois, are quite similar and have been found to give satisfactory and consistent results. The type of specimen used in these machines for the long time fatigue tests is substantially that as used by the joint committee and when the test data derived becomes available, it should be comparable to the data obtained by the joint committee on wrought ferrous metals.

*An elaboration of the discussion of Prof. H. F. Moore's paper on "Fatigue or Progressive Failure of Metals Under Repeated Stress" at the annual convention of the American Society for Testing Materials in June at Atlantic City. The author is chief engineer of tests, research bureau, Aluminum Co. of America, New Kensington, Pa.

†"Improvements in Methods of Fatigue Testing," by H. J. Gough, B.Sc., in *Engineer*, Aug. 12, 1921, page 159.

‡"Endurance of Steel Under Repeated Stresses," by D. J. McAdam, Jr., in *Chemical and Metallurgical Engineering*, Dec. 14, 1921.

Merchant Ships Under Construction

According to returns of Lloyd's Register, the number of merchant ships under construction at the end of June was about 1016, of a total of 3,780,430 gross register tons. This includes an estimate of 150 ships and 545,000 tons for Germany. Particulars by nations will be found in the appended table. It will be noted that the British Isles are credited with just about half of the total tonnage, but it should be remarked that 25 per cent of the tonnage reported under construction in the British Isles has been suspended, no work being done on it at present. The same condition pertains to more than 40 per cent of the tonnage under construction in Italy, as well as a considerable tonnage elsewhere on the continent of Europe.

Much of the tonnage now being built in the United States is special and of a character which could not well be filled by the Shipping Board ships, at present tied up in such large numbers. As a matter of fact, almost half of the total American tonnage building consists of tank vessels intended to carry oil in bulk.

Among the steel vessels, those building in the British Isles will average 4969 tons each and those building in the United States will average 4641 tons each and those building elsewhere (outside of Germany) will average 3144 tons each. The average for the entire group is 4127 tons. The American position is well shown by the fact that Italy, France, Holland and Germany all have larger tonnages under construction than has the United States. This is, of course, due to the fact of so many Shipping Board vessels being idle.

Merchant Vessels Under Construction, June 30, 1922

	Total		Built of Steel	
	No.	Gross Tons	No.	Gross Tons
British Isles	390	1,919,504	386	1,917,957
United States	36	150,623	31	143,885
Italy	88	285,671	53	273,526
France	53	243,290	53	243,290
Holland	99	226,318	99	226,318
Japan	26	115,512	26	115,512
Scandinavia	81	145,527	73	143,302
12 other countries	93	148,985	53	130,599
Germany (est.)	150	545,000	120	500,000
Total	1,016	3,780,430	894	3,694,389

The Wickwire Spencer Steel Co. is installing some of the heavy grill making equipment from the former Wright Wire Co., Worcester, Mass., mill, in its Clinton, Mass., plant. Production of fine wire screening at the Clinton plant will continue throughout the summer and fall on a full day and night shift schedule. In previous years production was somewhat reduced during these months.

Special Strike Legislation Forecasted

House of Representatives Called for a Definite Session Regardless of Tariff Bill Situation—Putting Teeth in Transportation Act Regarded Likely

WASHINGTON, Aug. 8.—The fact that President Harding has asked the House of Representatives to remain in continuous session when it convenes next Tuesday, Aug. 15, leads to the assumption here that the Executive will ask for some special legislation to deal with the coal and railroad strikes if satisfactory progress toward a settlement has not been made by that time.

Just what form such legislation may take has not been indicated by any Administration spokesman, but it is considered likely that it will take the form of an amendment to the Transportation Act putting "teeth" in it so that a penalty will be attached to violations of decisions of the Railroad Labor Board.

The President will probably address a special message to Congress discussing the strikes, should the situation at that time seem to require drastic action on the part of the Government.

While official Washington was fairly optimistic today regarding a possible settlement of the coal strike through the results of the Cleveland meeting of operators and miners Monday, it can not be said that the same holds true of the rail situation. President Harding's latest move as voluntary negotiator has apparently not found favor with representatives of the shop mechanics' organization, while the attitude of the railroad presidents as expressed by individuals among them is not wholly one of approval.

Because of the critical nature of the present situation, the President has asked the House of Representatives to reconvene on Aug. 15, regardless of whether the tariff bill is ready by that time. When the House adjourned it was with the understanding that it would reassemble on Aug. 15 and immediately adjourn if the tariff bill was not ready for submission.

President Harding and his cabinet are making no effort to belittle the growing seriousness of the coal and rail strikes. The attitude of both sides in the railroad strike on the seniority question leaves little room for optimism that this difference can be easily compromised. Representatives of the shop men are even opposed to leaving the question to the railroad labor board for decision.

Contractors Protest Against Priority Order

WASHINGTON, Aug. 8.—That the greater part of the construction projects now under way throughout the country will be forced to shut down for lack of construction materials unless the present coal priority order is modified is the statement made to-day by the Associated General Contractors of America in a petition of protest to the Interstate Commerce Commission. The association is looking not so much to the immediate situation as to that which will prevail when the coal and railroad strikes shall have been settled.

The petition calls attention to the fact that with the reopening of the mines, the demand for coal will be not less than 320,444 cars per week. Of the maximum 324,000 serviceable cars only 291,000 will be suitable for the loading and transportation of coal, leaving only 33,000 open-top cars weekly for all other purposes. Going on the assumption that the coal and railroad strikes will be settled shortly, and that the present priority order stands, the contractors estimate the probable demand and supply of open-top cars weekly during August, September and October will be as follows:

Weekly Needs of Open Top Cars

Commodity	Demands	Supply	Per Cent Supplied
Coal	320,000	291,000	91
Sandstone and gravel	50,000	10,645	21
Ore	40,000	8,516	21
Iron and steel	25,000	5,322	22
Miscellaneous	20,000	4,258	21
Limestone	10,000	2,129	21
Coke	10,000	2,129	21

Coal Priority System Slowly Developing

Railroads and Public Utilities Take Present Production and Even with Fair Expansion of Output Some Stopping of Plants Appears Inevitable

WASHINGTON, Aug. 8.—Henry B. Spencer, Federal fuel distributer, said to THE IRON AGE that the present production of bituminous coal will take care only of classes 1 and 2 of the priority list, and that for class 4, which includes steel manufacturers, blast furnaces and industrial plants generally, there will be no coal available.

Until the working plans of the Federal fuel distribution committee are fully operative industrial users of coal may continue to get some of the supplies which they have bought, but these will gradually be cut off under the system of car allotment to mines for the prior classes and these prior wants will be taken care of before coal can be shipped to any other designation.

There are a few steel companies operating by-product coke ovens which furnish gas to municipalities, and these in all probability will get coal for coking purposes under the public utility preference, but it may be that their supply will be limited so that only as many ovens can be operated as are absolutely necessary for supplying municipal light and heat.

Coal Stocks Greatly Reduced

A survey of the coal stocks of the industrial plants of the country has been completed by the President's committee, revealing that the 400 plants from which returns were received had on Aug. 1 only 20 days coal supply. This, of course, is an average percentage, some plants having several weeks supply while others were within a few days or a week of the bottom of their coal stocks and were facing shutdowns.

With the organization plan of the fuel distribution committee completed, there was a rush to Washington by representatives of industries of all classes for priorities, but in most instances these claimants for consideration were referred to their State fuel agencies, which will take care of their wants, if possible, after the priorities which have been established under Government order are provided for.

It has been estimated that the daily consumption of bituminous coal in the United States at present is 1,600,000 tons, so that it may be seen that railroads, public utilities and industrial plants generally are eating into their stocks at an enormous rate, as the soft coal production is roughly only 4,000,000 tons a week or considerably less than half of the amount being consumed.

The railroads require at least 280,000 tons daily or half of the soft coal now being produced, while it is estimated that the public utilities of the country re-

quire 1,500,000 tons weekly, which will take most of the remaining half of present production.

Northwest Asks for 12,000,000 Tons

In addition to these pressing wants, which have been given first claim upon coal supplies by the Government's distribution plan, the Northwest, which relies on getting its winter supply of coal by way of the Great Lakes before the close of navigation, has asked for the shipment of 12,000,000 tons additional, and the fuel distribution committee is planning to begin shipments of this not later than Sept. 1. As there will then be only about 12 weeks remaining in the navigation season, this means a shipment of not less than 1,000,000 tons weekly.

Thus it will be seen that the steel industry will have very little, if any, coal to draw upon until there is an increase in production. Before the strike of railroad shopmen, the coal mines were producing about 5,500,000 tons a week and this has been brought down to less than 4,000,000 tons, though slight gains have been made in the past two weeks. In 1921, with industry operating at a much lower rate than this year, 407,000,000 tons of soft coal were mined. It is estimated that the minimum requirement of the country under present conditions is 7,000,000 tons a week and this does not allow anything for stocks which must be carried during the winter months to insure against delays in transportation due to ice and snow. Therefore, until soft coal production can be greatly increased the iron and steel industry and other manufacturing industries will have troubles which undoubtedly will become more serious while the railroad and coal strikes continue.

While it is intimated here that the steel industry because of its essential character in the maintenance of railroad transportation will have a certain degree of preference among industrial plants, this preference will amount to little or nothing until there is an increase in the coal supply. A question that has been considered this week by the fuel distribution committee is what shall be done with coal mined by steel companies in their own mines and transported in their own cars. It has been stated that no extreme measures will be resorted to unless necessary, but that the steel industry, in common with others which have been placed among the deferred priorities, will be asked to cut down voluntarily on its coal consumption.

Visits to Washington Not Advised

In this connection it may be stated that it will do little good for officials or other representatives of manufacturing plants to come to Washington in an effort to get coal. The fuel distribution committee has been obliged to turn away many who have visited Washington this week for such purpose. The time of the committee has largely been taken up with conferences and getting its program under way and members of the committee have not had the time to interview those who have come to see them. The result is that these special messengers have usually not gotten further than a clerk in the fuel distribution committee's offices, who has told them to take up such matters with the State fuel agencies, a list of which appeared in THE IRON AGE of Aug. 3, p. 299. The Government's committee will confine its work chiefly to getting coal for railroads, public utilities and States.

Another Voluntary Coal Price Agreement Proposed

WASHINGTON, Aug. 8.—Skyrocketing coal prices in Pennsylvania was the subject of a conference to-day between representatives of operating mines in that State and Secretary of Commerce Hoover and Federal Fuel Distributer Spencer. The purely voluntary price arrangement of June 1 of $3.25 to $3.50 a ton broke down two weeks ago partly due to the fact that some coal producing districts refused to co-operate in the voluntary agreement at that time and partly due to conditions brought about by the railroads offering $1.50 above the fair price for coal in the districts which did agree. Many coal operators in the districts where the voluntary agreement was made have held to the fair price, but other districts are asking as high as $7 to $8 a ton.

The operators proposed at to-day's conference that a new fair price should be fixed at a somewhat higher level than that of June 1 to allow for increased working expenses due to car shortages and partial operation of mines. Inasmuch as the bulk of Pennsylvania production is consumed in that State, it was deemed a matter in which the Pennsylvania authorities should participate. Hence a meeting has been arranged for Wednesday, Aug. 9, between Governor Sproul's State coal committee and the Administration officials for consideration of the matter.

Plan of Organization for Coal Distribution

WASHINGTON, Aug. 8.—Henry B. Spencer, the Federal fuel distributer, has announced the following plan of organization for the distribution of available coal supplies in the present emergency.

The President's fuel distribution committee, consisting of Secretary of Commerce Hoover, chairman; Attorney General Daugherty, Secretary of the Interior Fall, Commissioner Aitchison of the Interstate Commerce Commission and Federal Fuel Distributer Spencer, has appointed the following administrative committee for the purpose of directing the distribution of all available supplies among the railroads, Federal institutions and States:

H. B. Spencer, Federal Fuel Distributer, Chairman.

Staff	*Coal Operators' Advisory Committee*
Samuel Porcher, Railroad fuel.	C. E. Bockus, Chairman, Virginia.
Le Baron S. Willard, Tidewater coal.	E. E. White, Southern West Virginia.
J. N. Snider, New England and Eastern.	E. C. Mahan, Southern Appalachian.
C. E. Tuttle, Lake coal.	E. L. Douglas, Eastern Kentucky.
George F. MacGregor, Southwestern region.	William J. Magee, High volatile district of Southern West Virginia.
E. M. Durham, Jr., Southeastern region.	George R. Francis, Pennsylvania.
E. W. Thornley, Manager of orders.	
F. G. Tryon, Geological Survey.	
Lt. Com. E. A. Cobey, United States Navy.	

M. J. Gormley, American Railway Association.
J. C. Roth, Interstate Commerce Commission.
D. R. MacLeod, secretary to the committee.

In addition district committees have been created in the principal coal-producing districts for the purpose of distributing orders from the Federal fuel distributer among the mines. These committees shall consist of a representative of the fuel distributer, Interstate Commerce Commission, coal operators and the railroads. District headquarters have been established in the following coal regions:

Norton, Va.—All of Virginia except the Pocahontas district.
Bluefield, W. Va.—Pocahontas, Winding Gulf, New River, Tug River and Virginian districts.
Huntington, W. Va.—Kanawha, Logan, Williamson and Big Sandy districts.
Knoxville, Tenn.—Fields in Southeastern Kentucky outside of Harlan and Hazard; all mines in Tennessee.
Louisville, Ky.—Harlan, Hazard and Western Kentucky fields on Louisville & Nashville and Illinois Central railroads.
Birmingham, Ala.—All mines in Alabama.

Gradual Working of Priority Plan Expected

Pending the completion of this organization, three intermediate stages will ensue: 1. Continuation of their normal business by the operators; 2. Priority buyers in accordance with the Interstate Commerce Commission service order No. 23 will gradually encroach upon operators' business; 3. Coal orders placed through the Federal fuel distributer for railroad purposes and State committees will gradually absorb the total output of the mines.

This latter clause is a direct quotation from a statement given out at the Federal fuel distributer's office and indicates as clearly as anything that has been stated as to what extent industrial plants may expect

to get coal until their is a marked increase in production.

Governors of all States have been asked to create fuel committees, the orders from whom will be sent to the Federal fuel distributer here. These State committees have been asked to report to Washington a list of those who should receive priority coal for current use, not for storage, in the order of the emergency of their need; also the nature of the consumer, whether public utility or industrial plant; the amount of coal on hand and the amount required by each to maintain operation.

The State committees are expected to distribute such coal as may be allotted to them in the following order: 1. Public utilities and public institutions; 2. Household coal; 3. Industrial manufacturing public necessities; 4. Industries in general.

Until such time as priority orders from the Federal fuel distributer shall reach them, coal operators are expected to operate individually as they have been.

Coke Supply Problem

The Federal fuel distribution committee will probably consider the question of coke supply this week. The probability is that some means will be found to take coking coal and divert it to other use. A problem in this connection is what to do with coal mined by coke companies and shipped over their own lines and in their own cars direct to the coke ovens. This whole question will doubtless be decided before the end of the week.

Consumption of tin plate for food packing will not be materially affected by the coal priorities, the Federal Fuel Distributor having assured canning companies that coal will be provided for them to prevent spoilage of the large quantities of farm crops.

More Workers and Increased Coke Production in Connellsville Region

UNIONTOWN, PA., Aug. 7.—Fuel production in the Connellsville bituminous region for the week ended July 29 showed the largest tonnage since the week of April 15, when the strike situation became serious in the Fayette county region. Merchant coke producers made a larger gain for the week than did furnace coke producers. The merchant operators have been the heaviest sufferers since the beginning of the strike and the gain last week is considered significant. Fuel production in the region increased 72,700 tons, an increase of 4030 tons over the preceding week.

Outside workers continue to be imported but here and there regular employees in the region are returning to their jobs at the old or at other plants. This does not apply to the element which has affiliated with union locals. These workers, now affiliated with the union, are, if anything, even more determined than ever to remain out. They have been told that the strike in the union fields will never be settled until the union in this field is granted recognition. Inasmuch as they stand little chance of being reinstated on employment lists at plants in the region, they apparently figure that their course is to hold out for union recognition.

With increased production, coal shipments naturally are increasing. The Pennsylvania Railroad, in the week of July 29, alone handled 4706 loads, an increase of more than 700 loads over the preceding week.

That the strikers are recognizing the situation as more serious from their viewpoint is indicated in the amount of dynamiting which has been carried out during the past week. No less than three railroad bridges on lines over which fuel shipments have been increasing were dynamited, although in no instance was traffic delayed more than 24 hr. Half a dozen or more homes have been dynamited.

No Allocation of Cars As Yet

Operation of Federal distribution through allocation of cars in the Fayette County field has not been instituted but the tentative organization is ready pending actual putting into force of these regulations by the government. Price control has not been put into effect, with the result that coal is being sold for as high as $8 a ton. Wagon mines in the county are exerting every effort to get out the maximum tonnage possible before the federal price fixing gets into operation.

Production in the Connellsville region, according to observers, will approximate 28 per cent of normal. The H. C. Frick Coke Co. is operating at around 33 to 35 per cent and this is being slowly increased. Efforts are being directed at increasing production as rapidly as possible. While a few of the idle workers in the region, as stated above, have returned to work, the majority of increased output is due to imported workers. When the actual break in the county situation will come is problematical.

Railroad Shopmen's Pay Higher Than in Private Plants

The National Industrial Conference Board, 10 East Thirty-Ninth Street, New York, has made a study of the wages of the striking railroad shopmen. Railroad skilled shop mechanics include machinists, boiler makers, blacksmiths, sheet metal workers, and electrical workers, whose duties in the railroad shops are practically identical with the duties of men employed in commercial foundries and machine shops. The report resulting from the investigation just completed covers the wages of 388,560 men employed in 1338 plants, or 73 per cent of all the wage earners in foundries and machine shops, as shown by the United States Census of Manufacturers in 1919. The statement estimates the average weekly earnings of skilled railroad mechanics to be $33.67, under the reduced rates recently established by the Railroad Labor Board. The weekly wages of foundry and machine shop employees, however, on Jan. 1, 1922, were $25.08, giving the railroad employees an advantage of 32 per cent in weekly earnings over the earnings of men performing identical work in the shops of private companies. Since a decline in wages of outside shop workers has taken place since the first of the year, the position of the railroad shopmen is even more favorable. The conclusion of the Conference Board's report, briefly stated, is this:

"Railroad shopmen are in a more advantageous position than they were in 1914, in three ways: First, that their hours of employment have been reduced, giving them more time for leisure and recreation; second, that their economic status, even under the new wage cuts, is 10 per cent higher than eight years ago; and third, that the average weekly wages of railroad shopmen are at least 32 per cent higher than those of men doing the same work but employed by other industries, where wages are regulated by the supply and demand for labor."

Coal Production Increased to 4,250,000 Tons

WASHINGTON, Aug. 8.—An increase of about 7½ per cent in the production of bituminous coal for the week of July 31 to Aug. 5, inclusive, is indicated by the weekly report of the United States Geological Survey. This was the eighteenth week of the coal strike.

Preliminary returns show a production for the week of 4,250,000 tons against 3,933,000 tons in the week before. The increase is due, the report states, to improved car supply in the Middle Appalachian fields rather than to reopening of mines hitherto closed by the strike.

In spite of the increase in bituminous output, the eighteenth week finds production still about 1,100,000 tons short of the level reached before the railroad shopmen's strike, for in the week ended June 24, 5,337,000 tons of coal were raised.

Production of anthracite in the week ended Aug. 5 will be barely 30,000 tons. The total of all coal, anthracite and bituminous, is therefore in round numbers 4,280,000 tons. In the corresponding week of 1921 7,320,000 tons of bituminous and 1,750,000 tons of anthracite were produced, making a total of 9,070,000 tons; and the rate the year before that was 11,283,000 tons. The

present rate of output is therefore from five to six million tons below normal.

Beehive Coke Production

There was but little change in the production of beehive coke during the last week of July. From reports of cars loaded by the principal carriers, it is estimated by the Geological Survey that the total output was 110,000 tons, an increase over the revised figure for the week preceding of 5000 tons.

Cumulative production for 1922 now stands at 3,625,000 net tons against 3,563,000 tons during the corresponding period in 1921, and 12,411,000 tons in 1920.

Revision of Coal Priority List

The Interstate Commerce Commission on Aug. 4 issued amendment No. 1 to its car service order No. 23. This amendment places in class 2 of the priority list all bituminous coal which has passed over screens of 4 in. or larger opening, coke and anthracite coal, to be shipped to retail dealers for household use. Class 4 is eliminated and a new class 4 is substituted therefor, reading as follows:

Class 4. Coal for the production and manufacture of foodstuffs and medicines and for the manufacture of containers therefor, for daily use but not for storage, exchange or sale.

This places tin plate mills, for example, within the class 4 priority, but it is doubtful whether there will be any coal for those in class 4 until production has been considerably increased.

Agents of the Interstate Commerce Commission to have charge of car service directions have been stationed at the following points: Thurmond, W. Va., S. J. Maywood; Bluefield, W. Va., B. S. Robertson; Huntington, W. Va., C. C. Semple; Norton, Va., W. L. Barry; Knoxville, Tenn., O. S. Reynolds; Louisville, Ky., H. M. Priest; Birmingham, Ala., J. B. Ford.

Ask Repeal of Illinois Miner Law

The Illinois Manufacturers Association and other commercial bodies are sending appeals to members of the Illinois State Legislature, asking them to call a special session in order to pass laws and repeal laws which at present bar any except experienced miners from working in Illinois coal mines. Workers now must have had two years experience to pass the examining board and it is charged that it is seen by the board that only union miners pass. It is urged that the law be annulled in view of a possible national emergency, which could not be advantageously met under the existing statutes.

Industry Retarded by Strikes

Advance information furnished by the Department of Commerce in connection with its Survey of Current Business supports previous conclusions regarding the retarding effect of labor difficulties on industry. So far, these disturbances do not seem to have affected the deeper undercurrent of returning prosperity. Production in many industries has been slowed down by these annoyances, but there is a general feeling that early settlements will be reached and that business will continue to gain in volume.

Freight Car Situation

WASHINGTON, Aug. 8.—The effect of the strike of railroad shop mechanics on the rolling stock of the railroads is noted in the latest report of the car service division of the American Railway Association. Although this report covers conditions only up to July 15, two weeks after the rail strike was called, there was an increase of 17,496 bad order cars during that period. Of the 2,258,267 freight cars on line 342,079, or 15.1 per cent, were in need of repairs on July 15, compared with 324,583, or 14.3 per cent on July 1.

Freight cars idle on American railroads on July 15 totaled 417,029, compared with 405,120 on July 1, or an increase of 11,909 cars. Allowing 7 per cent as representing the normal number unfit for service would leave 184,000 as the number unfit for service and idle because of business conditions.

Pittsburgh Not Looking for Early End of Strikes

PITTSBURGH, Aug. 8.—Iron and steel and fuel interests here still hesitate about believing that there will be an early termination of the railroad and coal miners' strikes. So far as the coal strike is concerned, all signs now point to a finish fight, and it may be set down positively that the representation of Pittsburgh coal operators at the national conference scheduled to be held in Cleveland to-morrow will be no greater than at the attempted meeting in that city yesterday. Reports reaching here from Cleveland are to the effect that so little tonnage was represented at the meeting called by President John L. Lewis of the coal miners' union yesterday that it was adjourned almost as soon as it was called.

Considerable embarrassment has been caused the Pittsburgh coal operators by a meeting held here Sunday between A. M. Ogle, president National Coal Association, and Mr. Lewis, accompanied by attorneys. The result was the drawing up of a memorandum of agreement, the outgrowth of which is the idea of to-morrow's conference in Cleveland. To this it is hoped to attract operators from all over the country. Mr. Ogle, according to local coal operators having membership in the National Coal Association, has no authority as head of that organization to negotiate wage scales or other matters in the present dispute. His action, as well as other matters in connection with the strike situation, are believed to have been threshed out at a meeting held here to-day of the Pittsburgh coal producers' association.

Meanwhile, the coal situation in this part of the country as far as production is concerned does not change much. There has been no material falling off in the output of the mines, but the impression is so strong in the minds of striking miners that victory is at hand that efforts to reopen idle mines have not met with much success. Priorities in the distribution of coal thus far have not been very generally applied, chiefly because the machinery for enforcing them has not yet been set up. The result is that coal prices are largely on a supply and demand basis and no attention has been given the maximum suggested from Washington.

Steam coal from nearby fields to-day is selling at $7.50 per net ton at mines, while by-product grade commands $7.50 and lump gas coal is selling around $8. The railroads seem to be making some progress in replacing striking shopmen, but operations still are more or less adversely affected by the poor condition of the equipment and of course by the inability of the railroads to secure full supplies of coal.

The issue in both the coal and railroad strikes is very clearly defined. Mine operators believe that they will be successful in the struggle if given sufficient time and the same thought is uppermost in the minds of the railroad executives. Whether the struggles will be allowed to go to a definite conclusion seems to hinge largely on the attitude of the Government. Business men generally hope that the Government will not interfere because they believe that at best only a partial settlement could be effected.

Strike at Chicago Rail Steel Mills

CHICAGO, Aug. 8.—Approximately 1000 mill hands have struck at the hard steel bar mills of the Inland Steel Co. and the Calumet Steel Co. at Chicago Heights, Ill. The strikers want a 20 per cent increase in wages. Both skilled and unskilled workers are out.

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ESTABLISHED 1855

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Repeal the Immigration Act

In the matter of immigration our "open door" policy allowed us for many years to draw upon the manual labor of Europe's best types. But the quality of our immigration gradually deteriorated, as more backward peoples sought an asylum here, and a change in our "open door" law was called for but was not obtained. When the cumulative effect of our mixed immigration policy could no longer be ignored, not a few insisted upon a "closed door" policy; but these had no knowledge of our industrial dependency, and a temporary compromise was attempted in the 3 per cent Dillingham Law, the damaging effects of which are now clearly apparent.

Unfortunately the framers of this law took no account of the inferior industrial and mental quality of our more recent immigration. The result was—to the gratification of organized labor—that we deprived ourselves of needed additions to both our skilled and common labor. Under the law, the large body of non-industrial aliens in our midst has been unnecessarily increased. And now a two-year extension of the Dillingham law has been made without sufficient inquiry as to its results, and largely under pressure from those interested in creating a monopoly of jobs.

Taking the countries which supply nearly all the common labor used in the industries outside the needle trades, we gained in immigration over emigration in the ten months ending April 30, 1922, the almost negligible figure of 9813 adult persons of the class usually able to enter industry. But this is not the whole measure of damage done to our industries, which were regularly requiring and absorbing a quarter of a million adults annually, qualified for common labor. We actually lost some tens of thousands of good workers during these ten months, 25,000 in fact, and in addition 46,394 Hebrews entered under the Dillingham law in that time, while only 713 of the Jewish emigrant class left the United States. These Hebrews included women and children "of no occupation," who composed the majority and who quickly migrated to the already congested ghettos of a few larger cities, while the adult males who entered with them were largely of the needle trades in which we already had an oversupply. This class of immigrants has refused, as a rule, to enter into other industries. The Dillingham law, therefore, places a continued penalty upon our former lack of discretion and upon our immigration policy based largely on sentimentality.

The maintenance of our common labor is basic and is an industrial necessity. There is, in fact, already a deficit in the common labor supply in various parts of the country which causes a real "restraint of trade" and of new enterprise. Many types of manual labor are needed in our agricultural and industrial territories and additions also to the body of our skilled craftsmen. The supply of this labor through immigration has been deliberately allowed to run down with the active aid of those interested in insuring that labor here shall have a high scarcity value.

Thus recruiting for the low manual jobs in the United States, which the average American worker for years has resolutely refused to perform is now left to politics and a freak law. The common labor which will fire the factory boiler, reap our harvests and "help" building tradesmen and skilled craftsmen in every line is absolutely necessary to normal operations. For many years it has been almost wholly supplied by immigration and is now at a minimum.

The immigration restrictions needed are these: An immediate repeal of the Dillingham 3 per cent law, the improvement of our general immigration code which at present makes it absolutely impossible to discriminate at any time in favor of the real labor needs of the country, and some emergency control of admission to the country which shall be legally operative whenever it is needed to mitigate the social effects of the trade depression or to prevent an immigrant "run" upon the United States during a crisis.

Commissioner W. W. Husband of the Federal Immigration Bureau declared last week at the Wellesley Industrial Conference that our policies of "open door," "closed door" and "percentage basis" were fundamentally wrong and insisted that when the United States is short of one kind of labor we should have laws which will permit us to handle the matter scientifically, laws which will allow us to pick and choose intelligently and

to obtain material that would surely develop into good American citizenship. The modification of the law should follow the example of Canada which has saved herself the dilemma in which we find ourselves by exercising a selection privilege at the place of origin. Canada ascertains the qualification for making good and certifies to it abroad, before issuing an embarkation permit, and does not leave it to chance and discovery after the entrant has been turned loose upon the country. Such a revision of our policy is not opposed to the traditional "spirit of America," but is calculated to make the lot of all those accepted and of their families more satisfactory than ever before.

Our population, foreign-born or with one or both parents of foreign birth, was 36,398,958 persons out of a total population of 105,710,620 at the census of 1920. That is, one-third of our people were of foreign origin. In view of this it is obvious that definite steps must be taken to insure the raising of the quality of our immigration, the continuation of which on the present basis of quality and quantity would lead to great impoverishment of the national intelligence and resources and corresponding damage to industry.

Coal Stocks and Coal Strikes

From one viewpoint it appears to be fortunate that the iron and steel industry has adopted the by-product coking process so extensively in recent years, for in this coal strike the stocks of coal at by-product ovens have helped greatly in maintaining the industry in operation. Were there no by-product industry, it might be argued, the iron and steel industry would have been affected much more seriously by the strike.

From a long range viewpoint there does not seem to be much in the argument. For decades we have had recurrent coal strikes and the whole thing seems to have developed long ago into a guessing contest. The coal consumers try to guess how long the strike will last, and lay in stocks accordingly, while the coal miners try to guess how long the stocks will last and make their preparation in corresponding manner. Each long strike added to the history of the industry induces both parties to make guesses of longer periods for the next strike.

At this time, when the coal strike has lasted for four months, it may well be asked whether the practice of stocking coal is doing any practical good. The consumer bears the expense of stocking. He pays in most cases an extra price for some coal during the strike. Afterwards he is likely to pay an extra price for coal by way of reimbursement to the coal miner for the time the miner has lost.

It has been urged repeatedly that coal consumers should stock coal in summer so as to take the peak off the load of the mines and the railroads in winter. Consumers have been indisposed to do this to any extent, presumably on account of the expense, and also because of a feeling that the risk of being without coal or of having to pay an extra price for a time is simply of the same order as other risks that business and industry must take.

If there is such objection to stocking coal against winter, which is sure to come year after year, it may well be concluded that the stocking of coal against coal strikes is a serious burden upon industry. While that is a serious burden the other burdens involved in a coal strike are greater still. The practice of having a strike at the time of every wage scale settlement, or a "suspension" as the operation used to be termed, is so fixed that it will certainly require very definite and positive action to eliminate it.

In proportion to the value of coal, the cost of stocking is very considerable. While for years it has been preached that consumers should stock coal it may well be considered whether, after all, it would not be cheaper and more efficient to devise means whereby coal can be produced and moved just as it is required. We have become so accustomed to waste and inefficiency in the production and distribution of coal that the whole question needs to be considered afresh without bias from habits of thought already formed.

High-Test Iron Castings

Whether iron castings containing steel scrap are called "semi-steel" or "high-test iron" they have become recognized as a distinct product. Official sanction for the use of the term high-test iron was given by the American Society for Testing Materials at its annual convention in June when tentative specifications were adopted for cupola castings under this designation.

Opinions are divided as to the percentage of steel scrap that will produce the best results. It has been assumed too readily that almost any quantity up to 40 or 50 per cent is productive of good castings. The specifications referred to say nothing about the charge to be used, but deal largely with methods of testing. On other pages of this issue is a critical discussion of the proper percentages of steel scrap in cupola iron and the effect on the strength, carbon absorption and hardness. It is based on operations in a large Middle Western foundry which throw new light on the metallurgy of this interesting product. While 40 per cent of scrap in cupola charges seems to insure the strongest iron, there are reasons why 20 to 30 per cent represents the best working charges. Again, as to hardness and carbon absorption, anything above 40 per cent scrap avails nothing and, as with the strength, a deterioration follows.

Definite scientific data on the metallurgy of high-test iron, which afford a more scientific control of the cupola, are welcome. It may be that the looseness of nomenclature that gave the current designation of semi-steel is in part responsible for the evident latitude in practice which this metal has taken in the past 20 years. With the principles controlling its production better defined and with tests prescribed as in the specification lately sanctioned it should take a place of even larger importance among high-grade products of the foundry.

Never in the history of American iron and steel exports has there been so large a movement in black steel sheets as in the past few months. We have referred before to the remarkable demand from Japan, which began to attract

attention a year ago. For the eleven months ended with May, Japan took about 83.75 per cent of the total exports of sheets, the actual figures being 516,774,613 lb. (230,703 gross tons) out of 617,143,078 lb., or over $17,500,000 worth. No other American steel product has approached this record in the same eleven months. In 1913 the foreign sales of sheets were insignificant and the present movement compares well with some of the war exports of steel for munitions. New building laws in Japan requiring the use of metal in place of the highly inflammable materials hitherto used, are the chief cause of this large demand.

Viewpoints of Old and Young

There have been various times when the views of old men and young men as to industrial and business matters differed fundamentally by reason of the difference in conditions in the periods in which the two groups received their training and formed their philosophies of affairs.

Approximately seven years have elapsed since commodity prices and wage rates began to mount as a result of war conditions. In those seven years many new workmen have come into the field and many young men have risen to positions of responsibility. The time is long enough for these graduates to constitute a considerable part of the whole body, and some of the things that older men consider curious in present-day conditions are explained by that fact.

In a valuable monograph published a year ago, "Price Changes and Business Prospects," Leonard P. Ayres, vice-president of the Cleveland Trust Co., emphasized the difference in philosophy between men who received their business training after the year 1896 and those who flourished in the preceding 30 years. From the Civil War to 1896 the general trend of prices was downward. Afterwards the general trend was upward. The early generation was trained to conservatism and learned the evil of issuing bonds. The later generation was trained in optimism and learned how profits could easily be made by issuing bonds. In 1896 there were "bloated bondholders." Later, the bondholder became a victim of the high cost of living.

In 1916 boys in their teens were given jobs at wages double what their fathers had been able to earn at double the age. Now they are men six years older and seriously believe high wages for performing relatively simple operations are perfectly natural and must be striven for. The beginners of 1917 are five years older. Altogether the respective classes count up. These young men do not know what hard work is, and as to striving, the chief idea in many cases is a strike. If older men endeavor to point out that the viewpoint is wrong, that these striplings cannot reasonably expect to thrive so easily, the counsel is treated with indifference or contempt. The elders are "old fogies" and have not kept up with the times.

At various times since the armistice it has been said in substance that the will to work, to work efficiently and industriously and for reasonable wages, would not be restored until industry had passed through a depression. In the past few months the remark has been that the depression of 1921 has not produced the expected results, and it has been asked whether the trouble is that it was not long enough or was not deep enough. When one divides the workers into the two classes—on the one hand those who knew the ups and downs of business before the great war and appreciate that there must be hard work in order to succeed at all, and on the other hand those whose whole experience has been accumulated in the past seven years, he will have strong suspicions that the older men need no additional experience, but that the younger men have had no real experience at all. To them 1921 may appear simply as a curious vacation period, an unexplained interruption that merely needs to be forgotten.

That American vessels are fast falling behind in the struggle for ocean supremacy is becoming increasingly apparent from reports, month by month, of the Department of Commerce. For the eleven months ended with May foreign vessels brought in 68 per cent of our imports, while American vessels accounted for only 32 per cent. This compares with 41 per cent in American vessels for the eleven months ended with May, 1921, and 59 per cent for foreign vessels. While the present share of American carriers in American commerce is a great improvement over pre-war years, the figures do not show the 50 per cent participation which might be considered normal. It is interesting to note that about 100 years ago American vessels carried as much as 90 per cent of the total, and in 1910, the low record year, less than 10 per cent.

Probably for the first time on record France is producing more pig iron than Great Britain. It would at least be necessary to search the records of normal production during many years to find a parallel, if one exists. In May France produced 435,300 gross tons of pig iron against Great Britain's 407,900 tons, and that was the third month this year in which the balance was in favor of France. In the first five months of this year the French production averaged 362,400 tons, while the British average was only 356,000 tons per month. In 1913 and in 1920 the British output was more than double that of France. A British authority states that export business with Germany and activity in the building trades are the main reasons for the improvement in the French industry. Before the war Great Britain led the world as an exporter of pig iron, but thus far this year the movement has been less than half what it was in 1913.

Iron Age Index

The index of THE IRON AGE for the past half year, January to June inclusive, has been compiled and printed and is now ready for distribution. It will be forwarded promptly to those who have entered their names on our list as desiring it. Others who may have use for copies will be furnished them by addressing our Circulation Department.

MAHONING VALLEY CONDITIONS

Curtailment of Operations—Pig Iron, Semi-Finished and Finished Steel Markets

YOUNGSTOWN, OHIO, Aug. 8.—In the Youngstown district, the Youngstown Sheet & Tube Co. has suspended a second blast furnace in its East Youngstown group, its Bessemer department, one blooming mill and two open hearth furnaces. At its Farrell, Pa., plant, the Carnegie Steel Co. has banked Nos. 1 and 3 blast furnaces and has suspended its steel department, consisting of 12 open hearth furnaces, blooming and bar mills. The Republic Iron & Steel Co. has cut the number of its active open hearth furnaces to eight and but one skelp mill at its Brown-Bonnell plant is rolling.

Active blast furnaces in the Mahoning Valley have been reduced to 10, as follows: Carnegie Steel, five of six at its Ohio Works; Youngstown Sheet & Tube Co., two of four at East Youngstown, and Republic Iron & Steel Co., Sharon Steel Hoop Co., and Brier Hill Steel Co., one each. On July 1, when the railway shopmen's strike started, 18 furnaces were active in the Valley.

Independent steel making has been reduced to 36 of 51 open hearth furnaces. Sheet mill production is being sustained, however, as 106 sheet mills were scheduled at the beginning of the week. Non-integrated sheet rollers say their sheet bar supplies are sufficient for maintenance of rolling at a normal rate until September.

The Sheet & Tube company is operating but one of six batteries of by-product coke ovens, the output being sufficient for one blast furnace. It is planned to suspend a second stack as soon as coke stocks are exhausted and conserve coal for finishing mill uses. The company has sufficient semi-finished steel on hand to maintain rolling mill operations through August.

Production Cost of Steel Up $15 a Ton

Coal is not now available for the industry, states President James A. Campbell, adding that it would be impossible to pay prevailing prices without advancing prices of steel products. In the production costs of the higher finished steel products, advanced fuel costs add at least $15 per ton, he states. There has been of course no proportionate advance in steel prices. Higher prices in general for steel products are predicted by Mr. Campbell when the industry again reaches normal. Continued scarcity of coal, following adjustment of current labor disputes, is predicted for the industry, tending to keep prices up and adding to production costs of iron and steel.

Whereas the Sheet & Tube company consumes under normal operations an average of 135 cars daily, its receipts dropped to 11 cars one day last week and 35 another. Much of the coal coming into this territory is of indifferent quality.

Market for Finished Steel

Automobile interests continue to press for delivery of sheets, especially on full finished sheets and strip steel. There is little surplus fine finished sheet stock available in this district, as the chief maker is fully engaged on orders from regular trade channels. It is pushing the installation of six additional mills at its Newton Falls plant.

Bars, plates and shapes are moving toward a 2c. minimum. The chief independent merchant bar interest is out of the market and is falling behind in its obligations to customers, due to interruptions to production. In this territory, strip steel is quotable at 2.60c. to 2.75c. for hot-rolled, while cold finishes are being quoted at 4.25c., an advance of $5 per ton over recent levels.

In the pipe market, demand exceeds ability of makers to produce under present conditions, and is exceptionally marked for buttweld sizes. Difficulties in production due to coal shortage are assuming serious proportions, and it is unlikely the present rate of operations can be long maintained.

The leading independent producer of wire products again curtailed output this week and is out of the market, in so far as new commitments are concerned. Though nominally quoting nails at $2.50 per base keg, such business has been accepted for some time at $2.40. Prices of nails and of plain wire at $2.25 are declared prohibitively low by this interest.

Brier Hill Steel Co. continues to quote from 2c. to 2.40c. for plates, but is accepting only 84-in. mill sizes. A district fabricating interest is figuring on plate work for a power house installation in Massachusetts requiring 2200 tons of plates for fabrication into smokestacks, boilers and the like. An independent has been negotiating for resale of 90,000 lb. of small squares of forging steel quality, now in a warehouse in Massachusetts.

District interests do not expect priority regulations of the Interstate Commerce Commission to affect coal already loaded and consigned to them, prior to issuance of the order.

Virtually no pig iron is being offered for sale in the Mahoning Valley, due to cutting down of the number of active furnaces and prevention of operation by merchant stacks which had planned to start. One interest whose operations may permit small surpluses to be sold says it will adhere to a $27 minimum for standard basic iron. Another independent is using a considerable tonnage of off-grade basic, which has been lying in its yards for several years, to meet the current emergency.

All grades of semi-finished steel are held at $35, with little merchant tonnages available except to regular customers. In current rollings, production of sheet bars is considerably ahead of slabs or billets. Already there has been a curtailment in supplies going to non-integrated rolling interests, and sheet production will sooner or later be adversely affected as these supplies are diminished.

The Girard plant of the A. M. Byers Co., Pittsburgh, producers of wrought iron pipe, opened Monday with 30 puddling furnaces fired, of 88, and one skelp mill rolling, but planned to suspend entirely before the week-end. Two light bar mills, which were active last week at the Brown-Bonnell works of the Republic Iron & Steel Co., are idle this week.

Improved Car Movements

During the first five days of August the average daily loaded car movement in the Youngstown district was 15 per cent greater than during corresponding period in July, and 20 per cent ahead of the same period in August, 1921. Considerable improvement has been effected in freight movement of the Baltimore & Ohio Railroad, which was the worst hit of any of the carriers serving this territory.

July wage distribution through banks was $4,226,-181, a decline of $461,795 from the preceding month. July is the first month of the year to fail to show a gain over its predecessor. The decline is attributed to loss of employment resulting from the coal and rail strikes. The July disbursement, however, compares with a payroll of $3,323,982 in July, 1921, the low point in the post-war depression.

Higher labor costs are predicted by some interests. During the summer, until the shopmen's strike precipitated intermittency of employment, labor shortage was felt by most plants, especially at sheet mills. Workers have been attracted from the steel industry to other forms of employment.

The International Harvester Co., Chicago, has let a contract for a one-story open hearth works for the Wisconsin Steel Co., One Hundred and Sixth Street and Torrence Avenue, to cost $360,000. The building will be 143 x 504 ft. The company has also awarded a contract for a one-story storage building for steel, 103 x 400 ft., to cost $80,000.

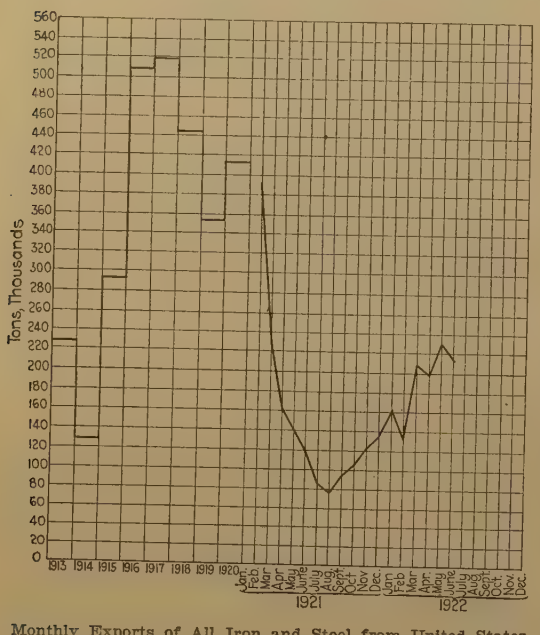
David Evans & Co., 3720 South Kedzie Avenue, Chicago, has opened a scrap iron and steel department in charge of Charles J. Reagan, formerly with Briggs & Turivas. David Evans & Co. has been in the pig iron, coke and ferroalloy business for 22 years and is well known in the iron and steel trade.

Iron and Steel Exports Fall Again

Drop 8 Per Cent Below May, But June Shows Larger Than Any Other Month Since March, 1921—Fiscal Year Less Than Half the Previous Year

WASHINGTON, Aug. 8.—Reflecting a substantial decline, iron and steel exports for June aggregated 212,295 gross tons, valued at $18,649,816 as compared with 230,062 tons valued at $29,456,348 in May. For the fiscal year 1922 ended with June, exports totaled 1,721,418 tons valued at $181,798,042 as compared with 4,168,619 tons valued at $608,541,550 for the fiscal year ended with June, 1921.

Exports of machinery, exclusive of vehicles, for June, were valued at $23,554,356, as compared with $19,415,994 for May. For the fiscal year ending with June they were valued at $245,946,681. For June of last year machinery exports were valued at $31,860,156 and for the fiscal year ending with June, 1921, at $593,042,511.



Monthly Exports of All Iron and Steel from United States. The horizontal lines at left show, in each case, the average month of the year indicated. The curve at right shows the movement during the past 18 months

In contrast to the downward trend of iron and steel exports in June, there was a sharp increase of imports, which totaled 39,155 tons, valued at $3,717,093, comparing with 23,093 tons valued at $2,966,332 for May. The chief increases in manufactured imports were made in ferromanganese, which amounted to 13,535 tons in June, and in scrap, which amounted to 10,000 tons. For the fiscal year ended with June, 1922, iron and steel imports totaled 186,186 tons, valued at $29,660,540. For the fiscal year ended with June, 1921, imports totaled 244,164 tons, valued at $44,236,077. Imports of manganese ore in June totaled 44,329 tons, valued at $310,529, as compared with 46,517 tons in May, valued at $307,571. For the fiscal year ending in June, 1922, manganese ore imports totaled 257,208 tons. For the corresponding period of last year they amounted to 682,770 tons.

Of the total June imports practically all, as is shown by an accompanying table, came from the United Kingdom and Canada, the former shipping 18,882 tons and the latter 14,481 tons to the United States. Im-

Exports of Principal Steel Products for June, 1922, by Countries

	Gross Tons	Per Cent of Total
Black Steel Sheets:		
Japan	18,071	75.9
Canada	3,453	...
Argentina	761	...
Tin Plate:		
British India	3,393	41.6
Japan	1,949	...
Canada	1,012	...
Steel Rails:		
Japan	26,114	59.8
Canada	5,112	...
Mexico	4,797	...
Galvanized Wire:		
Japan	3,225	...
Argentina	2,212	...
Canada	1,254	...
Philippine Islands	1,223	...
Barbed Wire:		
Argentina	2,923	...
Brazil	1,524	...

Exports, January, 1920, to May, 1922, inclusive

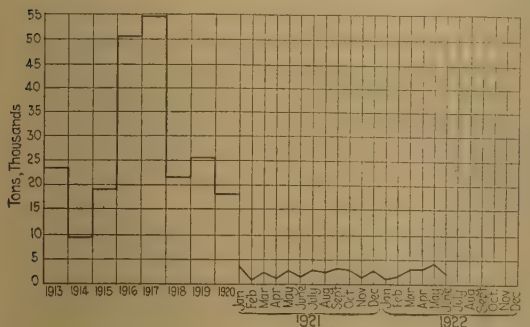
	Gross Tons		
	All Iron and Steel	Pig Iron	Semi-finished Material
Calendar year 1919	4,239,837	309,682	258,907
January, 1920	333,601	18,468	19,937
February	308,185	15,739	22,693
March	417,216	22,740	30,444
April	395,120	14,608	19,032
May	420,359	13,032	16,370
June	402,707	17,075	29,811
Fiscal year 1920	4,212,732	248,126	288,766
July	458,866	29,647	17,243
August	431,434	22,645	20,920
September	409,200	22,724	18,113
October	452,015	17,296	11,353
November	434,297	13,929	7,042
December	498,765	10,055	3,415
Calendar year 1920	4,961,851	217,958	216,873
January, 1921	547,394	3,710	315
February	393,328	1,307	92
March	230,635	2,320	1,023
April	162,592	1,234	678
May	142,551	2,541	749
June	119,081	1,689	1,106
Fiscal year 1921	4,168,619	129,541	82,549
July	86,523	2,744	363
August	75,827	2,424	2,447
September	95,169	3,078	1,318
October	106,582	2,830	153
November	122,290	1,299	1,869
December	134,415	2,550	250
Calendar year 1921	2,213,042	28,305	10,363
January, 1922	160,920	1,043	4,683
February	133,975	1,430	6,627
March	208,843	2,724	10,002
April	198,830	2,750	9,376
May	230,062	3,897	13,091
June	212,295	1,996	13,178
Fiscal year 1922	1,721,418	28,330	63,127

Imports of Iron and Steel—Gross Tons

	June		Year End'g June	
	1921	1922	1921	1922
Ferromanganese	265	13,535	43,197	30,799
Ferrosilicon	520	1,518	7,361	11,011
Pig iron	3,688	5,850	51,757	40,472
Scrap	1,372	10,000	82,657	50,969
Steel bars	116	914	4,293	5,399
Bar iron	33	268	3,815	2,919
Structural steel	72	154	1,394	1,525
Billets, without alloys	245	47	995	11,010
All other billets	51	128	3,216	1,069
Steel rails	2,585	6,586	37,583	29,105
Sheets and plates	48	29	2,781	334
Tin and terne plates	26	64	503	356
Wire rods	24	62	4,612	1,218
Total	9,045	39,155	244,164	186,186
Manganese ore and oxide	17,169	44,329	682,770	257,208

ports from Belgium totaled 3750 tons and from Germany 934 tons.

Examination of the June exports shows that the decline was applied to practically all of the important steel products. It was particularly noticeable in the case of black steel sheets, exports of which for May



Monthly Exports of Pig Iron from United States. The horizontal lines at left show average month for each year. The curve at right shows the movement during 1921 and 1922

totaled 34,619 tons as compared with only 10,296 tons in June. In this connection it is interesting to observe that, while Japan continues to be the largest single buyer of American iron and steel, shipments to that country showed a decided drop in June as compared with May. Of the exports of 43,672 tons of steel rails, the greatest export item, Japan took 26,114 tons. Of the total of 23,822 tons of black steel sheets, the next to largest item of exports in June, Japan took 18,071 tons.

MACHINERY EXPORTS
By Value

	June, 1921	June, 1922	Twelve Months Ending June, 1921	Twelve Months Ending June, 1922
Locomotives	$4,254,474	$783,170	$46,567,683	$18,133,022
Other Steam Engines	.....	298,401	.....	*1,361,900
Boilers	209,263	154,358	8,893,878	1,506,133
Accessories and Parts	.....	53,982	.....	*536,018
Automobile Engines	125,992	831,401	2,662,803	3,955,569
Other Internal Combustion Engines	595,775	510,228	10,435,325	3,266,931
Accessories and Parts for	.....	225,567	.....	*1,342,338
All Other Parts of Engines	713,807	.....	20,363,872	†3,251,595
Complete Tractors, except Agricultural	119,124	9,674	19,792,732	266,954
Electric Locomotives	252,771	.....	825,753	†1,339,190
Other Electric Machinery and Apparatus	2,266,675	751,356	36,273,139	15,527,171
Excavating Machinery	124,573	.....	2,756,581	†710,339
Concrete Mixers	41,102	32,243	1,024,026	398,234
Road Making Machinery	81,447	.....	1,182,183	†414,539
Elevators and Elevator Machinery	189,578	.....	2,124,397	†552,821
Mining and Quarrying Machinery	1,704,881	568,726	21,620,815	5,358,265
Oil Well Machinery	.....	580,837	.....	*2,273,191
Pumps	827,624	.....	16,804,050	.....
Lathes	131,140	84,198	5,375,690	1,045,209
Boring and Drilling Machines	.....	68,580	.....	*355,028
Planers, Shapers and Slotters	.....	52,280	.....	*148,021
Bending and Power Presses	.....	31,531	.....	*239,323
Gear Cutters	.....	15,937	.....	*37,303
Milling Machines	.....	51,622	.....	*158,645
Sawing Machines	.....	6,678	.....	*27,268
Thread Cutting and Screw Machines	.....	17,290	.....	*86,835
Punching and Shearing Machines	.....	20,685	.....	*96,569
Power Hammers	.....	3,162	.....	*55,798
Rolling Machines	.....	585	.....	*24,504
Wire-drawing Machines	.....	3,152	.....	*7,226
Polishing and Burnishing Machines	.....	894	.....	*9,688
Sharpening and Grinding Machines	60,499	69,297	2,576,498	832,708
Other Metal Working Machinery and Parts of	1,296,574	813,229	26,488,232	6,952,320
Textile Machinery	1,045,095	1,385,904	23,513,228	17,469,311
Sewing Machines	483,820	.....	11,280,128	5,727,922
Shoe Machinery	110,675	81,981	2,802,105	997,475
Flour-Mill and Gristmill Machinery	58,192	80,659	2,238,374	1,036,997
Sugar-Mill Machinery	1,596,972	494,532	29,108,909	4,392,269
Paper- and Pulp-Mill Machinery	108,908	.....	3,562,585	†1,376,074
Sawmill Machinery	54,941	23,418	1,392,454	570,287
Other Woodworking Machinery	110,653	109,570	3,835,711	1,092,783
Refrigerating and Ice Making Machinery	102,631	166,123	3,390,763	1,866,823
Air Compressors	292,807	248,558	5,675,504	1,995,381
Typewriters	723,797	1,012,065	18,867,513	10,395,623
Power Laundry Machinery	56,477	41,899	1,139,309	551,717
Typesetting Machines	166,136	369,560	4,536,013	3,415,798
Printing Presses	375,004	227,293	10,383,632	4,694,510
Agricultural Machinery and Implements	3,262,641	1,821,264	51,344,292	19,055,581
All Other Machinery and Parts	10,316,108	11,455,170	194,203,834	101,056,573
Total	$31,860,156	$23,554,356	$593,042,511	$245,946,681

*—January 1, 1922, to June 30, 1922.
†—July 1 to December 31, 1921.

Exports of Iron and Steel—Gross Tons

	June 1921	June 1922	Twelve Months Ending June 1921	Twelve Months Ending June 1922
Pig iron	1,637	1,996	125,629	28,530
Ferromanganese	....	55	3,335	1,021
Ferrosilicon	52	58	511	463
Scrap	3,587	8,739	182,478	60,875
Ingots, blooms, billets, sheet bar, skelp	1,106	13,178	82,549	63,127
Iron and steel bars	8,335	19,084	507,747	102,190
Alloy steel bars*	....	229	.....	4,673
Wire rods	492	3,565	61,567	41,123
Plates, iron and steel	7,781	9,844	761,022	119,851
Sheets, galvanized	2,942	10,628	93,155	32,172
Sheets, black steel	10,296	23,823	155,841	299,328
Sheets, black iron	948	721	22,722	6,639
Hoops, bands, strip steel	1,302	3,032	38,405	25,033
Tin plate, terne plate, etc.	2,727	8,160	178,299	78,551
Structural shapes, plain material	18,058	6,023	526,482	113,224
Structural material fabricated	1,951	2,380	32,089	23,281
Steel rails	20,308	43,672	549,558	240,162
Rail fastenings, switches, frogs, etc.	699	5,378	14,219	23,962
Boiler tubes, welded pipe and fittings	26,074	18,718	444,705	161,857
Cast iron pipe and fittings	4,076	1,686	54,183	26,377
Plain wire	2,569	11,283	167,898	83,840
Barbed wire and woven wire fencing	1,757	8,825	86,936	42,363
Wire cloth and screening*	....	170	.....	‡622
Wire rope and cable*	.....	333	.....	‡2,312
Wire nails	951	4,675	67,017	51,286
All other nails and tacks	226	913	13,088	7,126
Horseshoes	32	50	1,505	703
Bolts, nuts, rivets and washers, except track	1,175	1,868	37,613	14,620
Car wheels and axles†	....	1,986	.....	‡8,178
Iron castings†	....	729	.....	‡5,233
Steel castings†	....	97	.....	‡1,249
Forgings†	....	387	.....	‡1,262
Machine screws†	....	10	.....	‡85
Total	119,081	212,295	4,168,619	1,721,418

*Not reported separately, prior to January, 1922.
†Previous to January, 1922, reported by value only.
‡Six months, only.

Sources of June, 1922, Imports of Iron and Steel

Countries	Tons
United Kingdom	18,882
Canada	14,481
Belgium	3,750
Germany	934
Sweden	831
Italy	104
Virgin Islands of U. S.	75
France	72
Austria	23
Norway	2
Czechoslovakia	1
Total	39,155

Will Hold Exhibition of Machine Tools

A second annual exhibition of machine tools and appliances will be held under the joint auspices of the New Haven branch of the American Society of Mechanical Engineers and the department of mechanical engineering of Yale University, in Mason Laboratory, New Haven, Sept. 21 to 23.

The original purpose of the exhibition was to bring before the manufacturers of Connecticut and engineering students of the University the latest developments in machine tool practice. This year the purpose has been broadened with a view to contribute to the stimulation of industry and the restoration of prosperity. About 150 invitations to exhibit have been issued.

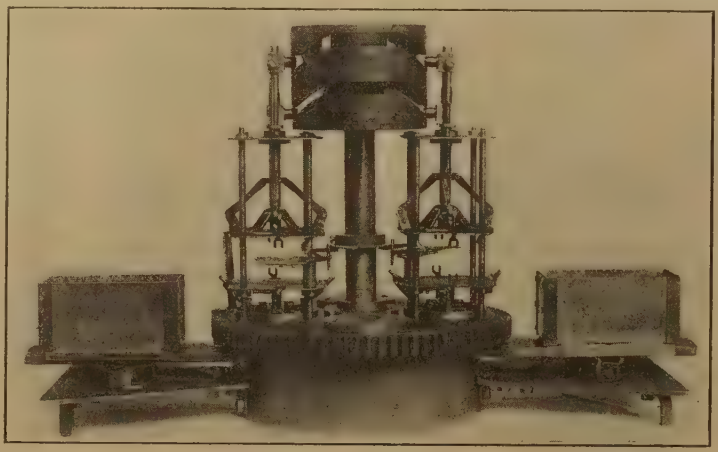
There will be no charge for exhibition space and no admission fee for spectators. Papers will be read each evening by authorities on the subjects treated; and it is expected that several exhibitors will show motion pictures of their machines, as well as having representatives present to demonstrate them. The exhibition chairman is H. R. Westcott, Westcott & Mapes, Inc., 207 Orange Street, New Haven.

DIE-CASTING MACHINE

Automatic Unit for High Production—Simultaneous Casting of Different Work a Feature

An automatic die-casting machine designed to effect a high rate of production of die-castings has been placed on the market by the W-J Die-Casting Machine Co., 24 North Wabash Avenue, Chicago.

The new machine is of the continuous rotary type, four sets of cages, arranged to carry dies of any form, being mounted on a rotating table. Two melting pots on opposite sides of the table charge the molten metal to each die as it passes the pots. In the machine illustrated two of the die cages have been removed from their places on the table to permit a better view of the mechanism and, as shown here, the melting pots are not in their cases on the slides which extend from the base of the machine. Eight castings are produced in each revolution of the table, or two in each of the four dies. At the rate of 2 r.p.m., the production would be 960 castings an hour. A feature of the machine is that different types of castings may be produced simultaneously by using different dies.



Four Sets of Cages on the Rotating Table Carry the Dies. The two melting pots are located opposite each other

As the dies approach the melting pot they are automatically closed, and the pot advanced to them. A nozzle on the pot enters a socket on the die, which is then filled with molten metal from the pot either by means of compressed air or by the action of a plunger. After the pots have been advanced to a die, they rotate with it long enough to permit sufficient metal to be forced into the die. The mechanism which actuates the melting pots provides both a rotary and in-and-out motion.

The pot then recedes, the die opens and the core pins withdraw. The casting is pushed from the upper die member by a knockout pin and falls upon a tray that is automatically brought in place to receive it. The table continues to rotate and a pair of revolving brushes loosens the dirt adhering to the dies, compressed air being then blown on the die members to remove foreign matter remaining on the die faces. On approaching the second melting pot the operations outlined are repeated.

The die is in two parts, the upper member being movable and the lower stationary. Closing the upper members on the lower, preparatory to the actual casting operation, is effected by means of the upper of the two cams shown on the post at the center of the machine. The rollers which run in the upper grooves are fastened to rods attached to the upper dies. As the dies approach a melting pot its roller runs down a decline in the groove, causing the upper die to be pushed down on the lower one. At the same time the roller in the lower groove proceeds down the decline provided for it, this roller pushing the core pins into the four sides of the upper die, this being accomplished through a sleeve and a link mechanism.

In the case of vertical core pins they are pushed straight down through the die. Adjustment is provided for varying the distance each core pin is advanced into the die. Core pins may also be introduced into the lower die member. On the table station a plate cam having four spiral grooves is mounted, each of the cams being carried on a stem projecting through the table and provided with a lever. This lever strikes a dog as the table rotates, which causes rotation of the cams. The pins which run in the cam grooves are guided at their lower ends by straight grooves. As each pair of pins slides into its groove, a link is rocked, pushing a core-pin into the lower die. There are four sets of rocking links to provide for introducing a core pin into the four sides of the die.

The dies are kept at the proper temperature by circulating water. Heating of the metal in the pots is by means of gas jets, gas flames being provided also for pre-heating the compressed air used in forcing molten metal into the dies.

In some cases a plunger and cylinder are used to force the molten metal to fill the dies completely. Under such circumstances it becomes necessary to prevent the metal from solidifying in the cylinder, this being done by heating the cylinder and plunger with a gas flame.

To meet the requirements of small shops the machine illustrated may be provided with one melting pot and two sets of dies.

Trade Commission and Steel Mergers

WASHINGTON, Aug. 8.—The Federal Trade Commission is still engaged in studying the facts and figures relating to the proposed consolidation of the Midvale Steel & Ordnance Co., Republic Iron & Steel Co. and Inland Steel Co., and no information is yet obtainable as to whether a complaint will be issued in this case. The data now being compiled in the office of the trade commission will doubtless be presented soon to the commissioners, who will then decide what further action, if any, is to be taken.

In the Bethlehem-Lackawanna case, in which a complaint was issued some time ago, no date has been set for hearings and this probably will go over until after the summer vacation period.

Mesabi Iron Co. Expansion

In connection with a recent offering in New York of 50,000 shares of common stock of the Mesabi Iron Co., it was stated that the company plans to increase materially the output of its iron ore concentrating and sintering plant on the eastern Mesabi range. The present capacity is 500 tons of sinter per day, but the coarse crushing plant, power plant and other installations are sufficient to handle a much increased tonnage. It has been estimated that on the production basis of 3500 tons of sinter per day the cost will be approximately $2.60 per ton. The Midvale Steel & Ordnance Co. has a 32 per cent interest in the company's common stock.

Molybdenum and Other Alloy Steels

In the study of molybdenum and other alloy steels, being made by Dr. H. W. Gillett at the Ithaca, N. Y., office of the Bureau of Mines, 600 endurance test pieces have been ground and polished to a special mirror finish ready for testing. These bars will keep two endurance machines busy night and day for probably more than a year.

FABRICATED STEEL BUSINESS

Bridge and Building Awards and Tonnages Pending at Leading Centers

Awards for fabricated steel work for the past week include the following:

Department store at Poughkeepsie, N. Y., 700 tons, to McClintic-Marshall Co.

Mount Holyoke College, South Hadley, Mass., 700 tons, to American Bridge Co.

Queensboro Plaza, New York, approach work, 500 tons, to American Bridge Co.

United Lead Co., Perth Amboy, N. J., 600 tons, to Levering & Garrigues Co.

Highway bridge, near Buffalo, N. Y., 575 tons to American Bridge Co.

Bridge work for New York Central Railroad, 200 tons, to Shoemaker-Satterthwaite Bridge Co., and 150 tons to Fort Pitt Bridge Works.

Bridge for Norfolk & Western, 150 tons, to Virginia Bridge & Iron Works.

Young Men's Hebrew Association, Newark, N. J., 800 tons, to American Bridge Co.

Standard Oil Co., 33 80,000-bbl. oil storage tanks for Casper, Wyo., 10,000 tons; 25 tanks to American Bridge Co. and 8 tanks to Chicago Bridge & Iron Works.

State Capitol Building, Lincoln, Neb., 2100 tons, to Omaha Steel Works.

Pullman Co., foundry building, Pullman, Ill., 1000 tons, erection to W. B. Kilgore Construction Co.; fabrication to Gage Structural Steel Co.

Power house for Indianapolis, 180 tons, to Helperington & Berner.

State bridge No. 3252 at Deer River, Minn., 119 tons, to American Bridge Co.

Bridge 1041, St. Louis County, Minn., at Hibbing, 294 tons, to American Bridge Co.

First National Bank building, Fort Wayne, Ind., 800 tons, to Whitehead & Kales.

Building for American Shipbuilding Co., 500 tons, to Republic Structural Iron Works, Cleveland.

Addition Jamestown Worsted Mills, Jamestown, N. Y., 150 tons, to Kellogg Structural Steel Co., Buffalo, N. Y.

Power house, J. N. Adam Memorial Hospital, Perrysburg, N. Y., 200 tons, to Kellogg Structural Steel Co., Buffalo.

High school, Elmira, N. Y., 100 tons, to Kellogg Structural Steel Co., Buffalo.

New Riverside pumping station, Milwaukee, 438 tons, to Worden-Allen Co.

Structural Projects Pending

Inquiries for fabricated steel work which may be added to lists of pending projects include the following:

Apartment house, Philadelphia, 1000 tons.

Highway bridge for New York, Saratoga, 600 tons.

Bridges for New York Central, 400 tons.

Addition to Chelsea Hotel, Atlantic City, N. J., 3000 tons, plans to be issued in about a week.

Bankers Reserve Life Insurance Building, Omaha, Neb., 700 tons.

Ford Motor Co. Building, River Rouge, 900 tons.

Louisiana & Arkansas Railroad, 650 tons of bridge work.

City of Seattle, bridges, 1800 tons.

Court house, Akron, Ohio, 250 tons.

Bridge for Spokane, Wash., 2000 tons, bids being taken.

Kimberly-Clark Paper Co., Niagara Falls, N. Y., 300 tons.

Spaulding & Son Paper Co., Tonawanda, N. Y., 200 tons.

Clapp Estate, Portland, Me., seven-story office building, 500 tons.

Lima Locomotive Works, Lima, Ohio, 1700 tons, general contract to James Stewart & Co.

Municipal viaduct at Atlanta, Ga., 1200 tons, bids close Aug. 23.

Office building at Charlestown, W. Va., tonnage unstated, Mills, Millspaugh & Carmichael Co., Columbus, Ohio, architects.

Buildings for new fair grounds at Huntington, W. Va., tonnage unstated, Joseph & Joseph, Louisville, Ky., architects.

Railroad Equipment Business

Locomotive purchases in July were the largest for any month this year, the total having been fully 350. The best previous month was April with about 275. The largest order was that of 150 by the New York Central, noted last week.

In freight cars, according to the *Railway Age*, July was a large month with a total of 15,675 cars, bringing the total to Aug. 1 to 103,847 cars. Passenger cars ordered in July were 120, making the total for the seven months 1352.

Inquiries for new locomotives and cars as well as repair activities continue, among which are the following:

The Baltimore & Ohio, reported as inquiring for 15 Pacific type locomotives, has ordered this equipment from the Baldwin Locomotive Works.

The Chesapeake & Ohio will receive bids until 12 o'clock noon Aug. 25 at Richmond, Va., for general repairs to 50 locomotives. This company is also asking for bids until Aug. 11 on the repair of 50 locomotives.

The Buffalo, Rochester & Pittsburgh Railroad is inquiring for 30 locomotives.

The Chicago & Northwestern has let repairs on 500 box cars to the American Car & Foundry Co.

The Fruit Growers Express is inquiring for 1000 refrigerator cars.

The Northern Pacific has ordered 1000 center constructions from the Western Steel Car & Foundry Co.

The Chesapeake & Ohio has awarded 50 refrigerator cars to the American Car & Foundry Co.

The Wilcox Co., Chicago, has awarded 50 hopper cars of 55-ton capacity to the Western Steel Car & Foundry Co.

The Indiana Gas & Coke Co. is inquiring for repairs on 50 hopper cars.

The Chicago, Burlington & Quincy is in the market for 500 to 1500 box car repairs.

The Boston & Maine is having 1000 box cars repaired at the shops of the Laconia Car Co.

The Chicago, Burlington & Quincy has ordered repairs to 500 gondolas from the Keith Railway Equipment Co.

The New York Central is having 500 coke cars converted to gondola cars at the shops of the Ryan Car Co., Hagewisch, Ill.; 500 coke cars converted into gondola cars at the shops of the Buffalo Steel Car Co., Buffalo, and 973 coke cars converted into 500 flat, 300 double deck stock and 173 single deck stock cars at the shops of the American Car & Foundry Co., Detroit, Mich.; for the Pittsburgh & Lake Erie 1200 coke cars are being converted into box cars at the shops of the Standard Steel Car Co., Newcastle, Pa.; 300 coke cars converted into box cars at the shops of the American Car & Foundry Co., Detroit.

The Rock Island has placed 1500 national dump car repairs with the Western Steel Car & Foundry Co.

The Chicago Elevated Railway has ordered 100 elevated cars from the Cincinnati Car Co.

The A. B. C. Transit Refrigerator Co., Chicago, has renewed its inquiry for 150, 40-ton express refrigerator cars.

The National Railways of Mexico have ordered 5 first-class and 10 second-class, narrow gage passenger coaches from the Pullman Co.

The Boston Elevated has ordered 40 tunnel cars from the Pullman Co.

The Baldwin Locomotive Works has received an order for 25 consolidation type locomotives from Poland. This type is a duplicate of 150 engines purchased from Baldwin about three years ago. President Vauclain stated this order will amount to about $1,000,000.

Evidence of the amazing growth of the electrical industry is afforded by the fact, shown in census reports on manufactures, that in 1919 there were 212,374 wage earners engaged in the manufacture of electrical machinery, apparatus and supplies, as compared with only 1271 in 1879. Salaries and wages increased during that period from $683,164 to $336,369,291.

The structural steel work on the new wire and rod mill of the Whitaker-Glessner plant of the Wheeling Steel Corporation at Portsmouth, Ohio, has been completed, and the brick walls are now going up. It is expected that installation of machinery will commence in about three weeks, and that operations will begin in the new mills about Jan. 1.

A booklet entitled, "250 Lacquer Questions Answered" has been issued by the Zeller Lacquer Mfg. Co., 342 Madison Avenue, New York, for distribution to those who request it. The attempt in compiling the questions and answers is to cover every problem confronting the lacquer user.

Iron and Steel Markets

MORE PLANTS SHUT DOWN

Fuel Situation More Critical in All Districts

Constriction of Steel Production Will Increase Even with Strike Settlement

The fuel stringency has become much more pronounced at iron and steel works. In the Chicago, Cleveland, Youngstown, Pittsburgh and Buffalo districts a dozen more blast furnaces have been forced to suspend. As many more are likely to be thrown idle by another week, and indications are that in two weeks several steel plants will be forced to stop.

The whole industry is in uncertainty over the working out of priorities, since the practical application of the plan has not been made known, but it is plainly indicated that for a good many weeks but a small percentage of newly mined coal will go into the production of iron and steel.

Whatever agreement may be reached at the Cleveland coal conference, Pittsburgh district mines on which the Central Western producers of steel draw so heavily will be but little affected, and Pittsburgh sentiment as to iron and steel output in the next two months is far from hopeful.

Chicago steel companies have led for many weeks in percentage of active capacity, but the operating situation there is now approaching a crisis. Shortage of open-top cars and congestion and embargoes on the railroads have been serious complications. Yet for a leading Chicago mill the week has been one of the largest of the year in new orders booked.

There is no excitement among consumers, and little of the scramble for material that is often seen in time of scarcity. Railroads, car builders and automobile works have been the most active buyers, much of the business being placed despite the fact that definite delivery cannot be promised.

Coming eastward from Chicago less pressure upon the mills appears, and in eastern Pennsylvania new inquiry is small, consumers being not disposed to pay present high prices when there is no assurance of coal with which to operate. More is heard of curtailed output by steel users because of shortage of various other raw materials and in some cases labor scarcity.

In the Pittsburgh district the Carnegie Steel Co. has been meeting the situation by concentrating in its Monongahela River plants and slowing down at outlying plants which it is more difficult to supply with fuel. The closing of the Farrell, Pa., steel works means a reduction in the allotment of sheet bars to nearby mills of the American Sheet & Tin Plate Co.

Some steel companies are increasing their scrap charge in making steel, while using up pig iron in stock and doing more melting with natural gas and fuel oil.

July output of steel ingots showed an expected decrease from June, but it was not large. The estimated daily rate for the country was 113,700 tons, as compared with 115,800 tons in June and 114,700 tons in May. The July rate represented about 35,350,000 tons per year; that of June about 36,000,000 tons. August will show a pronounced falling off.

With rising prices for coke and pig iron, finished steel, where bought for early delivery, is from $2 to $3 per ton higher. No formal advances have been made by the Steel Corporation, but on plates, shapes and bars a quotation below 1.80c., Pittsburgh, is rare. Independent makers have been freely quoting 2c. and from that to 2.15c.

The market is being largely made by the smaller consumers who have been able, in many cases, to struggle along with better success than some larger ones.

The common belief that an early ending of both coal and railroad strikes would not avert the more serious shutdowns the steel trade sees ahead has been laid formally before the Commerce Commission. The Associated General Contractors of America protest that unless the priorities plan is modified, much construction work will be stopped. It is pointed out that with 291,000 cars per week taken for coal movement only 33,000 open top cars weekly would be available for all other purposes.

That contract buying has not been halted by high prices appears from further new car and car repair orders. Locomotives bought in July numbered 353, the largest month in the year. At Cleveland 10,000 tons of plates and shapes were placed with the Carnegie Steel Co. for two new Detroit and Cleveland passenger boats and 4,600 tons for a new ore freighter. Standard Oil Co. tank plates amount to 15,000 tons.

Rail mills are having little to do, but the Southern Pacific has placed about 47,000 tons for 1923 with the Alabama mill.

More blast furnaces have had to withdraw from the pig iron market and again advances have been made of $1 and $2 per ton. Most foundries have iron on hand or on contract, and the present buying is to provide against a more acute scarcity expected in the fall. Blast furnaces are counting on high fuel costs, even though not at the present extreme, throughout the year.

Pittsburgh

Trend of Plant Activity Still Downward—Prices Mount on Small Purchases

PITTSBURGH, Aug. 8.—Iron and steel plant activities in this and adjacent territory slowly but steadily are tapering off as a result of the increasing shortage of fuel. There has been a further net loss of three furnaces. The Dover furnace of Hanna Furnace Co., Dover, Ohio, was banked yesterday, while Youngstown Sheet & Tube Co. and the Cambria Steel Co. each has retired one furnace. The Carnegie Steel Co., in closing down its Farrell, Pa., steel works last Saturday, also banked two of the three blast furnaces at the plant, but this curtailment has been offset by turning on the blast once more in two of the Carrie furnaces which were banked late last week. Several other furnaces are on the ragged edge and another week probably will tell the story of additions to the idle list.

Outside of the Youngstown district, which is suffering most from the fuel shortage, there has not been

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Aug. 8 1922	Aug. 1 1922	July 11 1922	Aug. 9 1921
No. 2X, Philadelphia‡	**$31.14**	$29.76	$27.64	$19.84
No. 2, Valley furnace†	**29.00**	28.00	24.00	19.50
No. 2, Southern, Cin'ti†	**24.05**	22.55	21.53	23.50
No. 2, Birmingham, Ala.†	**19.50**	18.50	18.00	19.00
No. 2 foundry, Chicago*	**27.00**	26.00	24.00	18.25
Basic del'd, eastern Pa.	27.25	27.25	25.75	20.26
Basic, Valley furnace	**26.00**	25.00	24.00	18.00
Valley Bess. del. Pitts.	**28.76**	26.76	26.77	21.96
Malleable, Chicago*	**27.00**	26.00	24.00	18.50
Malleable, Valley	**28.00**	27.00	24.50	20.00
Gray forge, Pittsburgh	**28.76**	27.76	25.27	21.46
L. S. charcoal, Chicago	33.15	33.15	31.65	33.50
Ferromanganese, seaboard	67.50	67.50	67.50	70.00

Rails, Billets, Etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$40.00	$40.00	$40.00	$47.00
Bess. billets, Pittsburgh	35.00	35.00	35.00	30.00
O.-h. billets, Pittsburgh	35.00	35.00	35.00	30.00
O.-h. sheet bars, P'gh	35.00	35.00	35.00	32.00
Forging billets, base, P'gh	40.00	40.00	40.00	35.00
O.-h. billets, Phila.	**42.67**	40.17	40.17	35.74
Wire rods, Pittsburgh	40.00	40.00	40.00	42.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	**1.80**	1.70	1.70	1.75
Light rails at mill	1.75	1.75	1.75	1.85

Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.025	2.025	1.925	2.05
Iron bars, Chicago	2.00	2.00	1.80	1.75
Steel bars, Pittsburgh	**1.80**	1.70	1.70	1.75
Steel bars, Chicago	**1.90**	1.75	1.75	2.13
Steel bars, New York	**2.14**	2.04	2.04	2.13
Tank plates, Pittsburgh	**1.80**	1.70	1.70	1.80
Tank plates, Chicago	**1.90**	1.75	1.75	2.18
Tank plates, New York	**2.14**	2.04	2.04	2.18
Beams, Pittsburgh	**1.80**	1.70	1.70	1.85
Beams, Chicago	**1.90**	1.75	1.75	2.23
Beams, New York	**2.14**	2.04	2.04	2.23
Steel hoops, Pittsburgh	2.50	2.50	2.50	2.25

Sheets, Nails and Wire,	Aug. 8 1922	Aug. 1 1922	July 11 1922	Aug. 9 1921
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	3.15	3.15	3.15	3.00
Sheets, galv., No. 28, P'gh	4.15	4.15	4.15	4.00
Sheets, blue an'l'd, 9 & 10	2.40	2.40	2.40	2.40
Wire nails, Pittsburgh	2.40	2.40	2.40	2.75
Plain wire, Pittsburgh	2.25	2.25	2.25	2.50
Barbed wire, galv., P'gh	3.05	3.05	3.05	3.40
Tin plate, 100-lb. box, P'gh	$4.75	$4.75	$4.75	$5.25

Old Material, Per Gross Ton:				
Carwheels, Chicago	$19.50	$19.50	$19.50	$12.50
Carwheels, Philadelphia	17.50	17.50	17.50	16.00
Heavy steel scrap, P'gh	**17.50**	17.00	17.50	12.50
Heavy steel scrap, Phila.	15.00	15.00	15.00	11.50
Heavy steel scrap, Ch'go.	15.50	15.50	15.50	10.25
No. 1 cast, Pittsburgh	19.00	19.00	19.00	16.00
No. 1 cast, Philadelphia	18.00	18.00	17.50	17.00
No. 1 cast, Ch'go (net ton)	**18.00**	17.00	17.00	11.50
No. 1 RR. wrot, Phila.	17.50	17.50	17.00	14.00
No. 1 RR. wrot, Ch'go (net)	14.25	14.25	13.50	9.75

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$14.00	$14.00	$9.50	$2.75
Foundry coke, prompt	**15.00**	14.50	10.00	3.75

Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	14.12½	14.12½	14.00	12.00
Electrolytic copper, refinery	13.75	13.75	13.75	11.75
Zinc, St. Louis	**6.30**	6.25	5.52½	4.20
Zinc, New York	**6.65**	6.60	5.87½	4.70
Lead, St. Louis	**5.50**	5.47½	5.50	4.20
Lead, New York	**5.85**	5.80	5.75	4.40
Tin (Straits), New York	*32.62½*	32.75	31.12½	27.75
Antimony (Asiatic), N. Y.	5.25	5.25	5.00	4.60

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price, Aug. 8, 1922, Finished Steel, 2.212c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

- Aug. 1, 1922, 2.169c.
- July 11, 1922, 2.169c.
- Aug. 9, 1921, 2.364c.
- 10-year pre-war average, 1.689c.

These products constitute 88 per cent of the United States output of finished steel

Composite Price, Aug. 8, 1922, Pig Iron, $25.94 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

- Aug. 1, 1922, $24.38
- July 11, 1922, 23.61
- Aug. 9, 1921, 18.52
- 10-year pre-war average, 15.72

very much decline in steel works operations. This may be explained by the fact that most companies have some stocks of iron to draw upon and are increasing the scrap content of the charge and using fuel oil and natural gas as the melting agent. The Carnegie Steel Co. is meeting the situation by concentrating in its Monongahela river plants and slowing down at its outlying plants which are more difficult to provide with fuel than those in the former districts. An early possibility is the banking of two Mingo, Ohio, furnaces and the starting up of two Clairton stacks. Such a course is not open to other companies and as supplies of raw materials become exhausted, suspensions will follow.

Early termination of the rail and coal strikes, it is believed, would have little effect in staying the downward trend of plant activities, because of the low place occupied by the steel industry in the priority schedule. Although the supply situation is growing steadily tighter in steel and promises to be much worse before it is better, it is commented upon that there is so little excitement among consumers and that pressure for shipments is much less urgent than in other periods of shortage. Users of plates are urging shipments of material due them on orders, but in all other cases, with the possible exception of pipe, buyers appear to be satisfied to bear their part in a condition for which the steel manufacturers are in no wise responsible.

The market is being made these days by the smaller consumers who thus far have been able to struggle along with greater success than the larger consumers. This also is the case with pig iron, demand for which is for small tonnages for small users. Prices are reflecting such buying, further advances of $1 to $2 a ton having been established in pig iron, while on the major steel products 1.70c. is fast disappearing, except for very indefinite delivery, and the more common minimum now is 1.80c. Cold finished steel bars have advanced $3 a ton and higher prices also have been established on track supplies. Desirable scrap is hard to obtain except at stiff prices and fuel remains costly since the machinery for enforcing the priority system has not yet been set up.

Pig Iron.—Business of the past week has been of very small proportions, but the growing scarcity of available supplies as well as high costs find full reflection in prices. There no longer seems to be any foun-

dry iron at less than $29, Valley furnace, for No. 2, and small sales of this grade have been made from a western Pennsylvania furnace as high as $30. Prices of such lots of low silicon foundry iron as are left naturally are enhanced in value by the advance in the base grade. Although sales of the steel-making grades are very limited and usually of tonnages not regarded as quotation making lots, prices are up $1 to $2 in recognition of the fact that merchant producers have little iron and the steel companies are melting instead of offering for sale stocks they have on their yards. Quotations to a large degree now are an appraisal of to-day's possibilities, since their basis in sales is a small one.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$26.00
Bessemer	27.00
Gray forge	27.00
No. 2 foundry	29.00
No. 3 foundry	27.00
Malleable	28.00

Ferroalloys.—There is no special change in general conditions. Such business as is doing in ferromanganese is in small lots, usually of less than carloads, on which as high as $85 per ton, Atlantic seaboard, is said to have been obtained. On large lots, the quotable prices are unchanged, with British material still offered, subject to cabled confirmation, for September delivery, at $67.50. Eastern seaboard. On spot tonnages as high as $75 is quoted, but the most recent business was at $70 and on sales the market is not over $72.50. Spiegeleisen is almost impossible to obtain for early delivery. Domestic producers are sold up over the remainder of the year and while some British material is reported to be lying in New York, it is held above the prices that consumers feel they can afford to pay. Little interest is displayed in ferrosilicon or silvery iron.

We quote 78 to 82 per cent ferromanganese, $67.50 c.i.f. Atlantic seaboard for domestic; British, spot, $72.50; British, future, $67.50; German, 76 to 80 per cent, $66. Average 20 per cent spiegeleisen, $36 furnace; 16 to 19 per cent, $35 furnace; 50 per cent ferrosilicon, domestic, $55 to $60 furnace, freight allowed. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, $41.50; 11 per cent, $44.80; 12 per cent, $48.10; 13 per cent, $52.10; 14 per cent, $55.10; silvery iron, 6 per cent, $30; 7 per cent, $31; 8 per cent, $32.50; 9 per cent, $34.50; 10 per cent, $36.50; 11 per cent, $39; 12 per cent, $40.50. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $4.06 per gross ton.

Billets, Sheet Bars and Slabs.—Although steel works operations in this district are not suffering as much from the fuel shortage as are the blast furnaces, there has been some contraction and available supplies of billets, sheet bars and slabs are very limited. Open hearth operations are sustained fairly well by the use of fuel oil and natural gas and the raising of the scrap content in the charge, but this practice adds to costs, particularly, since a number of steel companies lately have been finding it hard to obtain satisfactory scrap except at high prices. It is reported that on small tonnages of forging billets, which were urgently needed, as high as $45, has been obtained and $40 is said to have been quoted against a recent sheet bar inquiry. We continue to regard $35 as a fair appraisal of the present market on sheet bars, slabs and large soft billets, but there is little question that this price would be exceeded if consumers had to have supplies in a hurry. Very few really urgent demands are current.

We quote 4 x 4-in. soft Bessemer and open-hearth billets at $35; 2 x 2-in. billets, $35; Bessemer and open-hearth sheet bars, $35; slabs, $35; forging billets, ordinary carbons, $40, all f.o.b. Youngstown or Pittsburgh mills.

Wire Rods.—The market is nearer $43, base, than it is $40, although the leading interest as yet has made no announcement of an abandonment of the latter price. Independent makers are reluctant about taking on additional business in view of the uncertainty as to continued operations, on account of the coal situation, but regard $43 as the market if they do take on any orders. There is one inquiry for 2000 tons before the market and no scramble among producers to get it.

We quote No. 5 common basic or Bessemer rods to domestic consumers, $40 to $43; chain rods, $40 to $43; screw stock rods, $45 to $48; rivet and bolt rods and other rods of that character, $40 to $43; high carbon rods, $47 to $53, depending on carbon, per gross ton, f.o.b. Pittsburgh or Youngstown.

Iron and Steel Bars.—The market on steel bars is moving away from its recent minimum of 1.70c., base, Pittsburgh, and while some business might be taken by one or two makers from regular customers for indefinite delivery at that price, the more common minimum for relatively early shipments is 1.80c., and 2c. and even more is being asked by those in position to make prompt shipments. Leading mills have pretty heavy obligations and only one or two seem willing to take on fresh business. New demands in reinforcing bars are lighter than they have been, but early shipments are as hard to obtain as in ordinary steel bars. Rail steel bars are firmer in sympathy with those rolled from billets and also because of the higher market in rails for rerolling.

We quote steel bars rolled from billets at 1.70c. to 1.90c.; reinforcing bars, rolled from billets, 1.70c. to 1.90c. base; rail steel reinforcing bars, 1.70c. to 1.75c.; refined iron bars, 2.25c. in car loads, f.o.b. mill, Pittsburgh.

Structural Material.—The price situation is getting stiffer as a result of the hindrances to production created by the coal and rail strikes. Mill obligations exceed probable production over the next few months and manufacturers who have not withdrawn from the market are picking their new orders. Where early delivery is essential buyers are having difficulty in interesting the mills at a price of less than 1.80c., Pittsburgh. Fabricating interests report a good inquiry, but the uncertainty as to deliveries is holding up awards. Plain material prices are given on page 383.

Plates.—Makers are heavily committed and a number of them, on account of the uncertain operating outlook, cannot consider new business even at premium prices. On small tonnages 2c., base, Pittsburgh, is not out of the question and on large lots only preferential customers are able to interest the mills in tonnages at less than 1.80c. That there should be a shortage of plates in view of the expansion of capacity during the war is surprising, but probably finds its explanation in the fact that a considerable percentage of capacity could not be operated profitably at the prices that prevailed early in the year, and such capacity cannot now go on with the production of steel on the downgrade. Prices are given on page 383.

Steel Skelp.—The shortage of supplies, especially of grooved, is as acute as ever and the tendency of prices is upward. Operation of butt weld pipe furnaces is restricted because of the scarcity of grooved skelp, which is explained largely by the curtailment of Bessemer plant operations. While 1.70c. still can be done on sheared skelp, this price is disappearing and the market is moving strongly toward a minimum of 1.80c. As much as 2c. is being paid for narrow grooved skelp.

Wire Products.—It is fortunate that demands upon producers are not heavy, for all of them have obligations against which they are not making much progress owing to the effect of the coal shortage on steel production. Increasing costs are indicated and there is not anxiety for additional business. One large independent company has practically withdrawn from the market, taking only such orders as it is reasonably certain of being able to fill, while another is taking business only on a day to day basis. All makers are behind in their deliveries on the smaller sizes of nails. Most of the business now on makers' books is at the Steel Corporation prices. Independent companies, however, have never formally abandoned the advances over those prices set up early in April. Quotations are on page 383.

Steel Rails.—Makers of light rails are showing increased indifference to new demands. One of the independent producers is refusing all business except that which can be supplied from stock, while the Carnegie Steel Co. has orders sufficient to engage rolling capacity for the next three or four weeks. The mill base still is 1.75c. for those rolled from new billets, but stock shipments are priced as high as 2c., base. Light rails rolled from old standard sections are held a little more firmly.

We quote 25 to 45-lb. sections, rolled from new steel, 1.75c. base; rolled from old rails, 1.65c. to 1.70c. base; standard rails, $40 per gross ton mill for Bessemer and open-hearth sections.

Iron and Steel Pipe.—The supply situation in standard pipe has become so acute that makers now actually welcome cancellations. The shortage of coal threatens to bring a considerable curtailment of production soon and actually has affected manufacturers in the outlying districts. Bessemer departments of both of the Youngstown manufacturers now are idle and this affects production of the butt weld sizes, for which the demand is strongest. All makers, including the National Tube Co., which thus far has not suffered very much loss of output, now are taking on new business in standard pipe with considerable conservatism. Lap welded pipe is more readily available because of the relatively high operation of open hearth furnaces, and the fact that there is some open hearth steel for pipe. An inquiry for 100 miles of 10-in. 35-lb. to 40-lb. line pipe is reported, but the identity of the prospective buyer is not disclosed. Makers of wrought iron pipe are having difficulty in catching up with their obligations in standard pipe. Discounts are given on page 383.

Sheets.—The coal shortage has cut more heavily into operations of Steel Corporation mills than those of the independents. Closing down of the Farrell, Pa., steel works of the Carnegie Steel Co. means a reduction in the allotment of sheet bars to nearby mills of the American Sheet & Tin Plate Co. and a further reduction in steel supplies or an increase in the delivered price is probable from the plan of the Carnegie Steel Co. to concentrate steel works activities in its Monongahela river plants. About 60 per cent of the American Sheet & Tin Plate Co. mills are engaged this week. Some of its plants, fairly well fixed with regard to coal supplies, have no steel, while others having steel, lack coal. Moving the coal to plants having the steel is not attempted because of the danger that it would be seized for preferential consumers or confiscated by the railroads. Slowing down of independent steel works is likely to tell soon on independent sheet mill activities now averaging about 80 per cent. In spite of the prospect of a further backing up in deliveries on contracts, the market is not excited, as buyers seem to regard the situation as one which cannot be helped. With the exception of the agricultural implement manufacturers, no class of sheet consumers has a good claim for preferential treatment in car priorities, which now are getting consideration in view of orders that all cars suitable for the purpose be kept available for moving coal. With the possible exception of automobile sheets, delivery premiums are being paid on only a small part of the current shipments. We make no change in prices, the full range of which are given on page 383.

Tin Plate.—Active independent capacity still exceeds that of the leading interest, the independent mills in this and nearby districts being quite fully engaged as against slightly less than 60 per cent of the Steel Corporation units. This alignment reflects a divergence in steel supplies rather than in orders. A movement by perishable food container manufacturers to secure preferential treatment on car supplies for tin plate shipments does not find much support among manufacturers, who believe that the pack now will suffer little for want of cans. Shortage of steel probably will force a curtailment of production only a little earlier than usual. It is probable that most manufacturers will be able to complete most of their third quarter obligations, and few had any beyond Oct. 1. Prices are unchanged except that owing to the tight steel situation there is less shading of the regular quotation, except to those who usually have preferential treatment.

Boiler Tubes.—Not much activity is observed in charcoal iron tubes, but steel tubes are wanted, the demand being especially brisk for seamless tubes in connection with the heavy orders for new locomotives and for locomotive repairs. Suggestions of higher prices for lap weld tubes are frequent, because it is claimed that costs have risen to a point where present prices are without profit. Discounts are given on page 383.

Cold Finished Steel Bars and Shafting.—There has been a general advance of $2 per ton since a week ago, makers of cold drawn, rolled and turned material now quoting a base of 2.25c. base Pittsburgh, for carloads, and 2.50c. for less than carloads, while ground shafting now is priced at 2.65c. base, f. o. b. mill, for carloads and 2.90c. for less than carloads. This development finds its principal explanation in the scarcity and strength of hot-rolled bars.

Hot-rolled Flats.—There is no change in prices, all makers quoting 2.50c. base on orders from regular customers for the ordinary run of sizes and gages, but demanding a premium of $5 per ton for the light, narrow material or for early delivery of the easily rolled sizes. New demands for cotton ties are almost entirely absent as the business of the season has been closed and the ties rolled. It is, therefore, only a matter of specifications and deliveries during the remainder of the season. Prices on hot-rolled flats are given on page 383.

Cold-rolled Strips.—There is no change in prices. Where buyers insist on specified deliveries most makers are asking 4.25c. base, Pittsburgh, but regular customers of the various makers still are able to find accommodation if willing to accept delivery at makers' convenience at 4c. Most of the current shipments carry a price of less than 4c.

Nuts and Bolts.—Although buyers quite generally entered orders for their third quarter requirements prior to July 1, it is evident that on account of the steel scarcity they are not getting full shipments of contract specifications, since in the past week or two, new demands have been fairly numerous and rather insistent. Discounts printed on page 383 are closely observed on new orders.

Rivets.—Buyers are specifying freely on contracts and much new business is coming out despite the advance of $5 per ton in prices two weeks ago. Leading makers deplore a runaway market, but fear that still higher prices may result from the scarcity and high cost of bars and rods. Discounts are given on page 383.

Track Supplies.—Advances of $2 to $3 per ton lately have been announced by several makers of spikes. Local makers now are quoting large spikes at $2.35 base per 100-lb. and small spikes and bolt and barge spikes at $2.75 base per 100-lb. A leading Eastern maker who recently has been quoting $2.35 and $2.75, late last week advanced to $2.50, and $3, respectively, for large and small spikes. Track bolts also are firmer, being quoted at $3.25 to $3.50 base per 100-lb. for carloads and an attempt lately has been made by some to restore the old differential of 1c. per lb. on less than carload lots. Demand for both spikes and bolts is rather brisk for small lots, but the chief reason for the advance is the increasing strength of the market in steel bars. Prices are given on page 383.

Coke and Coal.—Available supplies of coke do not seem to increase much in spite of the gain in beehive oven production, and while the furnaces are buying very little, there seems to be an outlet in other directions at well sustained prices. It is reported that some furnace coke recently has been offered as low as $13.50 per net ton at oven, but to-day such fuel is not to be had at less than $14, and some sales have been made at $14.50, although for other than blast furnace use. On foundry grade the minimum is $15 per net ton at oven and from that up in accordance with the buyer's ability to pay. The Pittsburgh Crucible Steel Co. is offering some by-product foundry coke at $16 per net ton, f.o.b. Midland, Pa. Coal prices remain high because as yet there has not been very full application of the priority system. Sales of nearby coal range anywhere from $7 per net ton at mines for steam grade up to $8 for small lots of lump gas coal.

Old Material.—The market is showing a stronger tendency on the better grades of open hearth material, due to the fact that offerings are very limited while melters have found cheap offerings are very unsatisfactory. One independent steel company here is offering $17.50 for No. 1 heavy melting steel and is not

(*Continued on page* 382)

Chicago

Further Curtailment—Broad Active Buying —Higher Iron and Steel Prices

CHICAGO, Aug. 8.—Owing to the increasing scarcity of fuel, the operating situation in the Chicago district has reached a crisis and another two weeks may see a number of important iron and steel producers entirely idle. Coal stocks have fallen to a dangerously low point and even those furnaces and mills that have their own mines have no assurance that their output will not be allocated to preferred industries. Under the priorities ruling coal can be bought only by making full payment in advance to the State authorities and then to wait one's turn in the hope that the order will go through after the demands of those in the preferred list have been filled. Shortage of open top equipment, congestion and embargoes on the railroads have all operated to complicate the situation and to make the delivery of coal exceedingly uncertain even after it is en route.

The Illinois Steel Co. has been forced to suspend the operation of two additional blast furnaces, having banked one at South Chicago and having blown one out for relining at Joliet. This makes a total loss of six blast furnaces in two weeks, reducing the number of its active stacks to 14 out of 29. Through the greater use of scrap the company is maintaining a steel output of 78 per cent, which was its rate of operation a week ago. The Inland Steel Co. is still on a 65 per cent basis.

Notwithstanding the gloomy production outlook, demand for steel is holding up remarkably well. For a leading local mill, last week was one of the heaviest in the year in new orders booked and specifications were also above the average. New buying covers practically every finished steel commodity except rails and is heaviest in plates, shapes and bars. Conspicuous among purchasers are the railroad car builders, the railroads and the automobile plants. Agricultural implement makers are also increasingly active in the market and among users of minor importance steel sash manufacturers have been placing large orders. Much of this business is being closed despite the fact that definite delivery cannot be promised by the mills and in fact present shipments are being allocated among customers because of curtailed output. The slowing up of mill deliveries is affecting the operations of users adversely. The output of railroad carbuilders has been curtailed not only on account of a shortage of steel, but slow deliveries of lumber, specialties, coal shortage and in some instances labor scarcity.

Rising costs have again forced an advance in finished steel products and pig iron. Plates, shapes and bars have gone up to a minimum of 1.90c., Chicago, for shipment at mills convenience, while merchant pig iron is now quoted at $27 to $28, base furnace. Steel for prompt shipment is difficult to obtain and is commanding increasing premiums.

Pig Iron.—Rising fuel costs have again resulted in an advance of local merchant iron, the new minimum for contract iron being $27, base furnace, while spot iron is commanding $28. Future business is comparatively light, but spot iron is active. Both Northern and Southern iron are difficult to obtain for prompt shipment, however, the former because of prior commitments and the latter because of transportation difficulties, which are holding back shipments from the South. Of forward business recently placed a sale of 1000 tons of Northern foundry for September to November delivery stands out prominently. Among the few large inquiries outstanding are 1000 tons of Southern foundry, wanted by an Illinois melter, for fourth quarter, and 500 tons and 200 tons of 8 per cent silvery, respectively, wanted by Wisconsin and Illinois users for the same delivery. A recent sale of copper free low phosphorus iron in this district was closed at $34, Valley furnace. Small lots of charcoal have been sold at the new base of $30, furnace. An English inquiry for a small tonnage of charcoal iron has been received in this market.

Quotations on Northern foundry, high phosphorus malleable and basic irons are f.o.b. local furnace and do not include a switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards, or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$33.15
Northern coke, No. 1, sil. 2.25 to 2.75	$28.00 to 29.00
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	27.00 to 28.00
Northern high phos.	27.00 to 28.00
Southern No. 2	26.00
Malleable, not over 2.25 sil.	27.00 to 28.00
Basic	27.00 to 28.00
Low phos. Valley furnace, sil. 1 to 2 per cent copper free	34.00 to 35.00
Silvery, sil. 8 per cent	37.29

Ferroalloys.—A local user has purchased a car of spiegeleisen at $46, delivered, but there is little additional material available at that price and an early advance is looked for. A carload inquiry for ferromanganese is current.

We quote 78 to 82 per cent ferromanganese, future, $75.06; prompt, $82.56, delivered; 50 per cent ferrosilicon, $57, delivered; spiegeleisen, 18 to 22 per cent, $46, delivered.

Bars.—Demand for soft steel bars is heavier than for any other finished steel product. Buyers, however, are finding it difficult to obtain material, particularly for specific delivery. The minimum local price for indefinite delivery has advanced to 1.90c., Chicago. The Inland Steel Co. has withdrawn all quotations. For reasonably early shipment the going market appears to range from 2.25c., delivered Chicago, upward. Fuel shortage and labor scarcity are a source of great concern to mills rolling bar iron, but it is still possible to place orders for this product at 2c., Chicago. Rail steel bars have advanced to a minimum of 1.80c., f.o.b., or Chicago. A strike of mill operators has forced the two Chicago Heights rail steel bar plants to suspend operations.

Mill prices are: Mild steel bars, 1.90c. to 2c., Chicago, for indefinite delivery; common bar iron, 2c., Chicago; rail steel, 1.80c., mill or Chicago.

Jobbers quote 2.60c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.55c. for rounds and 4.05c. for flats, squares and hexagons. Jobbers quote hard and medium deformed steel bars at 2.38c. base; hoops, 3.60c.; bands, 3.35c.

Bolts and Nuts.—Some business is still being placed at the discounts of May 11, but with raw material increasing in price and bolt production endangered by the fuel shortage, the tendency is toward greater firmness at the July 1 price. The automobile plants, which have been heavy buyers of bolts and nuts, are in danger of early shutdowns owing to lack of coal. The Ford Motor Co. has only two weeks' supply of fuel on hand. Discounts on page 383 apply in this territory, except that they are f.o.b., Chicago, instead of f.o.b., Pittsburgh.

Jobbers quote structural rivets, 3.25c.; boiler rivets, 3.35c.; machine bolts up to ¾ x 4 in., 50, 10 and 10 per cent off; larger sizes, 50 and 10 off; carriage bolts up to ¾ x 6 in., 50 and 5 off; larger sizes, 45 off; hot pressed nuts, squares and hexagons, tapped, $3.25 off; blank nuts, $3.50 off; coach or lag screws, gimlet points, square heads, 60 per cent off; quantity extras are unchanged.

Wire Products.—New business last week showed a big increase over the four weeks previous. Apparently jobbers find that they must again replenish stocks and it is probable also the serious turn of the fuel situation in relation to mill operations accounts for the sudden desire of many buyers to have their orders entered on the books. Orders from the South are conspicuous, reflecting the improved conditions in that section following the marketing of this year's cotton crop at advantageous prices. Business is also good from Northern and Western agricultural sections, except where harvesting has temporarily stopped buying. The demand for nails is very heavy and barbed wire and staples are also much sought after. For mill prices see finished iron and steel, f.o.b., Pittsburgh, page 383.

We quote warehouse prices, f.o.b. Chicago: No. 9 and heavier black annealed wire and No. 9 and heavier bright basic wire, $2.95 per 100 lb.; common wire nails, $3.10 per 100 lb.; cement coated nails, $2.60 per keg.

Sheets.—The local source of supply has been largely cut off owing to the fact that the independent producer

has withdrawn from market and the Gary steel mills have been shut down because of shortage of fuel. Demand is still insistent.

Mill quotations are 3.15c. to 3.30c. for No. 28 black, 2.40c. to 2.50c. for No. 10 blue annealed and 4.15c. to 4.30c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote blue annealed, 3.75c.; black, 4.45c.; galvanized, 5.45c.

Plates.—The Standard Oil Co. has placed 33 oil storage tanks of 80,000-bbl. capacity for erection at Casper, Wyo. Of these 25 will be fabricated by the American Bridge Co. and 8 by the Chicago Bridge & Iron Works. The steel, aggregating 10,000 tons, will be rolled by the Illinois Steel Co. There are said to be other sizeable tank inquiries in the market but negotiations are being carried on quietly. Demand for plates is even heavier than in recent weeks, notwithstanding declining mill operations. The leading producer has advanced its price on material for delivery at mills convenience to a minimum of 1.90c., Chicago. The Inland Steel Co. is out of the market. Plates for reasonably early delivery are difficult to obtain even from Eastern mills on a Pittsburgh base.

The mill quotation for indefinite delivery is 1.90c. to 2c., Chicago. Jobbers quote 2.70c. for plates out of stock.

Structural Material.—The future course of construction is dependent on the outcome of the two national strikes. While there is much new work in progress, the increasing difficulty experienced in securing steel and other materials is resulting in the postponement of many projects. Fabricating awards, however, are still on encouraging proportions. Plain material has advanced to a minimum of 1.90c., Chicago, for shipment at mills convenience. The leading independent, however, has withdrawn from the market. Buyers are finding it difficult to obtain material for reasonably prompt delivery from any source, even when they are willing to pay as high as 1.90c. to 2c., f.o.b. Pittsburgh.

The mill quotation on plain material for indefinite delivery is 1.90c. to 2c., Chicago. Jobbers quote 2.70c. for plain material out of warehouse.

Reinforcing Bars.—The realization that steel mill operations are being sharply curtailed on account of the shortage of fuel has resulted in releasing many orders from buyers who have not yet covered their requirements. In many cases these users are asking for considerably more tonnage than they absolutely need, believing, no doubt, that with warehouses giving them only part of what they ask for, they will still receive all the tonnage that they imperatively require. Lettings and inquiries of reinforcing steel are still numerous, although it is realized that if the coal and railroad strikes continue, building operations will be affected adversely. The warehouse price on deformed reinforcing bars is still 2.38c., Chicago, but an early advance is looked for in view of the increasing scarcity of steel. Recent awards include:

Harbor View Apartment, Chicago, 350 tons, to Paul J. Kalman Co.

Bridge, Riverside, Ill., 100 tons, to Paul J. Kalman Co.

Holeproof Hosiery Co., Milwaukee, Wis., 100 tons, to Concrete Steel Co.

Little Sisters of the Poor Asylum, Kansas City, Mo., 200 tons, to Concrete Steel Co.

Edwards Motor Car Co., Milwaukee, 100 tons, to Truscon Steel Co.

Pending business includes:

Memorial building, Purdue University, LaFayette, Ind., 182 tons.

Grain elevator, Kansas City, Mo., 800 tons.

Sovereign Hotel, Chicago, 300 tons.

Louisville Gas & Electric Co., building, Louisville, Ky., 300 tons, to Concrete Steel Co.

H. & M. Body Corporatioin plant, Racine, Wis., 100 tons, to Corrugated Bar Co.

Atchison, Topeka & Santa Fe, office building, Newton, Kan., 150 tons, to Corrugated Bar Co.

Headquarters and service building, Edwards Motor Car Co., Milwaukee, 100 tons, to Truscon Steel Co.

Cast Iron Pipe.—With their books well filled and shop operations endangered by the fuel shortage, pipe makers are not actively competing for new business. At the same time a seasonal dullness has settled on the market, which ordinarily continues until October. Ogden, Utah, has taken bids on 1200 tons and Detroit is in the market for 200 tons of 6 to 8-in. Walbridge, Ohio, takes bids on 200 tons of 4 to 8-in. on Aug. 9.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $50.20 to $51.20; 6-in. and above, $46.20 to $47.20; class A and gas pipe, $3 extra.

Coke.—The local producers quote $12.25, delivered, Chicago switching district, and $13, delivered, Milwaukee, on foundry coke, but these prices are subject to change without notice and the buyer pays the price ruling at time of delivery. A Southern by-product producer is offering foundry coke at similar prices. Deliveries from the South are somewhat better than a week or two ago. Demand for spot coke is exceedingl active and melters are not so much concerned with prices as with deliveries. Connellsville foundry coke is $15 to $17 per net ton at ovens, to which a freight of $4.16 to Chicago must be added. Little Connellsville product is reaching this district, however. Wise County foundry coke with a similar freight rate is quoted at $10 to $11, ovens. A recent sale of 400 tons of spot foundry coke from a Northern by-product plant brought $19.50 delivered, Milwaukee.

Rails and Track Supplies.—The Southern Pacific has placed 50,000 tons of rails for 1923 delivery with the Tennessee mill. The same road has divided an order for 2500 kegs of spikes between the Gary and the Colorado mills. The Missouri, Kansas & Texas has also placed 2500 kegs of spikes, part of which will be shipped by the Gary mills. Demand for track supplies is generally good, with prices unchanged, except on tie plates which have advanced to a minimum of 2c., f.o.b. mill.

Standard Bessemer and open-hearth rails, $40; light rails rolled from new steel, 1.75c., f.o.b. makers' mills.

Standard railroad spikes, 2.25c. to 2.35c., Pittsburgh; track bolts with square nuts, 3.25c. to 3.35c., Pittsburgh; tie plates, steel and iron, 2c., f.o.b. mill; angle bars, 2.40c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.30c. base and track bolts 4.30c. base.

Old Material.—Malleable and cupola grades are in stronger demand, evidently because of the advance in pig iron, and low-phosphorus scrap is also sought after by users. Dealers are avoiding new sales of steel scrap because the supply which is coming on to the market is insufficient even to enable them to fill old orders. Sellers are in a quandary as to what policy to pursue under conditions. As current offerings by producers of scrap are very light, it is difficult to obtain material to apply on orders for prompt shipment. On the other hand, dealers hesitate to buy long, as a continuation of the coal strike will lead to the complete suspension of operations by many users, and hence cut off the demand. The market is stronger than last week, as evidenced by numerous advances, and the trend of prices is expected to keep upward as long as consumers are running their plants. The United States Ordnance Department took bids here to-day on 1400 tons of breakable cast. Railroad offerings include 1800 tons advertised by the Santa Fe and 1200 tons by the Pere Marquette.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton
Iron rails	$19.00 to $19.50
Cast iron car wheels	19.50 to 20.00
Relaying rails	22.50 to 27.50
Rolled or forged steel car wheels	19.00 to 19.50
Rails for rerolling	16.50 to 17.00
Steel rails, less than 3 ft.	18.00 to 18.50
Heavy melting steel	15.50 to 16.00
Frogs, switches and guards cut apart	15.50 to 16.00
Shoveling steel	15.25 to 15.75
Drop forge flashings	11.50 to 12.00
Hydraulic compressed sheet	13.00 to 13.50
Axle turnings	13.50 to 14.00
	Per Net Ton
Iron angles and splice bars	18.50 to 19.00
Steel angle bars	15.00 to 15.50
Iron arch bars and transoms	19.00 to 19.50
Iron car axles	23.00 to 23.50
Steel car axles	15.75 to 16.25
No. 1 busheling	13.00 to 13.50
No. 2 busheling	7.50 to 8.00
Cut forge	14.00 to 14.50
Pipes and flues	11.00 to 11.50
No. 1 railroad wrought	14.25 to 14.75
No. 2 railroad wrought	14.00 to 14.50
Steel knuckles and couplers	16.50 to 17.00
Coil springs	17.00 to 17.50
No. 1 machinery cast	18.00 to 18.50
No. 1 railroad cast	16.50 to 17.00
Low phos. punchings	15.00 to 15.50
Locomotive tires, smooth	13.00 to 13.50
Machine shop turnings	9.50 to 10.00
Cast borings	11.25 to 11.75
Stove plate	14.75 to 15.25
Grate bars	14.50 to 15.00
Brake shoes	15.00 to 15.50
Railroad malleable	16.50 to 17.00
Agricultural malleable	16.50 to 17.00

New York

Scarcity of Pig Iron Accented—Due to Fuel Uncertainty Furnaces Can Offer Little Product

NEW YORK, Aug. 8.—The latest developments in the coal and railroad strikes have made no definite change in iron and steel markets except to accent the scarcity of pig iron. Advices from Buffalo indicate that four blast furnaces have been banked since Aug. 1, leaving only seven out of 22 in operation in that district. More foreign pig iron has been sold, but reports of large contracts in which import firms not in the iron business are said to figure are not substantiated. Foundries in buying foreign iron appear to be dealing with firms having a background of experience in pig iron selling. In finished material firmer prices are reported on sales from local warehouses.

Pig Iron.—Fewer furnaces are offering iron in view of the uncertainty about getting sufficient fuel to make the iron already on their books. A number of foundries have been inquiring, but more with a view to safeguarding themselves for the later fall. Prices are higher both on eastern Pennsylvania and Buffalo irons. A Lehigh Valley seller has advanced its price to $30 at furnace for No. 2X iron. Another eastern Pennsylvania interest has quoted $29 on small lots for early delivery. In the Buffalo district $30 has been named for No. 2X. There is still some Buffalo iron available at lower prices, but all such iron has come from a single seller. Two important foundry interests have bought Scotch iron in the past week, 1000 tons in one case and 650 tons in the other. Some of this iron has sold at $26, New York, but more is being asked to-day. An air brake company has inquired for 500 to 1000 tons of high silicon iron and another interest which buys through New York has inquired for 200 to 300 tons of No. 2X iron. A Connecticut steel plant has been in the market for 3000 tons of basic for September-October delivery, and a western New York railroad supply plant is in the market for 1000 tons of basic. The General Electric Co., which bought for various plants in July, has asked for 500 tons of high silicon iron for its Lynn plant, deliveries from Sept. 1 to Nov. 15. The possibility of a settlement of the soft coal strike has found no response in the market as yet. Such a settlement might probably mean the end of one class of inquiry that has come up in the past two weeks, but it is yet to be seen to what extent foundrymen's expectations of lower prices will be realized. Furnaces look for high fuel for some months to come.

We quote delivered in the New York district as follows, having added to furnace prices $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$32.77 to $33.77
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	31.77 to 32.27
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	30.77 to 31.77
Buffalo, sil. 1.75 to 2.25	31.91 to 32.91
No. 2 Virginia, sil. 1.75 to 2.25	31.44 to 32.44

Warehouse Business.—No changes of price on iron and steel items is noted, but sheets, both black and galvanized, are distinctly firmer and there is far less tendency to undercut the established schedule. This is also true of wrought iron and steel pipe discounts, probably better than 90 per cent of the sales in this line being consummated now at the established discounts. The margin between warehouse and mill prices on toe calk steel is considered too narrow and a slight advance may be made before long. In sympathy with the higher quotations of the mills on cold rolled shafting and screw stock, some warehouses are also contemplating an increase of 10c. to 15c. per 100-lb. Brass and copper prices are strong and in several instances have been marked up ½c. to 1c. per lb. A renewed interest is reported from manufacturers of radio equipment, who have been extremely quiet for the past few weeks. We quote prices on page 402.

High Speed Steel.—The market continues quiet. The few inquiries that recently appeared have evidently been abandoned for the present. Prices are still at about 75c. per lb. for 18 per cent tungsten high speed steel with special brands of some companies ranging up to 95c. per lb.

Ferroalloys.—Demand for ferromanganese continues quiet at unchanged prices. It is reported that offerings of spot alloy have been made at $85 to $90, delivered. Imports have been large as a result of the recent contracts and the desire to receive the alloy before any possible duty takes effect, those for June having been 13,525 gross tons. These receipts compare with an average of 10,000 tons per month in the months just preceding the war when British producers supplied about 50 per cent of the American consumption. The spiegeleisen market is quiet with some producers out of the market. Inquiries aggregate about 500 tons. Importations of British alloy are offered but at a price higher than domestic quotations. Quotations for manganese ore are unchanged but importations are heavy, those for June having been 44,329 tons. There is a quiet demand for 50 per cent ferrosilicon with quotations unchanged and the same is true of ferrochrome. Quotations are as follows:

Ferromanganese, domestic, seaboard, per ton,	$67.50 to $70.00
Ferromanganese, British, seaboard, per ton,	$67.50 to $70.00
Spiegeleisen, 17 to 19 per cent	$35.00
Spiegeleisen, 20 per cent	$36.00
Ferrosilicon, 50 per cent, delivered, per ton,	$52.00 to $55.00
Ferrosilicon, 10 to 15 per cent, delivered, per gross ton	$38.00 to $40.00
Ferrotungsten, per lb. of contained metal	40c. to 50c.
Ferrochromium, 6 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr., delivered	12c. to 14c.
Ferrovanadium, per lb. of contained vanadium,	$3.00 to $3.50
Ferrocarbontitanium, 15 to 18 per cent, in carloads, per net ton	$200.00
Ores	
Manganese ore, foreign, per unit, seaboard	26c. to 30c.
Tungsten ore, per unit, in 60 per cent concentrates, nominal	$3.25 up
Chrome ore, basis 48 per cent Cr_2O_3, crude, per ton, Atlantic seaboard	$15 to $18.50
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	45c. to 50c.

Finished Iron and Steel.—What change has occurred in the past week is increased buying from warehouses to satisfy urgent needs which mills cannot supply. There has also been an increase in bookings at the 2c. Pittsburgh basis, two carloads of plates for example going at this figure and round lots of bars for forging as well as for concrete reinforcing work. Probably 5000 tons of bars, largely for building work, are pending. New buying in the aggregate is of course not large, such has been the check brought upon industry by the strikes. Semi-finished steel is strong, 500 tons of forging quality billets going at $47, Pittsburgh base. Buying at a basis of 1.70c., Pittsburgh, is without any promise as to delivery, while the 2c. basis is for delivery in a few weeks with 1.90c., obtainable on an attractive offering with shipment in a reasonable time and 1.80c. as a minimum for any purchase for definite delivery. Eastern railroads show no interest as yet in rails for next year, though the need of getting a position on rail mill books is being emphasized to insure receiving the material in time for early track work next year.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, structural shapes and steel plates, 2.04c. for indefinite delivery and 2.14c. to 2.34c. for delivery in a number of weeks; bar iron, 2.04c.

Cast-Iron Pipe.—Prices are firm and deliveries continue extended to from two to three months on the smaller sizes and four to six weeks on the large sizes of pipe. No new municipal tenders are noted. The city of Poughkeepsie will open bids on Aug. 10 on the 2500 tons of 24-in. pipe reported last week. Rigid enforcement of priority orders would undoubtedly result in a serious situation among cast-iron pipe makers. Supplies of pig iron on contract are being received in larger quantities than was expected and this, supplemented by small lots of foreign iron under order by some foundries for early delivery distinctly relieves the pig iron situation for pipe foundries. We quote per net ton, f.o.b., New York, in carload lots, as follows: 6-in. and larger, $53.50; 4-in. and 5-in., $58; 3-in., $63.80, with $4 additional for Class A and gas pipe.

Old Material.—Although the market is generally rather quiet, buying of small orders is fairly brisk.

Cast iron is more active at present than steel, and the material showing the greatest activity is that which is most easily converted with the least fuel. Prices on heavy melting steel are strong at $10.50 to $11 per ton, $10.80 having been paid for shipment to Monessen. Stove plate is firm and $11.50 has been paid for Mahwah, N. J. A fair estimate of the market on this material is $11 to $11.50, although some dealers claim that even a higher quotation is warranted. Clean cast borings are stronger than either mixed borings and turnings or machine-shop turnings, being quotable at $9.75 to $10.75 per ton, while the latter are still fairly firm at $9.25 to $10.25. Buying for shipment by barge to Buffalo continues at good prices because of the low rate obtained on all water shipment.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard	$10.50 to $11.50
Steel rails, short lengths, or equivalent	11.25 to 11.75
Rerolling rails	11.50 to 12.00
Relaying rails, nominal	27.00 to 28.00
Steel car axles	17.00 to 18.00
Iron car axles	22.00 to 23.00
No. 1 railroad wrought	12.50 to 13.00
Wrought iron track	11.00 to 11.50
Forge fire	8.00 to 8.50
No. 1 yard wrought, long	11.00 to 11.50
Cast borings (clean)	9.75 to 10.75
Machine-shop turnings	9.25 to 10.25
Mixed borings and turnings	9.25 to 10.25
Iron and steel pipe (1 in. diam., not under 2 ft. long)	9.00 to 9.50
Stove plate	11.00 to 11.50
Locomotive grate bars	11.50 to 12.00
Malleable cast (railroad)	10.50 to 11.00
Cast-iron car wheels	13.00 to 13.50

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast	$18.00 to $19.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	16.50 to 17.00
No. 1 heavy cast, not cupola size	13.00 to 13.50
No. 2 cast (radiators, cast boilers, etc.)	12.00 to 12.50

Philadelphia

No Further Curtailment But Prices Higher on Practically No Buying

PHILADELPHIA, Aug. 8.—While the Eastern steel and pig iron trade is not more seriously affected in its operations than a week ago, there is a good deal of apprehensiveness over the coal situation. The industry understands clearly that as soon as the Government priorities are fully working there will be little, if any, coal left for coke ovens and steel plants, and unless the coal or railroad strike, or both, should end within the next fortnight more widespread contraction of operations is inevitable. Even an early ending of the coal strike would not entirely relieve steel plants and blast furnaces for some weeks, as it is apparent that the Government will handle coal distribution until railroads, public utilities and households are provided for.

The volume of inquiry for steel and pig iron is surprisingly small. The explanation for this apparently is that consumers are not disposed to anticipate their requirements for steel and iron at present high prices when they do not know whether they are going to have coal with which to operate.

For the most part, the trade, including both sellers and buyers, are accepting the situation philosophically, and there is less of the hysteria which has marked former periods of shortage. Meanwhile, prices are advancing, and the past week has brought 2c. steel and above $30 on foundry pig iron.

Pig Iron.—No further curtailment of blast furnace operations has occurred during the past week because of coke shortage, but two of the active furnaces in the East have coke only for about two or there weeks; another has sufficient coke on the ground to last until Sept. 1, while the trade generally is apprehensive that the Government coal priority plan will bring about an almost complete stoppage of pig iron making in this district. The few furnaces that are making foundry iron are not anxious to sell, and there are few inquiries, which indicates that consumers are not anxious to buy at present high prices, especially as they do not know whether they are going to have coal and coke with which to operate. One furnace company is selling No. 2 plain in limited quantities at $30, furnace, but has no No. 2X because the poor quality of its coke makes it difficult to make the higher silicon grades. Another furnace is selling No. 2 plain at $29, furnace, and No. 2X at $30, furnace, but is confining sales to small lots to help out regular customers. High silicon iron, about 3.50 per cent, has been sold at $35, furnace. Consumers apparently are relying almost entirely on shipments on their contracts and are filling in chiefly with small quantities of imported iron, which is selling at higher prices than a week ago. Brokers are asking $26 to $28, Philadelphia, for English iron; $27.50 to $30 for Scotch, while high silicon Scotch, 3.50 to 4 per cent, is offered at $32 to $33, Philadelphia. As high as $27, Philadelphia, has been paid for Continental iron high in phosphorus. A sale of 500 tons of gray forge was made at $27.50, Eastern furnace, while on a smaller lot divided between two consumers a furnace was paid $30, furnace, and the latter iron was not strictly true to standard gray forge specifications. The price of copper bearing low phosphorus iron has been advanced by the two principal Eastern makers to $33, furnace, while standard low phosphorus iron is nominal at $30, but none is obtainable in this district. The quotations on Virginia iron in the table below merely represent the prices at which last sales were made some time ago, as no Virginia iron is to be had, the furnaces in that State having long since cleaned up the stocks which were left over when they were last in operation.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia, and include freight rates varying from 76 cents to $1.64 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$30.14 to 30.76
East. Pa. No. 2X, 2.25 to 2.75	31.14
East. Pa. No. 1X	32.14
Virginia No. 2 plain, 1.75 to 2.25 sil.	29.17 to 30.17
Virginia No. 2X, 2.25 to 2.75 sil.	30.17 to 31.17
Basic delivery eastern Pa.	26.75 to 27.25
Gray forge	29.50 to 31.50
Malleable	29.00 to 30.00
Standard low phos. (f.o.b. furnace)	Nominal
Copper bearing low phos. (f.o.b. furnace)	33.00

Ferroalloys.—Although the nominal price of English ferromanganese remains at $67.50 and the domestic at $70, seaboard, early deliveries cannot be offered, and on sales for prompt shipment $75 has been obtained, and as high as $90 has been quoted. About 1000 tons of imported spiegeleisen on dock at Baltimore has been offered at $40, Baltimore, which is $4 a ton higher than was recently quoted by a leading Eastern maker whose furnace is now out of blast.

Semi-Finished Steel.—Steel makers are not anxious to sell semi-finished steel, and $37.50, Pittsburgh, for rerolling billets now appears to be the minimum quotation on any business that might be considered, while forging billers are quoted at $42.50 or higher, sales having been made at $44, Pittsburgh. Demand is unimportant.

Plates.—While one or two mills are still nominally quoting 1.80c., Pittsburgh, on plates, they are not in a position to accept much business, and are not therefore a real factor in the market. Only two mills are able to promise early deliveries, and are quoting 2c., Pittsburgh. One of these mills is operating on fuel oil and is fairly confident of being able to meet its obligations. The Lukens Steel Co. withdrew from the market after advancing its price from 1.80c. to 2c., Pittsburgh, having taken considerable business last week. The American Locomotive Co. is reported to have placed about 3000 tons with Eastern mills for the New York Central locomotives recently ordered, and the price paid is said to have been 1.80c., Pittsburgh.

Structural Material.—Mills are accepting orders with great caution, if at all, some being entirely out of the market. One Eastern mill has taken all orders recently subject to cancellation by either buyer or seller in the event that coal shortage makes it impossible to operate. The current market for plain material is certainly not under 1.80c., Pittsburgh, when prompt shipment is required, while 1.85c. has been paid in numerous instances.

Bars.—It would be difficult to-day to direct any buyer to a mill that will accept orders for steel bars for early shipment, except, of course, such bars as are rolled from rails or other old steel. The larger makers of soft steel bars are shipping on contracts and declining to take new orders until the coal situation has become

straightened out. In many instances mills are referring their regular customers to jobbers, some of whom have fair stocks on hand. Eastern bar iron makers are quoting 1.70c. to 1.80c. on carloads lots, with the tendency toward the higher figure, and 2c., Pittsburgh, is being charged for less than carloads.

Warehouse Business.—The demand for steel out of stock continues fairly good in view of the tightening mill situation. Prices on sheets have been slightly advanced. We quote for local delivery from Philadelphia warehouses as follows:

Soft steel bars and small shapes, 2.70c.; iron bars (except bands), 2.70c.; round edge iron, 2.90c.; round edge steel, iron finish, 1½ x ½ in., 2.90c.; round edge steel planished, 3.65c.; tank steel plates, ¼-in. and heavier, 2.80c.; tank steel plates, ⅜-in., 3c.; blue annealed steel sheets, No. 10 gage, 3.50c.; black sheets, No. 28 gage, 4.30c.; galvanized sheets, No. 28 gage, 5.40c.; square twisted and deformed steel bars, 2.80c.; structural shapes, 2.80c.; diamond pattern plates, ¼-in., 4.50c.; ⅜-in., 4.50c.; spring steel, 3.50c.; round cold-rolled steel, 3.35c.; squares and hexagons, cold-rolled steel, 3.70c.; steel hoops, No. 13 gage and lighter, 3.75c.; steel bands, No. 12 gage to ⅛-in., inclusive, 3.35c.; iron bands, 3.90c.; rails, 2.70c.; tool steel, 8c.; Norway iron, 5.50c.

Spikes.—An Eastern manufacturer has advanced the price of railroad spikes, 9-16 in. and larger, to 2.50c., base, Pittsburgh; ⅜, 7-16 and ½ in. sizes are now 3c., base, while boat spikes are quoted at 3c., Pittsburgh, in small lots and at 2.50c., Pittsburgh, in lots of 25 kegs or more.

Coke.—The scarcity of coke increases, and it is to be had only at extremely high prices, $14.50, Connellsville, or more. British coke has been offered here at about $14, Philadelphia. By-product coke is available in small lots at $16, Eastern ovens.

Old Material.—A Delaware mill has paid as high as $15.50 for No. 1 heavy melting steel, this being the only activity of importance in steel scrap. Prices hold up very well considering the small demand. Shafting is higher, a sale having been made at $22, delivered. We quote for delivery at consumers' works in this district as follows:

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$15.00 to $15.50
Scrap rails	15.00 to 15.50
Steel rails, rerolling	17.00 to 17.50
No. 1 low phos., heavy 0.04 and under	22.00 to 24.00
Cast iron car wheels	17.50 to 18.50
No. 1 railroad wrought	17.50 to 18.50
No. 1 yard wrought	15.00 to 15.50
No. 1 forge fire	13.00 to 13.50
Bundled sheets (for steel works)	13.00 to 13.50
No. 1 busheling	12.50 to 13.00
No. 2 busheling	10.00 to 11.00
Turnings (short shoveling grade for blast furnace use)	13.00 to 13.50
Mixed borings and turnings (for blast furnace use)	13.00 to 13.50
Machine-shop turnings (for steel works use)	13.00 to 13.50
Machine-shop turnings (for rolling mill use)	13.50 to 14.00
Heavy axle turnings (or equivalent)	14.00 to 14.50
Cast borings (for steel works and rolling mills)	14.00 to 14.50
Cast borings (for chemical plants)	17.00 to 17.50
No. 1 cast	18.00 to 20.00
Railroad grate bars	14.50 to 15.00
Stove plate (for steel plant use)	15.00 to 15.50
Railroad malleable	15.00 to 15.50
Wrought iron and soft steel pipes and tubes (new specifications)	13.00 to 13.25
Shafting	21.00 to 22.00

Cincinnati

CINCINNATI, Aug. 8.

Pig Iron.—Demand for small tonnages for fill-in purposes constituted the only activity in the market in the past week. With shipments held up on account of the railroad situation local melters are running short of iron, and are forced to borrow from one another to keep going. The result of this condition is seen in higher prices for prompt shipment material, the Southern market having advanced at least $1 in the week, and southern Ohio irons a similar amount. Sales range all the way from carload to 500-ton lots. A central Ohio melter bought 500 tons of Northern iron on a $26, Ironton, basis, and a West Virginia melter 600 tons at the same price. We note a sale of 300 tons of Southern resale iron to an Indiana melter on an $18.50, Birmingham, basis, but against this are numerous sales by furnaces ranging from $20 to $21. Practically all Southern furnaces are sold up for third quarter, and are out of the market for the time being. Shipments are being held back by the rail strike, and tonnages shipped around the middle of July have not yet reached their destination. No furnaces have been banked in this district during the week, but considerable difficulty is being experienced in securing enough coke to operate.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$24.05
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	24.55
Ohio silvery, 8 per cent	34.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	28.27
Basic Northern	27.27
Malleable	28.27

Fluorspar.—There is a fair number of small inquiries, but most steel plants have abandoned the market until the fuel situation improves. Prices are unchanged at $17.50 for guaranteed material.

Plant Operations.—The coal and rail strikes have not caused much inconvenience to steel mills operating in this district. The Middletown works of the American Rolling Mills Co. are operating at full capacity, and even with the coal shortage, the company does not anticipate a shutdown, as supplies of natural gas and fuel oil are available to keep the plant running in addition to a fair supply of coal now in stock. At Zanesville the company is operating all its mills, and at Ashland, Ky., a 50 per cent operation in its finishing capacity is being maintained, despite delays due to lack of transportation facilities. The Whitaker-Glessner Co. at Portsmouth is operating at its schedule of last week, and while some inconvenience has been experienced at the plants of the Andrews Steel Co. and Newport Rolling Mill Co. at Newport, Ky., it has not been necessary to curtail operations. All the blast furnaces active last week continue in blast, and it now looks as though the worst of the strike period has been left behind, as railroad movements of freight, including coal, are very much improved over a week ago.

Finished Material.—A slackening up in demand was noted in the past week. Whether this is due to the fact that consumers are pretty well supplied, or to the curtailment of manufacturing operations on account of transportation problems, is difficult to ascertain. New business is not in such volume as during the past several weeks, but specifications on contracts continue to come at a good rate. Consumers are sending in orders for their fourth quarter requirements, but books have not been opened by any mills for this delivery, prices are on the upward trend, and for early delivery as high as 2c. has been paid for bars, shapes and plates. The usual range, however, is still from 1.70c. to 1.90c., the former price carrying no definite delivery promises, and the latter from eight to ten weeks. A Youngstown plate mill, which started up last week, is understood to be booking tonnage at 2c. The demand for sheets has shown a considerable falling off, though prices are well maintained, and for early delivery, six to eight weeks, 3.30c. for black, and 4.30c. for galvanized is easily obtained. Slowing up of the automobile trade is noted in a lessened demand for automobile body sheets, although manufacturers of accessories, such as lamps, radiators and fenders are still good buyers. There has been little activity in the structural field, and no awards involving any considerable tonnages of reinforcing bars have been made in this district. It is reported that a Cleveland district mill, which makes a specialty of reinforcing bars, has raised its price to 2.75c., mill, with engineering service included.

Warehouse Business.—Local jobbers report a continuation of the excellent business enjoyed during the past six weeks, and stocks are being rapidly depleted. Prices are very firm, but unchanged.

Jobbers quote: Iron and steel bars, 2.75c. base; hoops, 3.60c.; bands, 3.35c. base; shapes and plates, 2.85c. base; reinforcing bars, 2.82½c. base; cold-rolled rounds, 3.50c. base; flats, squares and hexagons, 4c. base; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, 4.50c.; No. 28 galvanized sheets, 5.50c.; No. 9 annealed wire, $2.70 per 100 lb.; common wire nails, $2.85 per keg, base.

Tool Steel.—A material slowing up is evidenced in the demand for high-speed steel, due primarily to conditions arising from the railroad strike. Prices are unchanged at 75c. per lb. base, for 18 per cent tungsten high speed steel.

Coke.—Nothing new has developed. Shipments are coming through slowly, and foundries are running on the ragged edge. Prices are steadily advancing, and Wise County foundry coke is to-day quoted at $12, an advance of $2 over last week. Prices from other districts remain about the same.

Old Material.—The scarcity of pig iron has created an interest in cast scrap, and a number of inquiries for machinery cast are before the trade. Some fair sized sales are reported, and as a result this grade has been advanced $1 a ton. The market is softer, as a whole, owing to the fact the mills are out of the market, and quite a number of "distressed" shipments are being offered to dealers.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

Per Gross Ton

Bundled sheets	$8.00 to	$8.50
Iron rails	13.50 to	14.00
Relaying rails, 50 lb. and up	26.50 to	27.00
Rails for rerolling	13.50 to	14.00
Heavy melting steel	13.00 to	13.50
Steel rails for melting	13.00 to	13.50
Car wheels	14.50 to	15.00

Per Net Ton

No. 1 railroad wrought	11.50 to	12.00
Cast borings	9.00 to	9.50
Steel turnings	8.00 to	8.50
Railroad cast	14.00 to	14.50
No. 1 machinery	17.00 to	17.50
Burnt scrap	9.50 to	10.00
Iron axles	18.00 to	18.50
Locomotive tires (smooth inside)	11.00 to	11.50
Pipes and flues	6.50 to	7.00

St. Louis

ST. LOUIS, Aug. 8.

Pig Iron.—The market has advanced to $28, Chicago, for Northern iron, for spot delivery, and $26 for forward delivery, and is strong at that price. Southern iron has also advanced to $19.50 to $20, Birmingham, the Sheffield producer which had been quoting $18.50 having withdrawn from the market. The fact is there is no Southern iron to be had, the railroad strike having made it impossible to make shipments. Some Southern iron loaded on cars in June for St. Louis delivery is still in the South. This has added to an already serious situation, and iron is exceedingly scarce to get. Makers of Northern iron are well booked with orders, and their costs are steadily mounting on account of the advancing market for coke. The Granite City maker is still on a 100 per cent production basis, but is at present without any stocks of high silicon iron, for which there is a pressing demand. On account of the slow movement of freight, buyers are finding that they are obliged to make spot purchases to supply immediate needs. The situation does not permit of promising any relief, men in the trade say, and they look for higher prices to prevail. The principal transactions of the Granite City maker were the sales of 1000 tons of foundry iron to an East Side melter; 1000 tons of foundry iron to a southern Illinois foundry; 300 tons to a local melter; 100 tons to an Indiana concern and 100 tons to a Belleville melter. One Texas concern wants 500 to 1000 tons of foundry iron and another melter from that state is in the market for 300 tons, and there are numerous scattering inquiries for a carload up to 300 tons. Realizing conditions, users are scaling down their inquiries to cover immediate needs. There is an inquiry for 100 tons of spiegeleisen for prompt shipment. During the last two or three weeks there has been a good demand for ferromanganese, sales amounting to between 400 and 500 tons.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago and $5.17 from Birmingham and 81 cents average switching charge from Granite City:

Northern foundry, sil. 1.75 to 2.25 (forward delivery)	$28.16
Northern malleable, sil. 1.75 to 2.25 (forward delivery)	28.16
Basic (third quar.)	28.16
Southern foundry, all rail, sil. 1.75 to 2.25	$24.67 to 25.17

Finished Iron and Steel.—The coal strike continues to make it increasingly difficult to get material, and mills are disposed to turn down business because of this condition and an already large order file. Recently there has been a much better demand for plates for oil tanks. A Tulsa manufacturer bought 1000 tons of tank plates here during the week, and reported that the prospects were for a heavy demand for tanks. The Standard Oil Co. of Indiana is in the market for 25 70,000-gal. tanks, involving about 6000 tons. Railroad inquiries are limited to track material. For instance, the Wabash wants 240,000 tie plates, and 200 kegs of standard track bolts. There has been considerable buying of the latter lately. Other material wanted is such as to appeal only to a warehouse. Inquiries for structural steel in the district have amounted to about 400 tons in lots of 100 tons and less, the inquiries being confined to immediate needs. Galvanized sheets are in good demand, one local jobber buying 200 tons.

For stock out of warehouse we quote: Soft steel bars, 2.70c. per lb.; iron bars, 2.70c.; structural shapes, 2.80c.; tank plates, 2.80c.; No. 10 blue annealed sheets, 3.85c.; No. 28 black sheets, cold rolled, one pass, 4.45c.; cold drawn rounds, shafting and screw stock, 3.50c.; structural rivets, $3.35 per 100 lb.; boiler rivets, $3.45; tank rivets, ⅞ in. and smaller, 60 per cent off list; machine bolts, large, 50 and 10 per cent; small, 50-10 and 10 per cent; carriage bolts, large, 55-5 per cent; small, 60 and 10 per cent; lag screws, 60 per cent; hot pressed nuts, square or hexagon blank $3.50; and tapped $3.25 off list.

Coke.—The demand for coke both from industrial and domestic users is tremendous, with the sources of supply becoming fewer. The St. Louis by-product maker has been out of the market for some time, confining its business to the filling of contracts for gas plants, while the Granite City by-product maker has reduced its coke production to the lowest possible degree consistent with supplying municipalities depending upon them for gas. Granite City coke is being sold at $12 at the ovens, if they are able to ship it, but orders are being taken subject to delays and price prevailing on date of shipment. Railroad conditions hamper the delivery of Alabama coke into St. Louis, and there is no Connellsville coke to be had.

Old Material.—The market for old material is firm, the only change being in steel couplers and knuckles, which are 50 cents a ton higher. Dealers are holding firm, expecting to get better prices. Very little material is coming into this district, as the railroads are too busily engaged in other matters to give the time to gather up scrap. Rolling mill grades are quiet.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton

Old iron rails	$16.75 to	$17.25
Rails for rerolling	15.75 to	16.25
Steel rails, less than 3 ft.	16.25 to	16.75
Relaying rails, standard section	25.00 to	28.00
Cast iron car wheels	18.50 to	19.00
No. 1 heavy railroad melting steel	14.75 to	15.25
No. 1 heavy shoveling steel	14.00 to	14.50
Ordinary shoveling steel	13.75 to	14.25
Frogs, switches and guards, cut apart	15.25 to	15.75

Per Net Ton

Heavy axle and tire turnings	9.50 to	10.00
Steel angle bars	13.75 to	14.25
Iron car axles	23.50 to	24.00
Steel car axles	17.00 to	17.50
Wrought iron bars and transoms	19.00 to	19.50
No. 1 railroad wrought	13.50 to	14.00
No. 2 railroad wrought	13.00 to	13.50
Railroad springs	16.00 to	16.50
Steel couplers and knuckles	17.50 to	18.00
Cast iron borings	9.00 to	9.50
No. 1 busheling	11.75 to	12.25
No. 1 railroad cast	15.50 to	16.00
Stove plate and light cast	12.75 to	13.25
Railroad malleable	14.00 to	14.50
Pipes and flues	8.75 to	9.25
Machine shop turnings	9.25 to	9.75

Buffalo

BUFFALO, Aug. 8.

Pig Iron.—Only one Buffalo furnace has iron for sale and this only in limited quantities and all of low silicons. This interest has iron on hand but because of obligations it is not desirable to unload it all at this time, although the demand could easily exhaust the supply. The M. A. Hanna Co. has blown out one furnace and has one in blast. With the other interests the problem is one of trying to operate rather than trying to sell. On No. 2 plain $30 is easily obtainable, and on No. 2X, $31. A few scattered carloads were sold by a furnace which took the iron from the yard and obtained for it $30, $31 and $32 on these sales. The interest having iron for sale is making all its quotations subject to immediate acceptance. Inquiry generally has been rather light due in measure to the knowledge that Buffalo furnaces are unable to take business. The

majority of merchants feel that the present price base will not be changed for the remainder of the year; that even though the fuel situation were relieved, there would be little change in prices for at least ninety days.

We quote f.o.b. per gross ton Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sil.	$32.00
No. 2X foundry, 2.25 to 2.75 sil.	31.00
No. 2 plain, 1.75 to 2.25 sil.	30.00
Basic	25.00
Malleable	28.00
Lake Superior charcoal	31.78

Finished Iron and Steel.—Mills are being brought nearer each day toward a complete shutdown and none feels any easier than last week. There is some difference in just how much longer the mills will keep going, because there is no uniformity in the amount of fuel on hand. The branch of a large independent continues to take black sheet and bolt business. Inquiry is good. Sellers are hearing from customers not ordinarily on their regular calling lists. Particularly is this true of buyers seeking bars. There is plenty of small structural business and Buffalo fabricators have taken some desirable tonnages in operations involving more than 100 tons, as shown in another column. Tin plate demand from canners is especially heavy. A local branch of an independent being able to take as much of this business as comes its way. The same interest is able to take orders for cold finished material and finds the demand good. The price is 2.25c., Pittsburgh, on carload lots with deliveries usually three to four weeks.

Warehouse Business.—The problem is more to get material than it is to sell it. Demand is very good for all material but notwithstanding merchants do not expect any price advance. Considerable inquiry is coming from outside the normal radius covered by local warehouses, indicative of the seriousness of the situation elsewhere.

We quote warehouse prices, Buffalo, as follows: Structural shapes, 2.85c.; plates, 2.85c.; soft steel bars, 2.75c.; hoops, 3.55c.; bands, 3.40c.; blue annealed sheets, No. 10 gage, 3.80c.; galvanized steel sheets, No. 28 gage, 5.60c.; black sheets, No. 28, 4.60c.; cold rolled round shafting, 3.55c.

Old Material.—Dealers appear to feel easier. Confidence has been partly restored by a large railroad equipment manufacturer's coming into the market for heavy melting steel and paying, it is understood, $17 for a good grade. About 5000 tons has been purchased so far. Other consumers are buying less tonnages of heavy melting steel. Consumers who regularly buy mixed turnings and borings have stopped shipment, because of blast furnace curtailment. No. 1 machinery cast scrap is strong and there is also a lively demand for low phosphorus scrap.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel	$16.75 to $17.00
Low phos., 0.04 and under	18.00 to 19.00
No. 1 railroad wrought	16.00 to 16.50
Car wheels	17.00 to 18.00
Machine shop turnings	10.50 to 11.00
Cast iron borings	14.00 to 14.50
Heavy axle turnings	14.00 to 14.50
Grate bars	14.00 to 14.50
No. 1 busheling	15.00 to 15.50
Stove plate	15.00 to 15.50
Bundled sheet stampings	11.50 to 12.00
No. 1 machinery cast	18.50 to 19.50
Hydraulic compressed	15.00 to 15.50
Railroad malleable	17.00 to 17.50

Birmingham

BIRMINGHAM, Aug. 8.

Pig Iron.—At the close of the first week in August there was only one openly quoted price for Birmingham iron. That was $20. The largest foundry iron maker and two small makers were out of the market and those in the market made sales at $20. Largest of these sales at $20 was for 1000 tons for August and September delivery, part of the tonnage to go to a Southern plant and part to a Northern one of the same interest. One lot of prompt iron of small tonnage was sold for New York delivery at $20.50. One maker booked numerous small lots at $20 base during the week. No maker seemed inclined to shade this base. The market attitude was stronger than at any time since the recovery from the depression began to set in. One lot of 300 tons for fourth quarter sold at $22, which was base of $20 and 50 cents for each of two silicon grades above the 1.75 to 2.25 per cent base. From unofficial reports it seemed clear at the end of the month that stocks on yards had not increased over the low level of July 1 with 44,000 tons. It is doubtful if there was change one way or the other. At the close of July and the first week in August production was maintained at the high pace existing on July 1. Two more blast furnaces were in operation this week than during the same week in July. Proximity of raw materials and company ownership of railroad lines and rolling stock have enabled full production. The Tennessee company, in fact, is credited with a record coal production in July, the holiday considered. The Central Coal & Iron Co. is scheduled to resume at the furnace at Holt this week. Supply of raw material is at hand. The furnace has been repaired. Deliveries are another matter. They are very difficult. Some pig iron is being piled this month on account of the car shortage, which is the only trouble in the Birmingham district.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	$19.50 to $20.00
Basic	18.50 to 19.00
Charcoal, warm blast	30.00 to 32.00

Finishing Mills.—There has been no change in the finishing mill situation since July 1. The Tennessee company has steadily maintained this schedule: Double turn at plate, guide and bar mills at Bessemer, double turn at tie-plate and structural mills at Fairfield, double turn at rail and blooming mills at Ensley, 100 per cent capacity in the ingot mill and full turn at the car works. New high coal-producing records were made in July weeks. Nine blast furnaces were in operation this week, compared with seven July 1. The Gulf States Steel Co. and the American Steel and Wire Co. are on full turn in the finishing mills. Conners Steel Co. is on double turn at the Woodlawn mill and experiencing delays in shipment of cotton ties.

Cast Iron Pipe.—The National Cast Iron Pipe Co. has booked 500 tons for St. Paul and the United States Cast Iron Pipe & Foundry Co. booked the 1000 tons of 20-in. pipe let by Dallas. Some belated customers are reported to be paying $38 and $39 for pressure pipe, but the leading interest has not advanced beyond $37. The shops are on full turn and, incident to the car shortage, are piling some pipe. Sanitary shops are also on full turn except where slowing down on account of inability to ship and reluctance to accumulate exist. The base remains at $60 for standard pipe.

Coal and Coke.—Alabama mines, owing to the influx of cars from Western roads making extra purchases of coal, continue making the best production records in five years. Spot prices have gotten as high as $5, but $3 to $4 is the rule. Coke is very strong and the base is nearer $6 and $7 than the recent $5.50 to $6.

Old Material.—There has been a lull in the old material market owing to unwillingness of consumers to take on yards any more stock than meets current needs, while the car shortage works against shipments to distant points. Cast scrap is in fair demand on account of the steady local consumption in foundries, none of which have so far been forced to shut down on account of the rail strike. We quote per gross ton f.o.b. Birmingham district yards as follows:

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails	$13.00 to $15.00
No. 1 steel	12.00 to 14.00
No. 1 cast	15.00 to 16.00
Car wheels	14.00 to 15.00
Tramcar wheels	13.00 to 14.00
Stove plate	13.00 to 14.00
Cast iron borings	6.00 to 7.00
Machine shop turnings	4.00 to 5.00

More men are being added to the force at the works of the Ohio Steel Foundry Co. in Springfield and Lima, Ohio, as a result of the orders placed by the Lima Locomotive Works. The heavier castings will be made at the Lima works and the lighter ones at the Springfield works. Agricultural implement manufacturers are now booking fair-sized orders for the fall trade, according to announcements made by the heads of the local companies.

Boston

BOSTON, Aug. 8.

Pig Iron.—The increased demand for third and fourth quarter iron and larger sales of foreign iron are the features of the market. Inquiries aggregate 4000 to 5000 tons, being about equally divided between No. 2X and No. 1X, ranging from 500 tons down to carlots. Practically no Buffalo, Pennsylvania or Virginia iron is available, consequently activity centers in Alabama and foreign iron. A Providence, R. I., foundry has purchased 500 tons, silicon 2.25 to 2.75 per cent, Alabama iron at $30 base, dock that city, which with loading and other charges brings the delivered price to around $31. Smaller tonnages have sold at $30, Providence, dock base. In addition, fourth quarter Alabama iron sold at $19.50 to $20, furnace base. Sales of foreign iron in this territory the past week aggregate 5000 to 6000 tons, mostly Scotch, with silicons equal to our No. 2X and No. 1X. No. 3 Scotch iron sold at $27.50 to $29, c.i.f. dock Boston, making the average delivered price in Massachusetts $30 to $32. English pig irons are offered for third and fourth quarter shipment on the same basis, while French irons are slightly cheaper. The largest individual lot of foreign iron taken the past week was 1500 tons fourth quarter delivery, by a Connecticut melter. The sale of foreign iron in this market is handicapped by a lack of adequate storage facilities.

We quote delivered prices, on the basis of the latest reported sales, now infrequent, and as follows, having added to furnace prices $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75	$32.15 to $34.15
East. Penn., sil. 1.75 to 2.25	31.65 to 33.65
Buffalo, sil. 2.25 to 2.75	30.41 to 31.41
Buffalo, sil. 1.75 to 2.25	29.91 to 30.91
Alabama, sil. 2.25 to 2.75	29.60 to 30.10
Alabama, sil. 1.75 to 2.25	29.10 to 29.60

Coke.—The coal situation in this territory continues to tighten up. Both the New England Coal & Coke Co. and the Providence Gas Co. are on a $16.50 delivered basis for by-product foundry contract coke, but will accept no further business this month. One producer quotes $19.50 delivered for spot fuel, but no sales on that basis are reported. The other producer is reported to have accepted a limited tonnage of spot business at $16.50 ovens, the delivered price being considerably under $19.50. Both producers are seriously handicapped by inadequate coal supplies, and are unable to fulfill all requirements promptly. Demand for coke contracted for earlier is heavy, foundries being apprehensive of securing supplies this fall. A Providence, R. I., foundry wants 500 tons, shipments to begin in September. Crushed coke has advanced $2, to $14 on cars ovens.

Finished Material.—Approximately 500 tons of structural steel is being refigured for a seven-story office building for the Clapp Estate, Portland, Me. Other tonnages on the market are small. Moderately large tonnages of steel bars were placed last week at 2c., Pittsburgh base. Plate and structural prices also are firmer, but mills, especially northern, are not accepting much business except when no delivery specifications are in contracts.

Warehouse Business.—The recent advance in iron and steel prices served to stimulate rather than check the movement out of warehouses. Not only is more stock moving, but inquiries are freer and larger in individual cases. Sales of rivets have increased. Warehouse stocks remain unbalanced after months of readjustment, but in general are in fair condition. Brass wire, sheets, rods and tubing have advanced ½c. a pound and sheet zinc ¼c.

Jobbers quote: Soft steel bars, $2.75½ per 100 lb. base; flats, $3.40¼; concrete bars, $2.90 to $3.03; structural steel, $2.75½ to $2.90½; tire steel, $4.15 to $4.50; open-hearth spring steel, $4.50 to $6; crucible spring steel, $11.50; steel bands, $3.90; hoop steel, $4.40; cold rolled steel, $3.50 to $4; refined iron, $2.75½; best refined iron, $4.25; Wayne iron, $5.50; Norway iron, $6 to $6.50; plates, $2.85½ to $3.04; No. 10 blue annealed sheets, $3.90 per 100 lb. base; No. 28 black sheets, $4.90; No. 28 galvanized sheets, $5.90.

Old Material.—The old material market is quieter, the demand for borings and turnings, which has been the feature for several weeks having let up somewhat. Some business in strictly No. 1 borings and turnings was closed the past week at $9.25 shipping point, for a Pennsylvania mill account, and additional tonnages, including one of 200 tons, are pending. A Massachusetts nail manufacturer also has bought borings and turnings on a $10 delivered base, having a $1.40 average freight. Cast iron borings remain difficult to obtain. A sale of 100 tons at $12.35 shipping point is reported, and several offers of $12.25 are out, which are expected to close shortly. A few cars of horseshoes have been bought locally at $13.25. Heavy melting steel offers of $10.50 shipping point for eastern Pennsylvania delivery, and of $10.75 for Pittsburgh district delivery are out, but little material is available at those prices. Local dealers report heavy rejections of melting steel by Pennsylvania mills.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$19.00 to $20.00
No. 2 machinery cast	17.00 to 18.00
Stove plate	15.50 to 16.50
Railroad malleable	15.00 to 15.50
Street car wheels	18.00 to 19.00

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$11.00 to $11.50
No. 1 railroad wrought	11.50 to 12.00
No. 1 yard wrought	10.00 to 10.50
Wrought pipe (1 in. in diam., over 2 ft. long)	8.00 to 8.50
Machine shop turnings	9.00 to 9.50
Cast iron borings, rolling mill	9.50 to 10.00
Cast iron borings, chemical	12.00 to 12.50
Blast furnace borings and turnings	9.00 to 9.50
Forged scrap and bundled skeleton	8.00 to 8.50
Street car axles and shafting	14.50 to 15.00
Rails for rerolling	11.00 to 11.50

Cleveland

Production Rate Held with Difficulty—Costs and Prices Mounting

CLEVELAND, Aug. 8.—Further curtailment of blast furnace operations with several stacks having difficulty in keeping in operation, increasing costs in manufacturing iron and steel, and rapid advances in prices of iron and steel products for anything approaching early delivery characterized the market the past week. One independent steel company estimates that its coal is costing it at least $12 to $14 per ton for every ton of steel produced. Steel Corporation subsidiaries have not announced any advance in prices on shapes, plates and bars, but it is understood that not less than 1.80c. will be quoted.

On the eve of the reassembling of the meeting of coal operators and miners the prevailing belief is that most of the operators here will concede nearly everything demanded by the miners. The operators are divided concerning the policy to be pursued, and as one prominent man in the iron trade expressed it, it is a case of demoralization against organization, for the miners are standing firmly for their demands. Indications are that the railroads are making progress in improving service and will grant no concessions to the striking shopmen.

Iron Ore.—Cheering news comes from the head of the Lakes to the effect that railroads, particularly the Great Northern, which have been crippled by the shopmen's strike, are now operating much more satisfactorily, some of them at 85 per cent of the usual capacity, and ore is being loaded rapidly at upper Lake docks. At the lower Lake docks, however, although vessels are supposed to be in the first priority class with railroads, coal is being slowly received and some vessels have been tied up on account of inability to obtain fuel.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, $5.95; Old range non-Bessemer, 51½ per cent iron, $5.20; Mesabi Bessemer, 55 per cent iron, $5.70; Mesabi non-Bessemer, 51½ per cent iron, $5.05.

Pig Iron.—The active stack of the Cleveland Furnace Co. was banked last Friday, and Perry Furnace, Erie, Pa., has been ordered out and will probably be on the idle list Friday or Saturday of this week. Several other blast furnaces are barely able to keep in operation and the fuel situation shows no improvement.

Foundries have been following a hand to mouth policy in buying pig iron and as a result many of them have very little iron on hand. The announcement of the banking of the Cleveland stack has resulted in numerous melters trying to place orders and sales of No. 2 Foundry in limited quantities, have been made at $30. It is very doubtful whether less than this could be done. Many foundrymen are fairly well stocked with coke and are willing to pay high prices for iron, if necessary. No basic is being offered for sale in this city and very little foundry iron is obtainable.

A Cleveland melter has placed an order for a moderate tonnage of malleable to be shipped from St. Louis at $32, delivered, Cleveland. The demand for standard low phosphorus is active and prices have been advanced $2 to $3, quotations varying somewhat according to the analysis.

Quotations below are f.o.b. local furnace for Northern foundry iron, not including a 50c. switching charge. Other quotations except basic and low phosphorus are delivered Cleveland, being based on a $3.02 rate from Jackson and a $6 rate from Birmingham:

Basic, Valley furnace	$26.00
Northern No. 2 fdy., sil. 1.75 to 2.25	30.00
Southern fdy., sil. 1.75 to 2.25	24.50
Malleable	30.00
Ohio silvery, sil. 8 per cent	33.52
Standard low phos., Valley furnace	$35.00 to 36.00

Sheets.—The market is strong. Buying by automobile companies is more active. The usual quotation on automobile stock is 4.75c., but some mills are quoting 4.85c.

Warehouse Business.—Warehouses are enjoying good business and prices are unchanged.

Jobbers quote steel bars, 2.56c.; plates and structural shapes, 2.66c.; No. 9 galvanized wire, 3c.; No. 9 annealed wire, 2.50c.; No. 28 black sheets, 4c.; No. 28 galvanized sheets, 5c.; No. 10 blue annealed sheets, 3.50c. to 3.61c.; hoops and bands, 3.21c.; cold-rolled rounds, 3.30c.; flats, squares and hexagons, 3.80c.

Semi-Finished Steel.—The nominal price of $35 is quoted on sheet bars, billets and slabs, but there is none for sale by any Cleveland producer, and, if any should be offered for sale, it would be at not less than $40.

Bolts, Nuts and Rivets.—Business is very active. Railroads continue to be among the important buyers. The strike of shop men does not seem to have affected the buying at all and so far has caused little trouble of any kind. While there is some delay in the receipt of steel, manufacturers are not suffering and they are able to make fairly satisfactory delivery on their products. Complaint is made that some of the coal being received is extremely poor.

Old Material.—Owing to strike conditions, buyers are placing no orders and there are no transactions between dealers. Prices are to a large extent nominal.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel	$14.75 to $15.00
Steel rails, under 3 ft	15.25 to 15.50
Rails for rolling	15.75 to 16.25
Iron rails	14.00 to 15.00
Iron car axles	18.00 to 19.00
Low phosphorus melting	16.00 to 16.25
Cast borings	12.00 to 12.25
Machine shop turnings	11.50 to 12.00
Mixed borings and short turnings	11.75 to 12.00
Compressed steel	12.85 to 13.25
Railroad wrought	14.00 to 14.50
Railroad malleable	15.50 to 16.00
Light bundled sheet stampings	10.00 to 10.25
Steel axle turnings	13.00 to 13.50
No. 1 cast	17.00 to 17.50
No. 1 busheling	10.25 to 10.50
Drop forge flashings over 10 in	10.25 to 10.50
Drop forge flashings under 10 in	10.00 to 10.50
Railroad grate bars	13.75 to 14.25
Stove plate	13.75 to 14.25
Pipes and flues	10.00 to 11.00

Finished Iron and Steel.—Prices of bars and plates are moving upward rapidly. On bars for prompt delivery sales have been made as high as 2.75c. Fully 20,000 tons of forging bars offered mills has been turned down on account of inability to make deliveries. The Carnegie Steel Co. will furnish 10,000 tons of plates and shapes for the two new passenger boats, the largest on the Lakes, to be built by 1924, for the Detroit & Cleveland Navigation Co. by the American Shipbuilding Co., and also 4600 tons for a new freighter for Pickands, Mather & Co. Inquiries for tank plate from the Sharon field amounting to 6300 to 6500 tons have been received. Independent companies in this district are now quoting 2.25c. on plates and as high as 2.50c. has been paid on small lots for prompt delivery. Quotations on cold-rolled steel bars have been advanced to 2.25c. and a further advance to 2.50c. is predicted. The McClintic-Marshall Co. has booked 500 tons of reinforcing ribs for the Scotia-Schenectady Bridge, Schenectady, N. Y. The order for the steel for the addition to the Lima Locomotive Works, 2000 tons, has not been placed on account of uncertainty as to delivery. October delivery is desired.

Pittsburgh Iron and Steel Market

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getting many responses. Another steel company in this district, anxious to get some really good steel, bid $18.50 delivered for some railroad scrap and failed to secure any. Steel offered in the list of the Pennsylvania Railroad, central region, brought $18.25, Pittsburgh, and the knuckles and couples for both this division and the Eastern region went to dealers around $19 per gross ton, delivered Pittsburgh. The steel foundries are paying higher prices for billet and bloom crops and a large user of machine shop turnings lately has re-entered the market and is offering a slight advance over recent prices.

Principal users of compressed sheets in this district lately have been out of the market, and while some of the offerings by local mills and producers have sold as high as $16.50, delivered, Pittsburgh, $16 appears to be as high as any consumers now will go.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows per gross ton:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh	$17.50
No. 1 cast, cupola size	$19.00 to 19.50
Rails for rerolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	17.50 to 18.00
Compressed sheet steel	16.00 to 16.50
Bundled sheets, sides and ends	15.00 to 15.50
Railroad knuckles and couplers	19.00 to 19.50
Railroad coil and leaf springs	19.00 to 19.50
Low phosphorus standard bloom and billet ends	21.00 to 22.00
Low phosphorus plates and other grades	19.00 to 20.00
Railroad malleable	16.50 to 17.00
Iron car axles	26.00 to 26.50
Locomotive axles, steel	25.00 to 25.50
Steel car axles	17.50 to 18.00
Cast iron wheels	18.00 to 18.50
Rolled steel wheels	19.00 to 19.50
Machine shop turnings	14.00 to 14.25
Sheet bar crop ends	19.00 to 19.50
Heavy steel axle turnings	15.00 to 15.50
Short shoveling turnings	15.00 to 15.50
Heavy breakable cast	18.00 to 18.50
Stove plate	14.50 to 15.00
Cast iron borings	15.50 to 16.00
No. 1 railroad wrought	15.00 to 15.50

Consolidation of McKune, Danforth and Egler Blow Torch Systems

PITTSBURGH, Aug. 8.—The announcement of the consolidation of all patents and patent applications relating to combustion in regenerative furnaces, known as the McKune, Danforth and Egler systems, is just announced. The Miami Metals Co., Blair Engineering Co. and Arthur G. McKee & Co. have assigned all patents and applications held by them in connection with the blow-torch process to the Union Trust Co., Cleveland, which as trustee for the open-hearth combustion system, is empowered to grant licenses under these patents. This consolidation will assure to the steel industry the best that has been developed under all of these basic patents combined in one design, and will also remove the possibility of any patent interference in the use of these equipments and methods of operation. The Blaw-Knox Co., Pittsburgh, has been appointed agent for the exclusive sale and manufacture of all of the equipment covered by these patents. It has organized a special engineering and service department, composed of experts in open-hearth design and operation, who will devote their time to the development and sale of these devices.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Plates

Sheared, tank quality, base, per lb.....1.70c. to 1.85c.

Structural Material

Beams, channels, etc.....1.70c. to 1.85c.

Iron and Steel Bars

Soft steel bars, base, per lb.....1.70c. to 1.85c.
Refined iron bars, base, per lb.....2.25c.

Hot-Rolled Flats

Hoops, base, per lb. .....2.50c. to 2.75c.
Bands, base, per lb. .....2.50c. to 2.75c.
Strips, base, per lb. .....2.50c. to 2.75c.
Cotton ties, per bundle of 45 lb.....$1.11

Cold-Finished Steels

Bars and shafting, base, per lb.....2.25c.
Strips, base, per lb. .....4.00c.

Wire Products

Nails, base, per keg	$2.40
Bright plain wire, base, per 100 lb.	2.25
Annealed fence wire, base, per 100 lb.	2.25
Galvanized wire, base, per 100 lb.	2.75
Galvanized barbed, base, per 100 lb.	3.05 to 3.15
Galvanized staples, base, per keg	3.05 to 3.15
Painted barbed wire, base, per 100 lb.	2.55 to 2.65
Polished staples, base, per keg	2.55 to 2.65
Cement coated nails, base, per count keg	1.90 to 2.00

Woven fence, carloads.....73 per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads, 60, 10 and 10 per cent off list
Machine bolts, small, cut threads....60 and 10 per cent off list
Machine bolts, larger and longer.....60 and 10 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads.60 and 10 per cent off list
Cut threads .....60 per cent off list
Longer and larger sizes .....60 per cent off list
Lag bolts .....60, 10 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.:
Smaller and shorter.....50 and 10 per cent off list
Larger and longer sizes .....50 and 10 per cent off list
Hot pressed square or hex. blank nuts .....$4.50 off list
Hot pressed nuts, tapped .....$4.50 off list
C.p.c. and t. sq. or hex. nuts, blank .....$4.50 off list
C.p.c. and t. sq. or hex. nuts, tapped .....$4.50 off list
Semi-finished hex. nuts:
9/16 in. and smaller, U. S. S.....80 and 10 per cent off list
⅝ in. and larger, U. S. S...75 and 10 per cent off list
Small sizes, S. A. E. .....80, 10 and 10 per cent off list
S. A. E. ⅝ in. and larger..75 and 10 per cent off list
Stove bolts in packages .....80 and 5 per cent off list
Stove bolts in bulk .....80, 5 and 2½ per cent off list
Tire bolts .....65 per cent off list
Track bolts in carloads.....3.25c. to 3.50c. base
Track bolts, less than 200 kegs.....4.25c. to 4.50c. base

Cap and Set Screws

Milled square and hex. head cap screws, 75 and 10 per cent off list
Milled set screws.....75 per cent off list
Upset cap screws .....80 per cent off list
Upset set screws .....80 and 5 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb.....$2.65
Large boiler rivets, base, per 100 lb.....2.75
Small rivets .....70 to 70 and 5 per cent off list

Track Equipment

Spikes, ⅝ in. and larger, base, per 100 lb.....	$2.35 to $2.50
Spikes, ½ in. and smaller, base, per 100 lb.....	2.75 to 3.00
Spikes, boat and barge, base, per 100 lb.....	2.75 to 3.00
Track bolts, base, per 100 lb.....	3.25 to 3.50
Tie plates, per 100 lb.	2.00 to 2.25
Angle bars, base, per 100 lb.	2.40

Welded Pipe

Butt Weld

Steel Inches	Black	Galv.	*Iron* Inches	Black	Galv.
⅛	54½	28	⅛ to ⅜.....	+ 3½	+22½
¼ to ⅜.....	60	33½	½	36½	18½
½	65	50½	¾	42½	27½
¾	69	56½	1 to 1½.....	44½	29½
1 to 3.....	71	58½			

Lap Weld

2	64	51½	2	39½	25½
2½ to 6.....	68	55½	2½ to 6.....	42½	29½
7 to 8.....	65	51½	7 to 12.....	40½	27½
9 to 12.....	64	50½			

Butt Weld, extra strong, plain ends

⅛	50½	33	¼ to ⅜.....	+ 4½	+37½
¼ to ⅜.....	56	38½	½	35½	23½
½	62	50½	¾	42½	28½
¾	67	55½	1 to 1½.....	44½	30½
1 to 1½.....	69	57½			
2 to 3.....	70	58½			

Lap Weld, extra strong, plain ends

2	62	50½	2	40½	27½
2½ to 4.....	66	54½	2½ to 4.....	43½	31½
4½ to 6.....	65	53½	4½ to 6.....	42½	30½
7 to 8.....	61	47½	7 to 8.....	35½	23½
9 to 12.....	55	41½	9 to 12	30½	18½

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 and 2½ per cent.

Boiler Tubes

Lap Welded Steel		*Charcoal Iron*	
1¾ in.	26½	1½ in.	5
2 to 2¼ in.....	41	1¾ to 1⅞ in.....	15
2½ to 3 in.....	52	2 to 2¼ in.....	25
3¼ to 13 in.....	57	2½ to 3 in.....	30
		3¼ to 4½ in.....	32

To large buyers of steel tubes a supplementary discount of 5 per cent is allowed.

Standard Commercial Seamless Boiler Tubes

Discounts on cold-drawn or hot-rolled tubes in carload lots, f.o.b. Pittsburgh, follow:

1 in.	60	2½ and 2¾ in.....	43
1¼ and 1½ in.....	52	3 in.	47
1¾ in.	36	3½ to 4 in.....	52
2 and 2¼ in.....	39	4½ in. to 5 in.....	44

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Tin Plate

Standard cokes, per base box.....$4.75

Terne Plate

(Per package, 200-lb.)

8-lb. coating	$9.30	25-lb. coating I. C.....$14.25	
8-lb. coating I. C.....	9.60	30-lb. coating I. C.....	15.25
15-lb. coating I. C.....	11.80	35-lb. coating I. C.....	16.25
20-lb. coating I. C.....	13.00	40-lb. coating I. C.....	17.25

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....2.40c. to 2.60c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.15c. to 3.40c.

Galvanized

No. 28 (base), per lb.....4.15c. to 4.40c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.15c. to 3.40c.

Manufacturers have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic.	$0.325	Buffalo	$0.265	St. Louis	$0.43
Philadelphia, export...	0.265	Cleveland	0.215	Kansas City	0.735
Baltimore, domestic...	0.315	Cleveland, Youngstown		Kansas City (pipe)...	0.705
Baltimore, export.....	0.255	Comb.	0.19	St. Paul	0.595
New York, domestic...	0.34	Detroit	0.295	Omaha	0.735
New York, export.....	0.285	Cincinnati	0.295	Omaha (pipe)	0.705
Boston, domestic	0.365	Indianapolis	0.31	Denver	1.275
Boston, export	0.285	Chicago	0.34	Denver (pipe)	1.215

Pacific Coast $1.50	
Pac. Coast, ship plates	1.20
Birmingham	0.69
Memphis	0.385
Jacksonville, all rail..	0.50
Jacksonville, rail and water	0.415
New Orleans 0.515	

The minimum carload to most of the foregoing points is 36, 000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha, and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 30c. to 40c.; ship plates, 30c. to 40c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 30c. to 40c.; sheets and tin plates, 50c.; rods, wire rope, cable and strands, 75c.; wire fencing, netting and stretcher, 50c.; pipe, not over 8 in. in diameter, 50c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

EXPORT SITUATION DULL

Japan Inactive—United States to Supply Rails for Bolivia—Importers of Foreign Iron Active

NEW YORK, Aug. 8.—Export trade shows but slight change for the better. Japan continues dull and inactive with the exception of a few small inquiries. One export house in New York has received an order from the Hanshin Electric Express Railway for five miles of 75-lb. rails. There is an inquiry in the market for 400 tons of reinforcing bars, and one Japanese house is handling a tender calling for 1300 tons of bridge material. Black sheet buying is at a low ebb, and it is believed by some exporters that what few sheets are now being purchased in Japan are being obtained in England. The Chinese market continues dull. The 5000 tons of grooved rails, which was included in the inquiry issued several months ago by the Pekin tramways, has been awarded to a French mill. What few orders are appearing from South America are small.

The rail tonnage which will be purchased by the Ulen Contracting Co., 120 Broadway, New York, which is executing a railroad construction contract in Bolivia with the government, amounts to 5000 tons of 60-lb. rails with accessories (splice bars, bolts, nuts and spikes). The line, which is to be built from Atoche to Villazon, is 204 kilometers in length and the rail tonnage will probably total 12,000 to 13,000 tons. As a result of new financing by the Bolivian Government, an effort is being made to complete the railroad considerably within the five-year limit originally intended and the Ulen Contracting Co. hopes to lay 75 kilometers before the end of this year. An additional contract for a shorter line between Potosi and Sucre, Bolivia, will probably be let within the next month. In obtaining quotations on the present tender for 5000 tons of rails, bids were received from Britain and Continental countries as well as the United States, but in all probability the contract will be awarded to an American mill, for while the European prices were in some instances lower, in one case $44 per ton, c.i.f. port, deliveries were generally from four to six months or longer; the American bid on the other hand, was for delivery of 2500 tons by Sept. 1 and the remaining 2500 tons by Sept. 15.

Importing of foreign pig iron continues, but imports are largely confined to Scotch iron, 2 to 2.50 per cent sil. and low in phosphorus. One importer of foreign iron and steel reports that he has cabled for prices, delivered, on 5000 tons of Scotch iron for one consumer and another exporter and importer has cabled inquiries to United Kingdom connections in the past ten days for 1000 tons of Scotch iron. The latter has received three orders on this iron for early delivery, each of 100 tons; from foundries in Poughkeepsie, N. Y., Framingham, Mass., and Boston. Foundries are in many cases evidently insuring themselves a supply of pig iron during the present strike situation, by ordering small tonnages of foreign iron, which in a majority of instances is evidently Scotch iron.

Automatic heat treatment of pipe being manufactured by the centrifugal casting method by the United States Cast Iron Pipe & Foundry Co., has been satisfactorily tested out, according to information received from F. J. Ryan, president F. J. Ryan & Co., Philadelphia, who furnished the equipment.

The bran cleaning department building at the Shenango plant of the American Sheet & Tin Plate Co., New Castle, Pa., was destroyed by fire on Aug. 6, with a loss of $5.000. Firemen checked the fire from spreading to other departments.

Pilling & Co. announce that on Aug. 15 their New York offices for the sale of pig iron, ore, coal and coke will be removed from 2 Rector Street to larger quarters in suite 2252-53 Equitable Building, 120 Broadway.

JULY STEEL OUTPUT

Ingot Production Rate About 35,360,000 Tons Per Year—Daily Output 2100 Tons Less Than in June

According to the steel ingot statistics, as collected by the American Iron and Steel Institute, the 30 companies, which in 1921 made 87.50 per cent of the total, had an output in July of 2,487,104 gross tons. This compares with 2,634,477 tons in June and is a decline of 147,373 tons.

On the assumption that companies reporting are supplying the same percentage of the total as they did last year (though the percentage may be less) the output for the 25 working days of July was about 2,842,400 tons, or approximately 113,700 tons per day. The June production on the same basis was about 3,010,000 tons, or 115,800 tons per day. The July output was at the rate of about 35,360,000 tons per year; in June it was about 36,000,000 tons per year.

The statistics of the American Iron & Steel Institute since January, 1921, follow:

Months	Open-Hearth	Bessemer	All Other	Total
January, 1921	1,591,281	608,276	3,629	2,203,186
February	1,295,863	450,818	2,796	1,749,477
March	1,175,591	392,983	2,404	1,570,978
April	1,000,053	211,755	2,150	1,213,958
May	1,047,810	216,497	1,543	1,265,850
June	808,286	193,644	1,476	1,003,406
Total 6 months.	6,918,884	2,073,973	13,998	9,006,855
July	689,489	113,312	575	803,376
August	915,334	221,116	1,621	1,138,071
September	908,381	265,152	1,207	1,174,740
October	1,269,945	345,837	1,028	1,616,810
November	1,294,371	363,912	1,718	1,660,001
December	1,129,174	296,380	1,539	1,427,093
Total whole yr.	13,125,578	3,679,682	21,686	16,826,946
January, 1922	1,260,809	331,851	822	1,593,482
February	1,395,835	348,571	616	1,745,022
March	1,918,570	451,386	795	2,370,751
April	1,997,465	445,939	1,109	2,444,513
May	2,214,774	494,893	1,474	2,711,141
June	2,143,708	487,851	2,918	2,634,477
Total 6 months.	10,931,161	2,560,491	7,734	13,499,386
July	2,020,572	464,047	2,485	2,487,104

The July daily estimated output of 113,700 tons compares with 70,019 tons per day in January and 114,717 tons per day in May. April ranks next lowest to July at 111,710 tons per day.

Reduction in Alabama Iron Stocks

BIRMINGHAM, Aug. 8.—Yard stocks went down 8000 tons. The stocks on furnace yards in Alabama on Aug. 1 and July 1 were as follows: Foundry, 25,000 and 28,000 tons; machine cast, 1000 and 3000 tons; warrants, 2000 and 2600 tons; basic, 8000 and 10,000 tons; totals, 36,000 and 44,000 tons. Stocks on yards at this time last year were 216,000 tons.

The Cities Service Co. has approved plans involving an expenditure of several millions of dollars on the properties of the Ohio Public Service Co. The plans approved call for the construction of a 60-mile steel tower electric power transmission line from Lorain to Mansfield, and a similar line, 55 miles long, for Warren, Alliance and Canton. The company is also contemplating the installation of a 20,000-kw. turbine at its power plant in Lorain, Ohio, and a 30,000-kw. turbine in the Toledo Edison plant at Toledo.

The Pennsylvania Railroad has announced that its shops at Mt. Vernon, Ohio, will not be opened again and that the work formerly done at Mt. Vernon will be transferred to Columbus. The reason given is that work can be done more economically at Columbus.

NON-FERROUS METALS

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
Aug.	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
2	14.12½	13.75	32.25	5.80	5.50	6.60	6.25
3	14.12½	13.75	32.12½	5.80	5.50	6.65	6.30
4	14.12½	13.75	32.50	5.85	5.50	6.65	6.30
5	14.12½	13.75	....	5.85	5.50	6.65	6.30
7	14.12½	13.75	32.50	5.85	5.50	6.65	6.30
8	14.12½	13.75	32.62½	5.85	5.50	6.65	6.30

*Refinery quotation.

New York

NEW YORK, Aug. 8.

The markets are all strong but only moderately active. Domestic buying of copper is fair with prices strong. The tin market is exceedingly quiet but steady. Demand for lead is very heavy and prices are advancing. Sales of zinc continue in moderate volume at slightly higher levels.

Copper.—Domestic buying of electrolytic copper continues in moderate steady volume, but demand is not heavy nor speculative. The minimum price for August-September and 60-day delivery is 14c., delivered, or 13.75c., refinery, with some producers quoting nothing less than ⅛c. above these levels. There is still a very good demand from foreign consumers. Lake copper is quoted at 14.12½c., delivered.

Tin.—Light sales of Straits tin in a very quiet market have prevailed during the last week. On Thursday, Aug. 3, a moderate business was done in shipments from the East at around 32.12½c., the total approximating 150 tons. The uncertainty as to the labor situation is keeping large consumers out of the market. Yesterday and to-day have also been very quiet, partly because of the bank holiday in London yesterday. It is estimated that August shipments from the East will total about 7000 tons. Spot Straits to-day is quoted at 32.62½c, New York. Quotations in London to-day are as follows: £161 12s. 6d. for both spot and future standard and £162 7s. 6d. for spot Straits, or about £1 per ton below quotations a week ago, with the market still strong. Arrivals thus far this month here have been 1130 tons, with 5145 tons reported afloat.

Lead.—Large sales for August and 30-day shipment are reported and the market is firm at hardening prices. The quotations of the leading interest are unchanged at 5.55c., St. Louis, or 5.75c., New York, but in the outside market prices are higher at 5.85c., New York. In the West, however, the metal can be bought from independents at 5.50c., St. Louis. A good general inquiry is reported.

Zinc.—The advance in prime Western, which has continued almost daily for several weeks, apparently came to a temporary standstill last week at 6.30c., St. Louis, or 6.65c., New York, where it has remained for several days. Fundamental conditions are unchanged and demand is reported as good from both galvanizers and brass makers. The only alteration of interest is a slight easing in futures, which are now quoted about five points below August and September delivery, or 6.25c., St. Louis, and 6.60c., New York, due possibly to the expectation of an early settlement of the coal strike and a larger production of zinc ore.

Antimony.—Wholesale lots for early delivery are quoted unchanged in a quiet market at 5.25c. per lb., duty paid, New York.

Aluminum.—For virgin metal, 98 to 99 per cent pure, the leading interest continues to quote at 19.10c. per lb. f.o.b. plant, in wholesale lots for early delivery, and imported metal of the same analysis is offered by dealers at 17.75c. to 18c. per lb., New York, duty paid.

Old Metals.—The market is strong and was quite active the past week. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	13.50
Copper, heavy and wire	12.75
Copper, light and bottoms	11.25
Heavy machine composition	10.50
Brass, heavy	8.25
Brass, light	6.50
No. 1 red brass or composition turnings	8.75
No. 1 yellow rod brass turnings	7.50
Lead, heavy	5.00
Lead, tea	4.00
Zinc	3.75

Chicago

Aug. 8.—On the whole the market is quiet and marking time pending a settlement of the coal and rail strikes. There is some hand-to-mouth buying of lead, copper and zinc, but users are afraid to purchase futures. Some melters who are short of coal are said to have sold surplus stocks of metals. Lead and zinc have advanced slightly, while the other metals remain unchanged. Among the old metal grades only copper bottoms and zinc have advanced. We quote, in carload lots, lake copper, 14.25c.; tin, 33.50c. to 34c.; lead, 5.60c.; spelter, 6.40c.; antimony, 7c.; in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 10.75c.; copper bottoms, 9.25c.; red brass, 8.75c.; yellow brass, 6.75c.; lead pipe, 4.50c.; zinc, 3.50c.; pewter, No. 1, 20c.; tin foil, 22.50c.; block tin, 26c., all buying prices for less than carload lots.

St. Louis

AUG. 8.—The lead market is strong and 10 to 15 points higher for the week, while slab zinc is very strong, at an advance of 20 points for the week. We quote carlots: lead 5.50c. to 5.60c.; slab zinc, 6.30c. On old metals we quote: light brass, 3.50c.; heavy red brass and light copper, 4c.; heavy copper and copper wire, 7.50c.; zinc, 2c.; lead, 3c.; pewter, 15c.; tin foil, 16c.; tea lead, 2c.; aluminum, 9c.

Iron and Steel Institute Meeting at York

Announcement is made by the secretary, G. C. Lloyd, of the autumn meeting of the Iron and Steel Institute, which will be held at York, England, Sept. 5 and 6. On Thursday, Sept. 7 the members will visit the Devonshire Works of the Staveley Coal & Iron Co., Ltd., near Chesterfield, and on Friday the works of Parkgate Iron & Steel Co., Ltd. On Tuesday, following the afternoon session of the institute, the members are invited by William McConway, Pittsburgh, to attend a film demonstration at the Theatre Royal, York, of the new McConway process for the production of steel discs by the centrifugal hydraulic method direct from molten steel.

The following papers are announced:

"The Changes of Volume of Steels During Heat Treatment" (1. Air Hardening Nickel Chromium Steels), by L. Aitchison.

"Nitrogenization of Iron and Steel by Sodium Nitrate," by L. E. Benson.

"A Brinell Machine Attachment for Use with Small Specimens," by E. D. Campbell.

"A Preliminary Magnetic Study of Some Heat-treated Carbon Steels," by E. D. Campbell and Mr. Johnson.

"Some Experiments on the Flow of Steels, at a Low Red Heat, with a Note on the Scaling of Heated Steels," by J. H. S. Dickenson.

"An Investigation on the Factors Influencing the Grain and Bond in Molding Sands," by C. W. H. Holmes.

"Practical Notes on the Manufacture and Treatment of High-speed Steel," by H. K. Ogilvie.

"The Bases of Modern Blast Furnace Practice," by A. K. Reese.

"Reversing Cogging Mills: Their Drives and Auxiliary Equipment," by G. A. V. Russell.

"The Diminution of Lag at Ar 1 Through Deformation," by J. H. Whiteley.

PERSONAL

Arthur Whitcraft, manager manganese steel sales of the Hadfield-Penfield Steel Co., in addition to his previous duties, has been placed in charge of all foundry operations at the South Works at Bucyrus, Ohio.

Wm. H. Lolley, special representative for the Standard Parts Co., sailed for Europe Aug. 1. He will make negotiations with German and French interests for the manufacture and sales promotion of Bock taper roller bearings on the Continent, and will visit the British Bock Bearings, Ltd.

William Ochse, whose appointment as efficiency engineer of the Ohio Machine Tool Co., Kenton, Ohio, was announced in this column a few months ago, has been promoted to works manager.

F. D. Gordon has been appointed manager of the Gary Screw & Bolt Co. works, Gary, Ind., succeeding C. E. Carr, who had been manager for a number of years.

L. H. Williard, for the past two years representative of the Carnegie Steel Co. in Washington on armor plate matters, has been transferred to the general offices of the company in Pittsburgh.

A. C. Acker, formerly electrical engineer at the Shaw works, Manning, Maxwell & Moore, Inc., Muskegon, Mich., has been appointed sales engineer and will work out of the Pittsburgh office of that company.

E. W. Reitzel, treasurer MacWhyte Co., Kenosha, Wis., manufacturer of wire rope, cable, etc., has resigned to engage in other business at Chicago. H. G. Sawyer, Oak Park, Ill., has been elected treasurer in his stead.

Lewis J. Whitney, treasurer Osgood-Bradley Car Co., Worcester, Mass., since 1920, has resigned to accept a position with the Perkins Oil Well Cementing Co., Los Angeles. He became associated with the Worcester company in 1909.

Col. Lindley D. Hubbell, vice-president and in charge of operations of the Hendee Mfg. Co., Springfield, Mass., maker of motorcycles, has retired owing to ill health. He is succeeded by Frank J. Weschler.

Harry W. Hultgren, sales and traffic manager Skinner Chuck Co., New Britain, Conn., has resigned. He was associated with the company twelve years. He has made no plans for the immediate future.

Herbert H. Wheeler, secretary Union Mfg. Co., New Britain, Conn., maker of chucks, iron castings, etc., has returned from a three months' European business trip.

Col. Elmer H. Havens, formerly president and one of the Federal receivers of the Locomobile Co. of America, Bridgeport, Conn., has been chosen vice-president and general manager of the Locomobile Corporation of America, recently formed by W. C. Durant, who has purchased the business.

J. A. McCrory, formerly secretary and general manager of sales of the American Steel Co., Pittsburgh, and C. T. Baird, who was president of Charles T. Baird & Co., have formed a partnership under the firm name Baird & McCrory, Inc., with offices at 140 Nassau Street, New York.

A. H. Hudson, at one time associated with the late Edward Hagar when president of the Universal Portland Cement Co., and later in charge of purchasing for the American International Steel Corporation when Mr. Hagar was president of that organization, and who resigned in 1919 to go into business in Chicago, is now representing, with headquarters in New York, the Service Motor Truck Co., Wabash, Ind., manufacturer of a self-contained railroad passenger car employing a gasoline engine.

George M. Gillette has resigned as president of the Minneapolis Steel & Machinery Co., Minneapolis, after an official connection extending over 20 years. For 12 years prior to that time he was secretary of the Gillette-Herzog Mfg. Co. Mr. Gillette was a member of the commission appointed by the governor of Minnesota which spent four years in studying workmen's compensation in the United States and Europe, and he had much to do with framing the compensation act now in force in Minnesota. His successor as president of the Minneapolis Steel & Machinery Co. is yet to be chosen. Mr. Gillette remains a member of the executive committee and the board of directors.

I. H. Bragg, formerly manager of the Portland, Ore., warehouse of Waterhouse & Lester Co., is now associated with the Inland Iron Co., Fresno, Cal.

Irving S. Kemp, formerly sales manager of the Vaughan & Bushnell Mfg. Co., Chicago, has become vice-president of the Evansville Tool Works, Evansville, Ind.

J. Leonard Replogle returned to New York from a European trip, Aug. 5.

Richard Sanderson, vice-president Standard Steel Works Co., Philadelphia, underwent a serious operation this week at a hospital in Camden, N. J.

E. G. Grace, president Bethlehem Steel Co., has returned from Europe.

William P. Woodside, Studebaker Corporation, Detroit, Mich.; Wells K. Gregg, Milwaukee, and Earnshaw Cook, Towson, Md., have been proposed for membership in the Iron and Steel Institute, and their names are on the voting list for the autumn meeting, which will be held at York, England.

Don. H. Gordon, who has been in charge of the Cincinnati office of the Brier Hill Steel Co., as district manager of sales, has resigned his position to accept an executive position with the Niles Steel Products Co., Niles, Ohio. W. F. Rummell will have charge of the Cincinnati office, working out of the Cleveland office.

William A. Schuyler has resigned as president and general manager of the Scintilla Magneto Co., Inc., which is controlled by Brown, Boveri & Co., of Baden, Switzerland. He was formerly associated with the late Edouard Nieuport, the inventor of the Nieuport airplane, and he represented the Nieuport interests in the United States. Later he introduced the Simms magneto to the American market. Soon after the beginning of the world war he spent considerable time in Russia as the representative of American made motor vehicles and machinery, and later was European sales representative of the General Motors Export Corporation. When the United States was at war he was with the bureau of aircraft production. He plans to make an extended trip to Europe.

James T. Waite, for the past ten years New England sales engineer for the Whitman & Barnes Mfg. Co., assumed management of sales for the New Process Twist Drill Co., Taunton, Mass., on July 1.

George F. Davie, vice-president and treasurer Interstate Iron & Steel Co., Chicago, accompanied by Mrs. Davie, sailed on the Montcalm from Montreal, July 28, for Liverpool. They will visit the British Isles, Belgium, Germany, Switzerland, Italy and France and will return late in September.

Charles C. Hill, general superintendent Schoenberger Works, American Steel & Wire Co., Pittsburgh, for the past nine months, and whose connection with that plant goes back 30 years, has been appointed general superintendent of the Newburg Steel Works of the same company, Cleveland, succeeding B. D. Quarrie, who resigned recently to go with Otis Steel Co., Cleveland. Mr. Hill's first connection with the steel industry was as a clerk at the old Twenty-sixth Street works in Pittsburgh, and since he has successively been chief timekeeper, chief clerk, night and day superintendent of the Bessemer department, and assistant general superintendent, which position he held for about nine months before being made general superintendent. Mr. Hill's successor at Schoenberger works has not yet been named.

FRENCH EXPORTS DECLINE

Lower German and British Exchange Curtails French Sales—Domestic Market Dull Except for Sheets

(*Special Correspondence*)

PARIS, FRANCE, July 27.—With the exception of sheets the iron and steel market is dull. The fall of the German mark to 0.0235 fr. has strengthened the position of Germany in export markets to the detriment of French exports, which were also unfavorably influenced by the recession of the pound sterling to 53 fr. after having touched 58 fr.

Germany delivered to France, in June, 374,646 metric tons of coke on the reparations account. But France, whose own production of coke is only about 80,000 tons per month, imported in June 52,942 tons from Belgium and 5181 tons from Great Britain.

As French pig iron producers do not wish to increase the production of pig iron at present, these coke supplies, supplemented by some coking slack coal from Germany, were sufficient to meet the needs of the blast furnaces. But the situation might be quite different with a greater number of blast furnaces in operation.

Iron Ore.—The iron ore market is slowly improving and the following prices have been paid lately:

	Francs
Siliceous ore, Longwy	9.50 to 14.50
Minette, Briey	14.00 to 15.00
Minette, Thionville, 32 per cent	11.50

Negotiations have been opened with British blast furnaces and coal mines for an exchange, via northern French ports, of iron ore from Briey for British coke and coal for French iron works and railroads and other public utilities.

Pig Iron.—Production no longer shows any increase. With the rise of the coke price to 97 fr. for August, French furnaces are exercising care to prevent an excess of production, which would increase the price decline. The current price of chill-cast foundry pig iron, No. 3 P. L., is 207 to 210 fr., with quotations as low as 205 fr. and up to 215 fr. per metric ton. A contract for 1000 tons of basic was made a few days ago at 195 fr., producing works.

British East Coast hematite, mixed numbers, is now worth 300 to 310 fr., delivered French northern ports. The present prices of the Comptoir des Fontes Hématites are as follows:

	Fr. per Metric Ton
Northern and western coast area	295 to 305
Eastern area	305 to 315
Center and Paris area	325 to 330

Semi-Finished Steel.—There is more activity in export than in domestic sales. However, works are not booked as full as they were some time ago and orders are being accepted for delivery within a month or six weeks. The present inland prices for mild steel are:

	Francs
Ingots	290 to 300
Blooms	310 to 320
Billets	330 to 340

For export: 5 fr. (French), less f.o.b. Antwerp than the above prices.

Beams.—The Comptoir Sidérurgique decided, at its meeting July 20, to maintain its base price on beams at 475 fr. This decision was taken against the advice of some members of the Comptoir, who, because of the increase in the price of coke for August, favored a higher price. The quotation of 475 fr. was introduced at a time when coke cost the blast furnaces 75 fr. at the Franco-German frontier, compared with the August price of 97 fr. A few small deals in beams for export were recently concluded at 360 fr. f.o.b. Antwerp (French currency).

Rails.—A contract for 4000 to 5000 tons of grooved rails, for the Pekin tramways, to be delivered at Antwerp before Sept. 15, has been taken by a mill of Meurthe-et-Moselle against keen competition from the United States.

Sheets.—The volume of orders taken by the Comptoir des Tôles is still increasing: 30,000 to 32,000 tons in May, 35,000 to 38,000 tons in June, and a still higher rate in July. These figures include orders received by members from their branches. Delivery is now 10 weeks for light sheets and 6 weeks for heavy sheets.

Plates.—On the option of 50,000 tons of plates taken a few months ago with the Comptoir des Tôles by French shipbuilding companies, about one-half has been taken up. To enable them to purchase the other half, the shipbuilders have asked the Comptoir des Tôles to make an effort to obtain from mills advantageous prices for 17,000 tons of special shapes which they need.

Germany has requested that her coal deliveries on the reparations account to France, Luxemburg, Belgium and Italy, amounting monthly to 1,916,000 metric tons of coal and coal equivalent (of which 1,150,000 tons goes to France) be reduced to 1,340,000 tons, as follows:

400,000 tons of coke (equivalent to 533,000 tons of coal);
150,000 tons of coking slacks;
507,000 tons of other coals;
150,000 tons of briquettes of lignite.

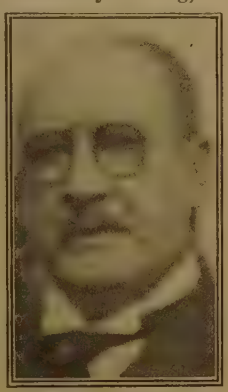
The Reparations Commission has decided that from Aug. 1 to Oct. 31 the monthly quantity of coal and coal equivalent to be supplied by Germany, on reparations account, to the four countries shall be 1,725,000 tons:

620,000 tons of coke (equivalent to 826,666 tons of coal);
100,000 tons of coking slacks;
798,334 tons of other coals and briquettes of lignite.

The 1,725,000 tons will eventually be increased by 20 per cent of any surplus production of the German coal fields (not lignite), Upper Silesia excepted, beyond 8,300,000 tons per month.

OBITUARY

FRANK TOOMEY, SR., founder of Frank Toomey, Inc., and a noted figure in the machine tool trade, died Wednesday morning, Aug. 2, at the home of his daughter, Mrs. S. Guy Megargee, Scranton, Pa., after a brief illness. He was born in Liverpool, England, 72 years ago, and came to this country when a young man and became affiliated with the Baxter Engine Co., Hartford, Conn. He had charge of its Centennial Exposition exhibit at Philadelphia in 1876. In the same year he established the business which now bears his name. He was among the first to rebuild used equipment. In 1909 the business was incorporated and he retired from the presidency in 1916 to be succeeded by his son. The corporation will be conducted by the present officers, Frank Toomey, Jr., being president.



FRANK TOOMEY

WALTER H. BROWN, sales manager Standard Supply & Equipment Co., Pittsburgh, was killed in an automobile accident on the evening of Aug. 1. For more than twenty years prior to becoming affiliated with the Standard company he was associated with the Pittsburgh Gage & Supply Company, Pittsburgh, of which he had been sales manager for a period of ten years. He was 40 years old.

CHARLES S. REA, vice-president and Pittsburgh district sales representative of the Ralston Steel Car Co., Columbus, Ohio, died at the Allegheny General Hospital, Pittsburgh, Aug. 1, following an apoplectic stroke. He was 63 years old and had been a prominent figure in commercial and civic affairs in Pittsburgh.

WILLIAM HEWITT, Trenton, N. J., formerly vice-president Trenton Iron Co., died Aug. 2 in Philadelphia, following an operation of the throat. He was 68 years old.

CHARLES G. COOPER, founder of the C. & G. Cooper Co., Mt. Vernon, Ohio, long conspicuous as a builder of Corliss type of steam engines, died at his home in that city on Aug. 4, at the age of 75.

Let Steel User and Steel Maker Co-operate

(*Concluded from page* 348)

these results can be obtained in a 15 or 20-in. diameter forging. Were the engineer to attempt to purchase a forging requiring such high properties, the reliable steel manufacturer would try to discourage such requirements, but the engineer might find some one hard up for work who would try to furnish it, and the chances for its giving satisfactory service would be very slight.

I believe I am safe in stating that cement machinery must stand as much or more abuse than machinery for most other industries, on account of the abrasive materials handled and the considerable amount of dirt and dust always found in the cement plant which becomes imbedded in bearings. Some parts must stand both wear and shock, and some must stand either shock alone or wear alone. In the case of parts which must stand both wear and shock, a happy combination can be obtained by means of case hardening the outside surface, which will resist wear, retaining a strong and tough core to resist shock. In the case of a part which is not subjected to shock, this can be made of a steel which can be hardened throughout. In the case of a part which must stand severe shocks and vibrations, certain steels can be specifically heat treated to stand up for this service.

It is my impression that certain parts, such as gudgeons, liner plates for tube mills and crushers, are expected to wear out in a certain length of time, and replacing material is ordered without investigating the possibility of obtaining a material which will give double the service or better. It seems that breakages and excessive wear are accepted as a matter of course by many cement plants. There are manganese steel castings made which stand up best under certain conditions at one plant, while some other special steel casting or forging will give better service at another plant. Each plant has its own individual problems which can be worked out by the proper co-operation with reliable steel manufacturers.

Take pinions, for example. Cast iron pinions are cheapest if the first cost is considered only. Occasionally a cast iron pinion makes an exceptional record, but how often is a cast iron pinion obtained which wears out or breaks in a short time, usually breaking before being worn out, and where the cost of labor and curtailment of production on account of repairs would make the ultimate cost considerably higher than if good special-steel, heat-treated pinions had been purchased in the first place.

Quality According to Price

When a cement company wishes a forging and is only willing to pay a certain limited price per pound it will receive a forging which is worth the price paid for it and no more, since in order to make a forging at such a figure the steel manufacturer will have to select his steel accordingly, and perhaps at this price he cannot afford to heat-treat it. If a forging is required, payment of a fair price to a reliable manufacturer will secure a special steel properly selected and will insure careful heat treatment for the service required. Though such a forging might cost three times as much per pound, it would probably last more than three times as long. But if it outlives the lower priced forging only 2½ times, it would be cheaper in the end, on account of continued operation during this extended period and saving on cost of taking down and reassembling.

In the case of the steel casting failures on the jaw crushers mentioned earlier in this paper, these castings would no doubt have been cheap at 50 cents a pound if they had not broken.

Co-operation Between Designer and Metallurgist

In our corporation, we find it valuable for our plant engineers and engineers who are designing or building machinery to keep in constant touch with our metallurgical departments. When they design a machine to perform a certain operation, they first consult the metallurgists to determine which steel will best stand up in service, and the physical properties which can be obtained from this steel, and they then design their machinery accordingly. In some plants the designing engineer will design his machinery independent of metallurgical advice and make some parts so light and at the same time requiring extremely high physical properties, that he works a hardship on the metallurgical and heat-treating departments. The latter then resort to the use of high priced alloy steels, which may be very sensitive to heat treatment, and which may crack and distort during the drastic heat treatments needed to obtain the extremely high physical properties. This results in high shop losses and often in the installation of defective parts, causing failure in service. Where there is close co-operation between the engineer and metallurgist, such a condition is not likely to occur, and although the machinery may be somewhat heavier, it will be more efficient.

The metallurgist finds it necessary many times to consult with the engineer before recommending steels for certain parts in order to become acquainted with the exact details of the duty which the particular parts are to perform. We find in our corporation that neither can get along without the other, and certainly this same condition must hold true with the cement industry or any other industry using iron or steel.

Far East a Market for American Labor-Saving Machinery

That there are numerous possibilities for business with the Far East and that there is a good market there for labor-saving machinery of all kinds, is the impression of Henry Harnischfeger, president Pawling & Harnischfeger Co., Milwaukee, Wis., builder of cranes and machine tools, who recently returned from an investigation of business conditions in Japan, China and India.

The Far Eastern countries, says Mr. Harnischfeger, are suffering from the effects of the world-wide business depression, since there is a large overstock of materials of all kinds, which must be used up before new supplies will be needed. Contrary to the general opinion, there is a growing market there for labor-saving machinery of all kinds. This is because of the fact that labor conditions are slowly reaching a point where costs of construction and manufacture are high.

He found considerable activity in large engineering projects, such as power plants, drainage, irrigation and building construction. There is a large amount of construction work to be done in the interior of India, says Mr. Harnischfeger, but up to this time it has been particularly hazardous because of loss of life among workmen through wild beasts and reptiles. It is believed that this work can be done very much more safely with the use of machinery.

Mr. Harnischfeger finds the Indian people well disposed toward American-made products. They feel that owing to the vastness of their own country and also of the United States we have had problems similar to theirs and for this reason the machinery designed for the construction of such developments as the Erie barge canal, the Panama canal, the Mississippi flood control and the several gigantic irrigation projects will meet their conditions. These experiences have not been shared by European manufacturers, he emphasized, as they have never had to contend with such large scale enterprises.

The Pittsburgh Steel Co. has received a Federal permit to construct a loading dock on the right bank of the Monongahela River, 3300 ft. above Dam No. 4. The loading dock is for the transfer of materials from railroad cars to barges. Principal material to be handled is slag, cinder and mill refuse, which is to be used in filling and reclaiming other lands of this and allied companies along the river. The American Manganese Mfg. Co., Dunbar, Pa., also received a Federal permit to construct a tipple for the purpose of loading coal in barges on the right bank of the Monongahela River, 6974 ft. west of Point Marion, or 1.3 miles above Lock and Dam No. 8.

GERMAN PRICES AGAIN RAISED

Continued Collapse of the Mark Makes Further Advances Likely—Imports Balance Exports

(By Cable)

BERLIN, GERMANY, Aug. 4.

The new exchange collapse produced convulsive activity in the steel market, the violent demand increasing the shortage of heavy semi-finished products. Prices are rapidly rising. Effective Aug. 1 the Eisenwirtschaftsbund raised all hematite pig iron from 8265 to 11317 m. (from $11.80 to $16.20) per metric ton. Other grades were increased correspondingly.

The Steel Syndicate has also raised all prices, ingots being increased from 8520 to 14,480 m. (from $12.20 to $20.50) and bars from 11,470 to 19,470 m. (from $16.40 to $27.80).

Both the Eisenwirtschaftsbund and the Steel Syndicate have called new meetings to discuss further price increases.

As a result of these new price levels and the home shortage, imports of pig iron and other staple iron and steel products are now about balancing the exports. Exports of pig iron, January to May inclusive, totaled 83,555 metric tons against imports of 99,154 metric tons. Exports of bars, girders and bands were 217,488 metric tons, compared with imports of 211,051 metric tons.

Thin Aluminum Foil Made in Germany

During the war aluminum became more or less one of the substitute materials in Germany, being used in a number of instances in place of copper, steel, tin, and so on. After prolonged research, Dr. H. C. Paullsen has succeeded in rolling aluminum into foil 1/200 mm. in thickness and has also evolved, as a result of further experiments, a method of annealing it so as to make it as pliable as tin foil, according to the London *Ironmonger*. In all respects aluminum foil is very similar to tin foil, and may be colored and printed in the same way.

The great advantage obtained by the use of aluminum foil is, of course, its lightness. It appears that in Germany it is largely used for covering chocolate candies and that, indeed, there are now very few chocolate manufacturers who do not use it. Cigarette factories are also making use of this foil. These and similar applications have so extended the manufacture in Germany that a syndicate has been formed, comparable with the steel syndicate, to watch the interests of producers and to promote research on the development of the product.

Electricity and the Italian Steel Industry

The Italian steel industry and its rapid growth, due to application of electrical power, is discussed by Dr. Dornhecker in Stahl und Eisen for June 1. The desire to be independent of coal, which has to be imported, and to use the available water powers, has brought about a marked expansion of electric furnace operation in the Italian steel works and foundries.

Specially noteworthy is the widespread use of furnaces of large capacity, a very careful estimate gives at least 25 furnaces of 10 to 15 tons capacity in operation, while the number of furnaces over 2 ton capacity amounts to at least 50. The furnaces are distributed as shown in the following data, although in regard to the smaller plants the information may not be entirely accurate:

J. Gio. Ansaldo Co., at Aosta:
- 4 Heroult furnaces, each 15 tons.

Ansaldo Co., at Cornigliano:
- 3 furnaces of 2 tons, 2 furnaces 10 tons, Tagliaferri system.

Lombarde Steel & Iron Co., at Sesto S. Giovanni:
- 5 Heroult furnaces of 15 tons.
- 2 arc furnaces of 3 tons, Bassanese system. (This is a modification of the Stassano furnace.)

Fiat Co., at Turin:
- 6 furnaces of 5 tons, 2 furnaces of 20 tons, Fiat system.

Italiana Ernesto Breda Co.:
- 6 Heroult furnaces of 15 tons.
- 5 Stassano furnaces, 3 to 5 tons.
- 2 Stassano furnaces, 2 tons.

Stablimenti di Dalmine (Mannesmann):
- 4 Heroult furnaces of 15 tons.
- 2 Heroult furnaces of 6 tons.

Franchi Gregorini, at Brescia:
- 1 Heroult furnace of 15 tons (at Allione).
- 2 smaller Heroult furnaces of 2 tons (at S. Eustacchio, Brescia).

Giuseppe Redaelli and Brothers, Mailand:
- 2 arc furnaces of 8 to 10 tons.

Calcotto Steel Co., at Lecco:
- 1 arc furnace of 8 to 10 tons.

Italian Tubi Togni Co., at Brescia:
- 2 electrometal furnaces of 4 tons.
- 1 electrometal furnace of 2 tons.

Fonderia Milanese di Acciaio, at Mailand:
- 2 electrometal furnaces of 4 tons, 6 furnaces of their own design between 2 and 4 tons.
- 2 Stassano furnaces of 1 ton. (They also have 4 open-hearth furnaces, 5 converters and 12 cupolas.)

Franco Tosi Co., at Legnano:
- 2 furnaces of 4 to 5 tons (on gray iron).
- 4 furnaces from 2 to 5 tons.

Terni:
- 1 Heroult furnace of 15 tons.
- 2 Bassanese furnaces of 1 ton.

Metallurgica Marcora Busto Arsizio:
- 3 furnaces of 3 to 5 tons.

Manfredi Bongivanni Cinnes:
- 2 electrometal furnaces of 2½ to 5 tons.
- 2 Bassanese furnaces, 1 ton.

The remainder of the paper consists of a description of the new Fiat furnace and foundry. This furnace was described in THE IRON AGE, July 20, 1922, p. 151. Every effort has been made to shorten the melting time and prevent loss of heat through the various openings, especially those in the roof for the electrodes. The consumption of Acheson graphite electrodes in these furnaces has been reduced to 2½ kg. per metric ton of product (5.6 lb. per gross ton). The furnaces are of 5 to 6 tons capacity, and seven casts are made per 24 hr. In the original paper is given a cross section and plan of the new foundry, the buildings of which are of reinforced concrete, and the detailed description shows the importance of this modern Italian plant.

G. B. W.

The Australian Steel Trade

The directors of the Broken Hill Proprietary Co. have issued a statement, according to the London *Ironmonger*, giving a gloomy picture of the industry, which, they say, is closing down solely from an inability to secure orders at prices below those for which products can be imported. Great Britain and America, it is added, are enabled to compete owing to reductions in the prices of coal and wages. The works would be able to restart if large coal were reduced by 4s. and small coal by 6s. per ton, and if a 48-hr. week were reconstituted before operations are recommenced. Moreover, the company is unable to start at the New South Wales basic wage of £3 18s. per week, but could restart at a minimum wage of £3 10s.

British Columbia Steel Plant Proposed

Legislation for the establishment of iron and steel works in British Columbia will be put through at the next session of the legislature, according to John Oliver, Victoria, B. C. The announcement was made following a cabinet meeting to representatives of the Coast Range Steel Co., a $15,000,000 corporation organized last year under H. J. Landahl. According to the announcement the British Columbia Government will unite with the British and Dominion Governments and guarantee as its share bonds not to exceed $4,000,000. Under plans which have been discussed between interests of the Coast Range Steel Co., the British Columbia Government and the Imperial Board of Trade, a plant to cost $12,000,000 and have a capacity of 120,000 tons of steel per annum will be constructed in the province.

BRITISH FOREIGN TRADE

June Steel Exports Second Smallest of the Year—Imports Very Low

The June official returns of British foreign trade in steel and iron show that the total exports were 249,089 gross tons. This is a decrease of 51,892 tons from May. The June exports are next to the smallest for the year, February being 228,370 tons, and compare with a monthly average of 267,047 tons for the first quarter. In June, 1921, the exports were only 66,301 tons. In these totals scrap is included. For the first six months of this year the total exports were 1,625,635 tons compared with 879,130 tons for the same period in 1921.

The June imports were 58,856 tons, or the lowest this year. The monthly average for the first quarter was 82,536 tons. In June, 1921, the imports were 88,083 tons. These figures also include scrap. The following table shows comparative data:

British Steel Exports and Imports, Gross Tons

	Exports	Imports
April, 1922	274,422	72,074
May, 1922	300,981	72,427
June, 1922	249,089	58,856
Aver. per month, first quarter, 1922	267,047	82,536
Aver. per month, second quarter, 1922	274,830	67,785
Aver. per month, 1921	144,885	152,734
Aver. per month, 1920	274,881	128,685
Aver. per month, 1919	188,519	50,801
Aver. per month, 1913	420,757	195,264

The following table covers the principal exports:

Principal British Exports, Gross Tons

	Average per Month		June	
	1913	1921	1921	1922
Pig iron	78,771	8,602	10,269	43,402
Steel rails	41,676	14,698	1,173	10,928
Steel plates	11,162	10,673	1,336	3,745
Galvanized sheets	63,506	17,635	4,471	35,432
Steel bars	20,921	8,927	2,115	15,961
Tin plates	41,208	18,873	8,801	37,134
Black plates	5,679	1,178	419	3,784
Steel sheets	.....	.....	684	15,180
Total exports, first 6 months, 1922				1,625,635
Total exports, first 6 months, 1921				879,130

As in April and May exports of steel rails, galvanized sheets, pig iron and tin plate have shown the most marked recovery. To this must be added steel sheets and bars.

Pig iron imports in June were 4,082 tons compared with a monthly average in 1921 of 55,564 tons.

Iron ore imports in June were 270,924 tons, which compares with a monthly average in 1921 of 157,298 tons.

Manganese ore imports in June were 18,798 tons. Last year they were 14,405 tons per month and in 1913 they were over 50,000 tons per month.

Growth of Gray Cast Iron

In the April number of the Science Reports of the Tohoku Imperial University, Japan, Tario Kikuta discusses "The Growth of Gray Cast Iron During Repeated Heatings and Coolings." In summarizing his investigations, the author states that it is improbable that the growth of gray cast iron during repeated heating and cooling through the A_1 range is caused by the pressure of occluded gases, in the manner as conceived by Prof. Okôchi and Mr. Satô.

As the result of measurements of the density found in specimens after different heat treatment and also of thermal dilatation during heating and cooling continuously, the author concludes that the growth of gray cast iron during the first heating through 700 deg. to 800 deg. is partly attributable to the decomposition of cementite. The continuous growth of gray cast iron in a vacuum during repeated heating and cooling through the A_1 range is the effect of the differential expansion at different microportions of the same specimen, numerous fissures or cavities being thus formed in the region of graphite flakes. In an oxidizing atmosphere, the growth is accelerated by oxides formed and filling the fissures or cavities during Ar_1 transformation.

Thus, it will be seen, the effect of oxidation on the growth of cast iron is indirect. The growth of white cast iron is almost completed in the first heating to 800 deg. About one-third of the whole expansion is due to the decomposition of eutectic and pearlitic cementites, and the other two-thirds to the minute fissures or cavities formed by the irreversible expansion in different microportions of the same specimen.

The elongation observable at higher temperature than the A_1 point is due to the pressure of occluded gases, as conceived by Prof. Okôchi and Mr. Satô. From the results of the present investigation, the author concludes that the oxidation theory put forward by Rugan and Carpenter seems to be untenable.

United States Principal Importer of Cleveland Iron

The United States was the principal importer of Cleveland pig iron from England in June, according to Russell M. Brooks, vice consul at Newcastle-on-Tyne, who reports the figures to the Department of Commerce.

The total iron exports from the Cleveland district in June were 71,969 tons, a drop from 79,389 tons in May and 86,902 tons in April. Loadings to the United States constituted more than one-fifth of June's total, amounting to 16,025 tons, or 7125 tons more than this country took in May, thus placing America at the head of importers of Cleveland iron.

An important agreement between Cumberland pig iron makers and blast furnace men has been concluded under which the wages of the employees will continue to be regulated by the 1919 sliding scale agreement until the middle of October, 1922. This means that there will be no further reduction below 35½ per cent (corresponding to £4 18s. 6d. per ton for iron) on standard rates in the wages of blast furnace men until the commencement of second full pay in October of this year.

If at that time the ascertained prices justify an advance in wages the men will be paid the increase. By this the question of fixing new rates of wages for the industry is postponed until October, when it is hoped that more stable conditions will prevail in the English iron trade. Any stoppage of work threatened is now averted until future arrangements can be made.

IRON AND INDUSTRIAL STOCKS

Securities Have Continued to Fluctuate in Narrow Limits

The movement of prices for iron and industrial stocks the past week indicated no abnormal apprehension on the part of industry. Securities have fluctuated within narrow limits. This fact possibly is explained in part, at least, by general business, which continues remarkably good despite strike handicaps. Increased car loadings and receding surplus idle equipment impress one with the country's commercial vitality and ability to earn a fair return on property investment.

The range of prices on active iron and industrial stocks from Monday of last week to Monday of this week was as follows:

Allis-Chalm.	53 - 54½	Lima Loco.	108¼-110½
Allis-Chalm. pf.	- 98½	Lima Loco. pf.	53¾- 55⅝
Am. B. S. & F.	64⅝- 65⅛	Midvale Steel	33¾- 36¼
Am. Can	58 - 61⅛	Nat.-Acme	16⅞- 17
Am. Can pf.	-109	Nat. En. & Stm.	54¾- 57⅝
Am. Car & Fdry.	168 -172	N. Y. Air Brake	- 80
Am. Car & F. pf.	-123	Nova Scotia Stl.	- 31
Am. Loco.	118 -121½	Otis Steel	11 - 11⅜
Am. Loco. pf.	117½-118	Otis Steel pf.	57 - 59
Am. Radiator	101½-104½	Pitts. Steel pf.	- 96½
Am. Rad. pf.	-119	Pressed Steel	- 82
Am. Stl. Fdries.	37⅜- 39	Pressed Steel pf	-100
Am. Stl. F. pf.	- 99⅜	Ry. Stl. Spring	106 -109¼
Bald. Loco.	122⅜	Replogle Steel	32 - 34¼
Beth. Steel	- 74	Republic	70½- 74½
Beth. Stl. Class B	76¼- 79	Republic pf	91¾- 92⅞
Beth. Stl. 8% pf.	97⅞- 98	Sloss	47 - 47½
Br. E. Stl. 1st pf.	- 74	Steel of Canada	73½- 74
Br. E. Stl. 2d pf	30⅛- 30½	Superior Steel	31 - 32
Chic. Pneu. Tool	- 71	Trans.-Williams.	- 39
Colo. Fuel	30⅛- 31	Un. Alloy Steel	- 38¼
Cruc. Steel	90¼- 94½	U. S. Pipe	34 - 36
Cruc. Steel pf.	93 - 93½	U. S. Pipe pf.	72 - 73
Gen. Electric	179¼-180	U. S. Steel	100 -102¼
Gt. No. Ore Cert.	39¾- 40¼	U. S. Steel pf.	118¾-120
Gulf States Steel	82 - 85	Vanadium Steel	48¼- 51¼
Inland Steel	- 51	Va. I. C. & Coke	- 80
Int. Har.	103¼-104⅜	West'house Air B.	- 94
Int. Har. pf.	-117	W'house E. & M.	61 - 63⅛
Lack. Steel	76¼- 78¾		

Machinery Markets and News of the Works

MARKET SPOTTY

Business Continues Fair in Some Centers, in Others Dull

Railroad Lists Still Dormant—Market in Cranes Fairly Active—Price Changes Noted

Activity during the week may be described as spotty. This has been the case both as between machine tool centers and also as to the distribution of orders among manufacturers in the various centers reporting fair business. Improvement over the previous two weeks is noted in Cincinnati and the New York market has been fairly active. In the Pittsburgh, Chicago and New England districts, on the other hand, the business done has been very limited.

A good demand for grinding wheels has been noted, the automotive industry taking, perhaps, the most. This has been more or less gradual since March, and is said to have become as good, if not above, pre-war figures.

Confidence is still felt generally that with the railroad and coal situations adjusted sales will expand. In Milwaukee, shops needing tools badly are sending in rush orders. It is expected that the Louisville & Nashville will shortly close on a number of tools.

In prospective business opportunities may be mentioned the Belle City Malleable Iron Co., Racine, Wis., which has undertaken a $750,000 plant extension. The reported purchase by the Ford Motor Co. of a site for a ten million dollar assembling plant at East Chicago, Ind., ought to mean the purchase of considerable equipment.

The International Harvester Co., after buying a few machines against its inquiry, has indefinitely postponed action on the remainder of the tools listed. The Continental Motors Co. continues to place scattered orders or tools.

In some centers used tools continue in demand, although prices on good second-hand machines are nearly as high as new machines of similar make.

Prices remain substantially unchanged. The Rhodes Mfg. Co., Hartford, has announced a reduction of 15 per cent on its line of small shapers and slotters, and the P. Pryibil Machine Co., Inc., New York, a reduction of 10 to 15 per cent on its spinning lathes.

The market in both overhead and locomotive cranes is showing a fair degree of activity. A new stock of used locomotive cranes may become available from the public auction of 36 cranes held by the Government at Boston. The Lima Corporation, Lima, Ohio, has placed six cranes. Further purchases are said to be contemplated.

New York

NEW YORK, Aug. 8.

ATTENTION in this district is still largely focused on the list of the Wright Aeronautical Corporation, Paterson, N. J., on which two used engine lathes have so far been purchased. The remainder of the list is expected to be closed during the current week, both new and used tools being purchased. The General Electric Co., in addition to the seven lathes and six shapers reported bought last week, has placed an order for four 16-in. tool room lathes and will probably close this week on two turret lathes. It has also purchased four special engine lathes for its Lynn shops. The Manila Railroad, Manila, P. I., has ordered a 60-in. tire mill and the American Car & Foundry Co. has purchased a multiple spindle drill.

An inquiry for prices on a small lathe and a shaper has been issued by the Brooklyn Rapid Transit Co., Brooklyn, N. Y. On the whole, the major part of the present business is evidently going to dealers in used tools. One dealer reports orders during the past week for three large 40-in. to 48-in. lathes. Although purchasers as a rule obtain quotations on new tools, they often place the business with sellers of used machinery. The market, however, is fairly active, and with the railroad and coal strikes settled prospects for considerable activity are believed to be good.

Despite the strikes, which are undoubtedly acting as a deterrent upon many companies which would otherwise issue inquiries for cranes, the market in this district on both overhead and locomotive cranes is fairly active. A few inquiries are still pending, among which is the 40-ton overhead traveling crane to be purchased by Sanderson & Porter, New York, for Frackville, Pa., probably closing sometime this week. Business in new locomotive cranes continues to show improvement as available used cranes become less numerous. A new stock of used locomotive cranes may become available in this district from the public auction of 36 cranes held by the Government at Boston, Aug. 9.

Among recent purchases are:

J. G. White Engineering Corporation, 43 Exchange Place, New York, a 20-ton, 50-ft. boom locomotive crane from the Ohio Locomotive Crane Co.

Canadian National Railways, Toronto, Ont., a 20-ton, 50-ft. boom locomotive crane with bucket from the Industrial Works.

Grand Trunk Railway, Montreal, Que., a 160-ton, wrecking crane from the Industrial Works. This is the second purchased within a month.

Union Pacific Railway Co., Omaha, Neb., a 15-ton, 45-ft. boom locomotive crane from the Industrial Works.

American Car & Foundry Co., 165 Broadway, New York, a 15-ton locomotive crane from the Orton & Steinbrenner Co.

Ballin Construction Co., Utica, N. Y., a 20-ton, 70-ft. boom used Brownhoist locomotive crane from Philip T. King, 30 Church Street, New York.

McClellan & Junkersfeld, 45 William Street, New York, a 110-ton, 55-ft., 6½-in. span, 4-motor, overhead traveling crane for the Union Electric Light & Power Co., St. Louis, Mo., from the Niles-Bement-Pond Co.

Long Island Railroad, Brooklyn, N. Y., a 25-ton 60-ft. span, 4-motor, gantry crane from the Whiting Corporation.

Long Island Railroad, Brooklyn, N. Y., a 10-ton, 58-ft. 9-in. span overhead traveling crane from the Niles-Bement-Pond Co.

Voska Foech Sidlio Marble & Slate Works, Astoria, L. I., a 600-ft. tramrail from the Cleveland Tramrail Co.

Friedman Marble & Slate Works, 654 Vernon Avenue, Long Island City, extension to tramrail system from the Cleveland Tramrail Co.

Town of Springwells, Wayne County, Mich., two 5-ton, 3-motor cranes, 30-ft. and 80-ft. spans, from the Northern Engineering Works.

W. S. Zitterell Co., Webster City, Iowa, a 10-ton overhead traveling crane from the Northern Engineering Works.

H. P. Deuscher Co., Hamilton, Ohio, a 2-ton electric hoist from the Northern Engineering Works.

Salmon Falls Mfg. Co., Salmon Falls, N. H., a 20-ton, 30-ft. 10-in. span, hand power crane from the Roeper Crane & Hoist Works.

Grasselli Chemical Co. for Grasselli, N. J., a 30-ton, 8-wheel, locomotive crane with bucket from the Orton & Steinbrenner Co.

Warner Sugar Refining Co., New York, a 10-ton overhead traveling crane for use in Cuba, from an unnamed builder.

American Radiator Co., Buffalo, N. Y., two 3-ton, 29-ft. span and 18-ft. span and one 1-ton, 47-ft. span electric cranes from an unnamed builder.

The Schumacher Mill Furnishing Works, P. O. Box 2, Port Melbourne, Victoria, Australia, desires equipment for perforating sheets and thin plates and asks for quotations, f.o.b. New York, with illustrations and descriptions of the range of machines needed for perforating work. On deciding what machine seems suitable, payment would be made in New York and shipments made through the company's shipping agent in New York.

The Universal Last Co., 191 Worth Street, New York, is taking bids for a new three-story plant, 80 x 130 ft., for the manufacture of iron lasts, etc., at Clifton Place and Classon Avenue, Brooklyn, estimated to cost about $100,000, including equipment. William Higginson, 15 Park Row, New York, is architect.

The Ulster & Delaware Railroad Co., 22 Ferry Street, Kingston, N. Y., has awarded contract to the Michand-Campbell Co., Inc., 77 Greenhill Street, for a one-story locomotive erecting shop, 75 x 154 ft. Charles Stowell, company address, is engineer.

The New York Steam Corporation, 280 Madison Avenue, New York, operating power utilities in the downtown district, has arranged for a bond issue of $1,000,000, a portion of the proceeds to be used for extensions and improvements. James D. Hurd is president.

The Long Island Lighting Co., 50 Church Street, New York, and the Nassau Light & Power Co., Mineola, N. Y., operating power plants and systems in the Long Island district, have been consolidated under the first noted name. The new company is planning for a bond issue of $3,000,000 and stock issue of the same amount, the proceeds to be used in part for plant extensions and improvements.

Joseph Breslauer, New York, operating an automobile service and repair works at 1986 Crotona Parkway, Fordham, has acquired the vacant property, 75 x 100 ft., on the Southern Boulevard, between 179th and 180th streets as a site for the erection of a new two-story plant.

The New York Central Railroad Co., New York, is making inquiries for a six-spindle bolt-threading and cutting machine, motor driven. C. S. White is purchasing agent.

The Brooklyn Edison Co., 360 Pearl Street, Brooklyn, has had plans prepared for a twelve-story operating building, for service departments, headquarters, etc., at Willoughby and Pearl streets, to cost about $1,000,000. The structure is part of the extension program arranged by the company, to include a new electric generating plant and automobile service building on property recently acquired at Third Street and Fourth Avenue. McKenzie, Voorhees & Gmelin, 1123 Broadway, New York, are architects for the first noted structure.

Thomas A. Edison, Inc., Lakeside Avenue, West Orange, N. J., manufacturer of electrical specialties, talking machines, etc., has leased the building on site 100 x 100 ft., at Freeman Avenue and Hamilton Street, Long Island City, for a new service works and distributing plant.

The New York Harbor Dry Dock Corporation, 32 Pearl Street, New York, will install a new 10,000-ton drydock with additional shop facilities at its yard at Rosebank, S. I. Other enlargements are under way, including the purchase of drydocks owned by the United States Shipping Board and heretofore leased. The company has arranged for an increase of $1,750,000 in plant investment. Charles E. Fraser is president.

The Hudson Motor Car Co., 1842 Broadway, New York, has leased the new automobile service and repair building, now being constructed on the Grand Concourse at a cost of $150,000, by the S. & L. Building Co., 1312 Clinton Avenue, and will occupy the structure immediately upon completion.

C. Brandes, Inc., 32 Union Square, New York, manufacturer of wireless equipment, headsets, etc., has arranged for the establishment of a new branch plant at Ottawa, Ont.

The Intercontinental Rubber Co., George H. Carnahan, 120 Broadway, New York, president, is perfecting plans for reorganization, to provide for extensions to the manufacturing plant in Mexico and improvement in properties in Sumatra. It is proposed to dispose immediately of bonds for $2,000,000, of which approximately $275,000, will be used for plant additions.

Hoisting equipment, conveyors, loading and unloading machinery, etc., will be installed at the new veneer lumber plant of the J. J. Bonneau Co., 315 East Thirty-fifth Street, New York, to be located on property, 131 x 284 ft., at Long Island City recently acquired.

S. M. DePasquale, 2975 Marion Avenue, New York, will take bids at once on a one-story automobile service and repair building on Webster Avenue, estimated to cost about $125,000. S. J. Kesler, 529 Cortlandt Avenue, is architect.

W. C. Durant, president, Durant Motors, Inc., 1819 Broadway, New York, is said to be organizing a new subsidiary, to be known as the Mason Truck Co., for the manufacture of motor trucks. The initial plants will be established at Bridgeport, Conn., and Flint, Mich. It will be operated as an independent unit.

The Anaconda Copper Mining Co., 25 Broadway, New York, has tentative plans under consideration for a brass fabricating plant, in connection with its mills at Great Falls, Mont., estimated to cost in excess of $500,000.

Mechanical unloading machinery, conveying equipment, motors, etc., will be installed at the two new incinerating plants to be constructed by the Borough of Queens, at Woodhaven and Winfield, L. I., respectively, estimated to cost about $275,000, each. Each plant will comprise two 50-ton units. Edward Richardson, Flushing, and Joseph P. Powers, Rockaway, L. I., are associated architects.

Campbell & Dannatt, Inc., New York, has leased the service works of the Urban Motor Car Co., 112-118 East Seventy-fifth Street, near Park Avenue, for a term of years. A service and repair plant will be operated.

The Standard Underground Cable Co., Perth Amboy, N. J., has awarded a contract to the Turner Construction Co., 242 Madison Avenue, New York, for a three-story and basement addition, 50 x 150 ft.

The Robian Corporation, New York, has leased the new building, 100 x 100 ft., at Tenth Avenue and Fifty-sixth Street, for the establishment of an automobile service and repair works.

The Westinghouse Lamp Co., Watessing district, Bloomfield, N. J., has plans under way for an addition.

Walter Butterfield, Wildwood, N. J., has awarded a contract to Rufus Hayes, Wildwood, for a one-story machine shop, at Holly Beach and Roberts Avenue, 50 x 80 ft.

The Standard Fuse Corporation, Paulsboro, N. J., has disposed of its local plant, constructed during the war, to a Trenton, N. J., manufacturing company, whose name is temporarily withheld. The plant will be remodeled and new machinery installed.

The Pennsylvania Railroad Co., Pennsylvania Terminal, New York, has acquired two tracts of property in the Kearny meadow section, Kearny, N. J., 107 acres, and 26 acres, adjoining, from the Newark Factory Sites, Inc., and the Trexler Lumber Co., respectively. The property will be used for new freight and classification yards, to include engine house, shops, etc.

A vocational department will be installed in the new high school to be erected at Mays Landing, N. J., two stories and basement, 110 x 190 ft., estimated to cost about $250,000. S. Huson Vaughn, Guarantee Trust Building, Atlantic City, N. J., is architect.

The Spicer Mfg. Co., South Plainfield, N. J., manufacturer of universal joints and other automotive products, will build a one-story addition to cost about $26,000.

A vocational department will be installed in the new high school to be erected at Clifton, N. J., for which bids on a general contract are being received, estimated to cost in excess of $800,000.

The J. L. Hamett Co., Cambridge, Mass., manufacturer of school equipment and supplies, will remove its branch factory at Brooklyn to a new four-story plant at 380 Jeliff Avenue, Newark, N. J., totaling about 44,000 sq. ft. of floor space.

The Natural Carbonic Gas Co., McClellan Street, Newark, has plans nearing completion for the erection of a one-story service and repair works, for company trucks and cars, estimated to cost about $100,000. Henry D. Scudder, Jr., Union Building, is architect.

The Standard Oil Co. of New Jersey, 31 Clinton Street, Newark, has leased the building at 61-63 River Street, for

a new distributing works, with service and repair department for company trucks.

Isaac G. Johnson & Co., Spuyten Duyvil section, Kingsbridge, New York, manufacturers of steel castings, have acquired property in the vicinity of the Spuyten Duyvil Creek and Harlem River Ship Canal, heretofore held by the New York Central Railroad, for future extensions.

The Long Island Railroad Co., Pennsylvania Terminal, New York, has awarded contract to the Turner Construction Co., 242 Madison Avenue, for two three-story and basement buildings at Morris Park, L. I., one to be used as a general shop and the other for warehouse service. L. V. Morris is chief engineer.

Philadelphia

PHILADELPHIA, Aug. 7.

The Standard Steel & Bearings, Inc., Fiftieth Street and Lancaster Avenue, Philadelphia, has plans under way for an addition to its branch plant at Plainville, Conn., to handle a considerable portion of the manufacture now being carried on at the Philadelphia works. Machinery will be transferred from the last noted plant to the Plainville extension.

Thomas B. Martindale, 3437 North Broad Street, Philadelphia, operating a Ford automobile agency, has construction in progress on a new two-story service and repair building, 100 x 265 ft., at Broad Street and Allegheny Avenue, estimated to cost in excess of $75,000.

The United Electric Construction Co., 1727 Sansom Street, Philadelphia, manufacturer of electric equipment, has leased the three-story building, 43 x 46 ft., at 2318-20 Sansom Street, for extensions.

Frank C. Snedaker & Co., Philadelphia, operating a mill work plant at Ninth and Tioga streets, have filed plans for a two-story addition, 20 x 113 ft.

The Sayre-Level Radio Co., Philadelphia, manufacturer of wireless equipment, has leased a portion of the six-story building at 41 North Tenth Street, for a local works.

The Roberts & Mander Stove Co., Eleventh and Washington streets, Philadelphia, will install a traveling crane in its new two-story plant at Hatboro, Pa.

The Paper Manufacturers' Co., Inc., 526 Cherry Street, Philadelphia, has acquired property at 408-18 North Fifth Street for plant extensions. It is now operating a factory at Thirteenth and Noble streets.

William Gerstley, Philadelphia, has acquired the four-story garage and warehouse building, 110 x 180 ft., at 1825-33 Market Street, for an automobile service and repair plant.

The Bureau of Water, City Hall, Philadelphia, is reported to be planning for the installation of two 3-ton traveling cranes at one of the city pumping plants. C. E. Davis is director.

James T. Finnesey, an official of Finnesey & Kobler, Inc., Twenty-sixth and Parrish streets, Philadelphia, manufacturer of automobile bodies, has awarded contract to Henry C. Dahl, 231 South Eighth Street, for a new building at Taney and Parrish streets, to cost about $20,000.

The Panelyte Board Co., Smith Building, 119-25 North Montgomery Street, Trenton, N. J., recently organized with a capital of $300,000, has plans under way for a new factory on the Whitehead Road to manufacture fibre products. The initial works will give employment to about 50 men. D. Mason Sutherland, Jr., formerly connected with the Agasote Co., Trenton, manufacturer of similar products, is president.

The Trent Tile Co., Klagg Avenue, Trenton, N. J., has awarded contract to the N. A. K. Bugbee Co., 306 East Hanover Street, for a one-story addition, 50 x 166 ft.

The Detroit Motors, Inc., care of Backes & Schroth, Broad Street Bank Building, Trenton, N. J., representatives, recently organized under Delaware laws to manufacture a six-cylinder automobile, has tentative plans for the erection of a local plant on site being selected. It is also proposed to establish a series of assembling works in a number of leading cities, with local service departments. Offices will be opened at Trenton at once. Milton Wells, formerly connected with Dodge Brothers, Detroit, is engineer and an official of the company.

The Armstrong Cork Co., Camden, N. J., manufacturer of insulating products, with headquarters on Twenty-fourth Street, Pittsburgh, will remodel and improve the plant of the Ancona Printing Co., Gloucester City, recently acquired, for a manufacturing works.

A one-story power house, 32 x 50 ft., will be constructed at the new furniture plant of the J. B. Van Sciver Co., Front and Federal streets, Camden, N. J. The Ballinger Co., 105 South Twelfth Street, Philadelphia, is architect.

N. B. T. Rooney, 503 Market Street, Camden, N. J., has had plans completed for a two-story automobile service and repair building, 52 x 100 ft., at Hadden and Sycamore avenues, estimated to cost about $55,000. A. B. Gill, Law Building, is architect.

The Ajax Rubber Co., Inc., Breunig Avenue, Trenton, N. J., manufacturer of automobile tires, is considering plans for new works at Sandusky, Ohio, estimated to cost in excess of $500,000, with machinery. Negotiations are under way with the Sandusky Chamber of Commerce for a site.

The Reading Hardware Co., Sixth and Willow streets, Reading, Pa., manufacturer of hardware and specialties, is having plans drawn for a new seven-story addition, 80 x 225 ft. George Gerhard & Sons, 619 Penn Street, are architects.

The Penn Central Light & Power Co., Altoona, Pa., has plans in progress for a new two-story power house at Saxton, Pa., with initial capacity of about 40,000 kw. Day & Zimmerman, Inc., 611 Chestnut Street, Philadelphia, operate the property and are engineers for the new plant.

The Elliott-Blair Steel Co., New Castle, Pa., will soon take bids for its new plant at Mercer, Pa., comprising five one-story buildings, estimated to cost about $200,000. George D. Blair, Sr., is president.

The Rochester Metal Weather Strip Co., Rochester, N. Y., will establish a branch manufacturing plant at East Stroudsburg, Pa.

Work will soon commence on a new power house, 50 x 76 ft., at the convent of the Sisters of Mercy, Dallas, Pa. James L. Morris, Coal Exchange Building, Dallas, is head of the building committee. F. F. Durang, 1220 Locust Street, Philadelphia, is architect.

The Motor Exchange, Inc., 327 North Third Street, Philadelphia, is said to be in the market for a new chain hoist, about 40 ft. lift.

The Philadelphia Suburban & Electric Co., Jenkintown, Pa., is arranging for an additional appropriation of $1,500,000, for extensions and improvements in its power plants and system at Jenkintown, Pottstown, Phoenixville and Coatesville, Pa. The company recently voted $1,938,760 for expansion, making a total appropriation of $3,438,760 to be used over 36 months.

The Middletown Ice Co., Middletown, Pa., will commence the erection of a new ice-manufacturing plant on Race Street.

A vocational department will be installed in the new two-story high school, 147 x 175 ft., to be erected at Plains, Pa., estimated to cost about $100,000. Austin L. Reilly, Bennett Building, Wilkes-Barre, Pa., is architect.

The Eastern Pennsylvania Power Co., Pottsville, Pa., will commence foundations at once for its new electric generating plant at Pine Grove, Pa., estimated to cost about $3,000,000, with machinery. It is expected to require close to 24 months to complete the station.

A bond issue of $75,000 has been voted by citizens of West Lampeter Township, Pa., for a new vocational high school to replace the school recently destroyed by fire. Henry Y. Shaub, Imperial Building, Lancaster, Pa., is architect.

The Hudson Mfg. Co., Inc., 144 Pearl Street, Trenton, N. J., is in the market for a 16 in. x 5-ft. Monarch lathe, a 20-in. shaper, 24-in. drill press, small tool grinder, two power presses and two kick presses. The officers of the company are W. W. Morell, president; D. A. Ungaro, vice-president, and J. Dale Herron, secretary-treasurer.

Buffalo

BUFFALO, Aug. 7.

The Buffalo General Electric Co., Electric Building, Buffalo, will commence the immediate erection of a new power house at Main and Hertel streets. P. F. Sellers is general superintendent.

O. E. Bray, 1009 Mutual Life Building, Buffalo, is planning to purchase machinery for the manufacture of special concrete blocks and kindred products at a number of plants in this section.

Fire, Aug. 1, destroyed a portion of the plant of the Rochester Composite Brick Co., Rochester, N. Y., with loss estimated at about $100,000.

The building committee of the Buffalo Club, 388 Delaware Avenue, Buffalo, will build a new power house to cost about $30,000, in connection with its proposed new club house. A list of equipment is being arranged. H. P. Werner is house commissioner.

The Niagara State Reservation Commission, Niagara Falls, N. Y., has tentative plans under way for the installation of elevating equipment to replace the present stairs at the Cave of the Winds. The elevator, with machinery, will

cost about $80,000. The State engineer, Albany, will supervise the installation. A. T. Clearwater, 280 Wall Street, Kingston, N. Y., is chairman of the commission.

August Schmidt, Doat Street, Buffalo, is having plans drawn for a new one-story automobile service and repair building, 60 x 100 ft., at Genesee Street and Rapin Place.

The Lindbeck Lumber & Mfg. Co., 16 River Street, Jamestown, N. Y., will install new conveying and other equipment in its plant addition.

The Jerge Motor Corporation, Buffalo, operating a local Ford automobile agency, will establish a new two-story service and repair works in the building at 1647-55 Genesee Street. Edward C. Jerge is president.

The Wood & Brooks Co., Military Road, Buffalo, manufacturer of mechanical player actions, etc., has recently acquired about 25 acres adjoining its plant for proposed expansion.

Shields Brothers, Bombay, N. Y., are arranging for the purchase of motors and other electrical equipment to be installed in their new three-story plant, 90 x 90 ft., for the manufacture of Indian goods, replacing a factory recently destroyed by fire. J. J. Shields is in charge.

The Upco Petroleum Co., Buffalo, has acquired about two acres on Military Road and will commence the immediate construction of a new refinery and distributing plant.

New England

BOSTON, Aug. 7.

THE machine-tool trade in this district the first seven days of August dropped to extremely small proportions. Aside from the Boston school business and the purchase of a thread milling machine by the Wentworth Institute, Boston, nothing worthy of mention has moved the past week. Buying of used equipment also shrunk materially, a milling machine, two screw machines and a large turret machine taken by a Quincy, Mass., company being the largest individual order booked. Manufacturer's representatives and dealers, however, are still working on prospects which in the aggregate total up fairly large.

The trade is confident that with the railroad and coal labor situations adjusted, sales will expand. A considerable amount of special work is being done by New England makers of machine tools for the railroads. Some falling off in such business is anticipated, however, inasmuch as the railroads are slowly increasing shop forces.

The Yale & Towne Mfg. Co. has advanced hoists 5 per cent.

Tentative plans have been made by the Standard Steel & Bearing, Inc., Plainville, Conn., for materially increasing manufacturing space.

Bids are in on a four-story, 80 x 100 ft. manufacturing plant to be erected by the Cambridge Rubber Co., 784 Main Street, Cambridge, Mass. The H. M. Hope Engineering Co., 228 Boylston Street, Boston is the engineer.

The Presbrey-Leland Co., New York, granite, having acquired certain Brattleboro, Vt. property, this fall will erect steel and concrete sheds thereon at an estimated cost of $150,000. It will require cranes.

Plans are being drawn for the Industrial Buildings, Inc., Bridgeport, Conn., for a five-story, 60 x 300 ft. manufacturing plant.

Bids have been taken on private plans calling for a four-story, 122 x 157 ft. addition to building No. 63 of the General Electric Co., West Lynn, Mass.

The Marine Engineering & Dry Dock Co. and the Lord Construction Co., Providence, have been purchased by Frederick S. Peck of that city. By the purchase Mr. Peck protects a mortgage he held on the property. It is his present intention to sell the machinery and other equipment.

Plans are being drawn for a one and two-story, 88 x 250 ft. garage and service station to be erected at Melrose and Russell streets, Providence, R. I., by the United Electric Railway Co.

The G. Drouvé Co., manufacturer of skylights and factory specialties, Fairfield, Conn., has plans drawn up for extensive alterations at its new plant, recently built. The project calls for about twenty tons of steel.

The Schroeder Brothers Mfg. Co., Inc., Torrington, Conn., has recently been incorporated under State laws with a capital stock of $100,000 to manufacture machine parts, tools, mechanical hardware, novelties, etc., by Gustave A., Ernest E. F., Arthur E. R., and Richard F. W. Schroeder. The company has a plant on Brook Street, Torrington.

The Chamber of Commerce, Bridgeport, Conn., is having preliminary plans drawn by Fletcher-Thompson, Inc., engineer, 542 Fairfield Avenue, for a five-story, 60 x 150-ft. reinforced concrete industrial incubator building on Railroad Avenue and Garden Street, to cost about $250,000.

The Charles H. Harris Co., Inc., Norwalk, Conn., manufacturer of windshield glass, etc., has awarded contract for another plant unit, one-story, 100 x 120-ft.

The New England Brass Mfg. Co., Danbury, Conn., has been incorporated under State laws with a capital stock of $22,000, by Mary E. Krebbs, Mohammed Inamruddin and Joseph Peon. It operates a plant on Maple Street.

A vocational department will be installed in the new high school to be erected at Somerville, Mass., for which an appropriation of $550,000, has been approved.

F. P. Carpenter, Manchester, N. H., is organizing a company to build and operate a one-story automobile service and repair works on Mechanic Street, to cost about $65,000. Plans are being prepared by H. W. Rhodes, 574-A Congress Street, Portland, Me.

The Winchester Water Works Co., 14 Beacon Street, Boston, has made application for permission to construct and operate a hydroelectric power plant at the United States Lock and Dam, Kentucky River, near Winchester, Ky.

The Great Northern Paper Co., Greenville, Me., will use the new building at Greenville Junction, now being completed, as a machine shop, for the care and repair of company motor trucks, tractors, trailers, etc., including parts manufacture.

A power house will be constructed at the new State normal school to be erected at New Britain, Conn., estimated to cost about $750,000. The State Board of Education, Hartford, is in charge. Guilbert & Betelle, 546 Broad Street, Newark, N. J., are architects.

The Quincy Electric Light & Power Co., Quincy, Mass., is arranging for the sale of a bond issue of $250,000, a portion of the proceeds to be used for extensions and improvements.

A vocational shop will be installed in the new two-story addition to the Lincoln School, Ticonderoga Avenue, Providence, R. I. Jackson, Robertson & Adams, Providence, are architects.

The Nashwaak Pulp & Paper Co., Bangor, Me., operated by officials of the Oxford Paper Co., 200 Fifth Avenue, New York, and the Bryant Paper Co., Kalamazoo, Mich., has plans for extensions and improvements in its mills at St. John, N. B., including equipment for increasing the capacity from 60 to 80 tons a day. The work is estimated to cost about $500,000.

The National Knife Co., Providence, recently organized, has taken over property at 30 Cory Street, for a local plant. John B. Fazioti heads the company.

A vocational department will be installed in the new two-story and basement high school to be erected at Conway, N. H., estimated to cost about $100,000. C. R. Whitcher, Beacon Block, Manchester, N. H., is architect.

Gray & Davis, Inc., Cambridge, Mass., manufacturer of automobile starting and lighting equipment, is disposing of a bond issue of $1,250,000, a portion of the proceeds to be used for extensions and improvements.

Following the recent closing of its Worcester, Mass., plant, the Torrington Co., Torrington, Conn., is planning to manufacture its line of vacuum cleaning machines and parts, heretofore carried on at Worcester, in a six-story building at the Torrington plant.

Baltimore

BALTIMORE, Aug. 7.

The Baltimore Concrete Products Co., Baltimore, has filed plans for the erection of a new one-story factory, 35 x 80 ft., at Kate Avenue and the line of the Western Maryland Railway.

The Maryland Motors, Inc., 601 St. Paul Street, Baltimore, is taking bids for a three-story service and repair building at 414-24 North Calvert Street, to cost about $75,000. Mottu & White, 324 North Charles Street, are architects.

The office of the general purchasing officer, Panama Canal, Washington, will take bids until Aug. 16, for equipment for the canal zone as follows, circular 1489: 3500 machine bolts; 2190 ft. brass tubing; 300 ft. galvanized wire netting; 8 boiler ranges; 240 galvanized water buckets; 350 ft. leather belting; 30,000 lb. corrugated roofing; 600 cable slips; 24 turnbuckles, and other miscellaneous equipment.

The Easton Utilities Commission, Easton, Md., will take bids until Aug. 17 for an addition to the municipal electric

light and power plant, including turbo-generator, exciter set, condenser, switchboard, cooling tower, etc.; also, for Diesel or semi-Diesel generating equipment. Carl J. Kiefer, 810 Fourth National Bank Building, Cincinnati, is consulting engineer.

The Southern Iron & Equipment Co., Grant Bulding, Atlanta, Ga., has inquiries out for a 20-ton, narrow gage, saddle tank locomotive. H. A. Merrill is in charge.

The Bureau of Yards and Docks, Navy Department, Washington, has awarded a contract to W. F. Martens, 112 Cutler Building, Rochester, N. Y., for a machine shop at the Naval Base, Pearl Harbor, H. T., to cost $185,366.

The Hearn Oil Co., Third and Commerce streets, Wilmington, Del., has acquired property on Mill Street, Salisbury, Md., for a new storage and distributing plant, estimated to cost about $35,000. Claude Hearn is manager.

S. T. Williams, 223 North Calvert Street, Baltimore, has inquiries out for a cableway hoisting engine, with winding and endless rope drum for electric drive, 35 to 40 hp.; also, for an electrically-operated air compressor, with or without motor.

The Locke Insulator Co., Baltimore, manufacturer of insulation products for high-tension electric service, will build a new one-story plant addition at Charles and Cromwell streets, estimated to cost close to $25,000. Plans have been drawn.

The Morris Brothers Co., Greenville, S. C., manufacturer of bobbins and other textile equipment, has awarded a contract to the Gallivan Building Co., for a new two-story plant, 40 x 128 ft. D. L. Morris is president.

The Sumter Ice & Fuel Co., Sumter, S. C., is arranging a list of equipment for installation at its proposed refrigerating and ice-manufacturing plant. E. H. Moses is general manager.

The Hackley Morrison Co., Richmond, Va., machinery dealer, is inquiring for a locomotive crane.

The City Council, Norfolk, Va., will receive bids until Aug. 17 for the erection of a new power house to be used in connection with the municipal terminal project. The Folwell-Ahlskog Co., 600 Seaboard Bank Building, is engineer. Charles E. Ashburner is city manager in charge.

The West Penn Power Co., Pittsburgh, has secured an option for the purchase of the municipal electric power plant at Oakland, Md. The new owner will make extensions and improvements.

T. Herbert Allen, Kenbridge, Va., is inquiring for coal unloading and conveying machinery.

A vocational department will be installed in the new high school to be erected at Kershaw, S. C., for which bids are being asked on a general contract. LaFaye & LaFaye, Columbia, S. C., are architects.

Pittsburgh

PITTSBURGH, Aug. 7.

WHILE the machine tool trade reports a good volume of prospective orders, actual business is very limited and the usual explanation is that buyers are delaying placing orders until there is a settlement of the coal and railroad strikes. The first week of the month indicates that August sales will make a poor showing compared with July and June. The electrical equipment market is not especially active, but the Allis-Chalmers Mfg. Co. recently took a 150-kw. Diesel oil engine generator unit for the Pittsburgh-Idaho Co., Inc. This is a duplicate order. The crane market shows a fair degree of activity.

Recent crane orders include a 50-ton 73-ft. span crane and a 15-ton 77-ft. span crane placed by the Apollo Steel Co., Apollo, Pa., with the Champion Engineering Co., Kenton, Ohio, while the Pittsburgh office of the Milwaukee Electric Crane & Mfg. Co. has taken an order from the Sandusky Cement Co., Cleveland, for a 10-ton 4-motor 80-ft. span bucket crane complete with 3-cu.yd. bucket, and the Northern Engineering Works, Detroit, through its Pittsburgh office has taken a 5-ton 75-ft. span, double hook crane for the Pittsburgh warehouse of the Crane Co., Chicago. The Northern Engineering Works also has taken four pillar jib cranes for the Pennsylvania Railroad, two for installation at the Pitcairn shops and two for Renova shops. The Shepard Electric Crane & Hoist Co. has taken a 25-ft. crane for Frick Co., Waynesboro, Pa. which also has placed two 5-ton cranes and one 10-ton crane with Maris Brothers, Philadelphia. The Jones & Laughlin Steel Co. has taken bids on two 10-ton cranes and two 15-ton cranes for its Southside works, and the award is expected shortly. The Weirton Steel Co., Weirton, W. Va., in addition to a ladle crane, probably will soon ask for bids on three other cranes, all of mill type construction. The United Engineering & Foundry Co. has taken bids on three cranes for installation at the St. Louis plant of the National Enameling & Stamping Co. This inquiry includes one 4-motor mill type 40-ton crane with 5-ton auxiliary, 75-ft. span, a 3-motor, 10-ton mill type crane, 75-ft. span, and a 4-motor, 10-ton double drum 35-ft. span crane. The Lima Corporation, Lima, Ohio, recently placed an order for two 150-ton double trolley, 75-ft span cranes; two 25-ton double trolley, 75-ft. span cranes and two 20-ton double trolley, 60-ft. span cranes, in connection with the extension to its plant.

The Duquesne Light Co., 435 Sixth Avenue, Pittsburgh, will commence the immediate erection of three new power houses, to cost about $900,000, including equipment. One structure will be located at Maryland and Forest avenues, Bellevue, Pa.; another in the Northside District, Pittsburgh, at Sandusky and North Diamond streets and the third at Penn and Swissvale avenues, Wilkinsburg.

The McKays Carriage Works, Erie Street, Grove City, Pa., manufacturer of automobile bodies, will build a one-story addition, to cost about $16,000. A list of equipment is being arranged.

The Barnett Steel Barrel Co., Los Angeles, Cal., is in negotiation with the Chamber of Commerce, Pittsburgh, for a site for the erection of a new Eastern branch plant to manufacture all-steel barrels. Donald Barnett is head of the company.

A vocational department will be installed in the new three-story and basement high school, 64 x 165 ft., to be erected at Meadville, Pa., for which foundations will be placed under way at once. It will cost close to $400,000. W. G. Eckles, Lawrence Savings & Trust Building, New Castle, Pa., is architect.

The Standard Motor Car Co., 5748 Baum Boulevard, Pittsburgh, is arranging for the manufacture of a four-cylinder automobile at its recently completed plant at Butler, Pa. It consists of a main assembling works, 200 x 800 ft., with a number of smaller buildings, and will be equipped for an output about 150 eight and four-cylinder motors per day. The company will remove its headquarters to the Butler plant.

The National Auto Service Co., New Kensington, Pa., has completed plans for a new one-story service and repair building, 60 x 70 ft., with extension, 25 x 60 ft., at 1030 Fifth Avenue, estimated to cost close to $50,000.

The Pittsburgh Nipple & Mfg. Co., Pittsburgh, recently reorganized, has removed its plant from Carson Street to 411 South Main Street, West End, where additional machinery will be provided for large increased output. Ferdinand Manus is president, Charles Fette, vice-president, and George B. Shaw, treasurer.

Hinman Brothers, 1017 Seventh Avenue, Butler, Pa., will build a new two-story automobile service and repair works, 100 x 150 ft., at Green Avenue and Eighth Street, estimated to cost about $65,000.

The D. N. Carlin Co., 125 Denniston Avenue, Pittsburgh, manufacturer of toys, is taking bids for a two-story addition, 34 x 115 ft., estimated to cost about $25,000. W. H. Stulen, 101 Market Street, is architect.

The Amicon Fruit Co., 81-87 East Naghten Street, Columbus, Ohio, will soon commence the erection of a new three-story and basement cold storage and refrigerating plant at Williamson, W. Va.

The Moore Lumber Co., Charleston, W. Va., is planning for the installation of a new band mill, industrial locomotive, trucks and other equipment.

The Raleigh Motor Co., Beckley, W. Va., is completing plans for a new three-story service and repair building, 50 x 145 ft., on East Main Street, estimated to cost about $65,000. H. M. Miller, Roanoke, Va., is architect.

The Fesenmier Packing Co., Madison Avenue and Fourteenth Street, Huntington, W. Va., will remodel a local building for a new ice-manufacturing and cold storage plant, estimated to cost about $125,000. M. L. Fesenmier is president.

The Automobile Maintenance Association, Pittsburgh, has leased the building at Penn and Pacific avenues, for the establishment of a service and repair works.

Detroit

DETROIT, Aug. 7.

The Ford Motor Co., Highland Park, Mich., will take bids this month for its proposed one and two-story plant at Flat Rock, Mich., for the manufacture of plate glass for windshields and other service in connection with its automobile production. The works will cost in excess of $1,000,000 and will include a power house and other buildings. Albert Kahn, 1000 Marquette Building, Detroit, is architect.

The Egyptian Portland Cement Co., Fenton, Mich., has leased the former car shops of the Grand Trunk Railroad at Port Huron, Mich., and will remodel the buildings for new works. It is planned to begin operations early in 1923.

The Hupp Motor Car Corporation, 3501 East Milwaukee Street, Detroit, has construction under way on two four-

story additions, to increase the floor space by about 500,000 sq. ft., making a plant area of over 1,570,000 sq. ft. It is expected to have the structures ready for service by the end of the year.

The Brewer Mfg. Co., Inc., 1103 Front Avenue N.W., Grand Rapids, Mich., which has taken over the patent rights owned by Governor Laporte Brewer, Grand Rapids, will erect a plant this year and expects to be able to manufacture the Brewer spark plug by Jan. 1. Frank P. Allen & Son, Grand Rapids, are already working on the plans. It will be in the market for equipment and material such as screw machines, spinning machines, punch presses, electric motors, oil furnaces, hex rod cold rolled steel, rod brass, sheet brass, hex brass nuts, electrode wire, manganese wire, porcelains, porcelain cement, crude oil for furnaces, aluminum or manganese nickel, gaskets, asbestos copper lined, crude oil heating equipment and printing office equipment. Until the plant is ready for operation work will be done by contract. The officers of the company are: President, C. G. Brewer; vice-president, J. A. Brewer; secretary and sales manager, C. E. Farrington; treasurer and advertising manager, R. E. Brewer.

Chicago

CHICAGO, Aug. 7.

THE local machine tool market is dull, but the decline in demand is believed to be due to the coal and railroad strikes and a revival in activity is expected as soon as settlements are reached. The railroad lists will remain dormant so long as the shopmen's strike continues. Uncertainty as to coal supply seems to explain the increased caution of other buyers. The International Harvester Co., after buying a few machines against its inquiry, has indefinitely postponed action on the remainder of the list. The Continental Motors Co. continues to place scattered orders and the Studebaker Corporation, South Bend, Ind., has added to its recent liberal purchases, having placed 17 special lathes for turning pistons and 23 plain grinding machines. The reported purchase by the Ford Motor Co. of a site for a $10,000,000 assembling plant at East Chicago, Ind., will mean the purchase of considerable machine tool equipment, if true.

Prices remain substantially unchanged. The Rhodes Mfg. Co., Hartford, Conn., however, has announced reductions of 15 per cent on its line of small shapers and slotters. The P. Pryibil Machine Co., New York, has reduced metal spinning lathes 10 to 15 per cent.

The Atchison, Topeka & Sante Fe is expected to close soon for a 150-ton electric crane for its Albuquerque, N. M., shops. This inquiry has been before the trade for several months. The Milwaukee Sewerage Commission has bought a large overhead electric crane from the Milwaukee Electric Crane & Mfg. Co. The University of Chicago has placed an order with the Whiting Corporation for a 10-ton hand power crane for its power house. The Thomas Furnace Co., Milwaukee, Wis., has ordered a 25-ton electric reservoir ladle from the Whiting Corporation.

The Donahue Steel Products Co., Chicago, has sold a 3½-in. Ajax upsetting and forging machine to the Richmond Car Works, Richmond, Va., and a 4-in. Acme upsetting and forging machine to the Steel Car Forge Co., Elwood City, Pa. These two sales represent an aggregate outlay of about $16,000.

The Ford Motor Co. has purchased 60 acres on the Indiana Harbor Canal, East Chicago, Ind., for an assembling plant to cost $10,000,000, according to a report rom Gary, Ind. The location of the plant will enable the company at Detroit to ship parts in bulk by water to East Chicago. The tract not only has considerable frontage on the canal, but is also located on the Chicago & Indiana Southern Railroad, the Wabash, the Indiana Harbor Belt and the Elgin, Joliet & Eastern.

The Standard Metal Screen & Weather Strip Co., recently incorporated with $50,000 capital stock, with general offices at 139 North Clark Street, Chicago, has acquired 8000 sq. ft. of floor space at 3753 South Halsted Street, which will be used as a factory and assembling plant. It will manufacture all metal screens and weather strips, radiator covers, roofing, shades and awnings and window ventilators. Pending the construction of its own complete manufacturing unit, the company has arranged for the manufacture of various products on contract with the Kawneer Co., Niles, Mich. It contemplates the purchase of rolling machines, shears and brakes, although the number installed will be limited to those now on hand until business requires additional equipment. The officers are: President and general manager, Gunnar F. Nordblad; secretary and treasurer, C. Walter Keeling, and general counsel, Ferdinand J. Karasek.

The Planet Piston Corporation, Belleville, Ill., recently incorporated with $50,000 capital stock, has leased a plant and purchased equipment and is now in active operation. About 50 lathes are employed and no additional equipment will be purchased for a time. It manufactures a non-expansible aluminum alloy piston for use in gasoline engines. The officers are: President, Steven D. Hartog; vice-president, Charles Procasky.

V. Malik, 2815 South Trumbull Avenue, Chicago, has let contract for a one-story automobile repair shop, 50 x 55 ft., at 4031-35 West Twenty-fourth Street, to cost $6000.

The Sullivan Machinery Co., Chicago, has awarded a general contract for a one and two-story plant at Michigan City, Ind., to cost $1,000,000. The construction of the foundation is now in progress, the contract having been let some time ago.

M. R. Thackaberry & Son, Sterling, Ill., are erecting a one-story machine shop, 20 x 36 ft., in the rear of the Hutton Bottling Works on West Fourth Street, to be used in connection with their garage.

The Biflex Products Co., manufacturer of automobile bumpers, North Chicago, Ill., has increased its capacity 150 per cent by the purchase of a foundry adjoining its plant, which formerly belonged to the Chicago Hardware Foundry Co.

The B. C. Chatfield Iron Works has commenced the construction of a foundry, 35 x 80 ft., at Gladstone, Mich. It will make bronze and gray iron castings. B. C. Chatfield, owner of the new Gladstone company, was associated for several years with the Chatfield Brass & Iron Works at Escanaba, owned and operated by his father, O. P. Chatfield.

Fire recently destroyed the round house of the Chicago, Milwaukee & St. Paul Railroad at Bedford, Ind., with a loss estimated at $25,000.

Fire of unknown origin recently gutted the third floor of the Island Avenue plant of the Aurora Silver Plate Mfg. Co., Aurora, Ill., doing damage estimated at $75,000.

The Barnwell Mfg. Co., manufacturer of bathroom fixtures, curtain rods, etc., is installing manufacturing equipment in space which it has leased on the lower floor of the Nulyne Laboratories Building, Wildwood Avenue, Jackson, Mich.

The Danley Sanitary Mfg. Co., St. John, Mich., manufacturer of sanitary feeding batteries for poultry, as well as cooling racks and other poultry equipment is building an addition, 45 x 60 ft., which will double its capacity.

The Paramount Wheel & Engineering Co. will locate a plant at Hartford City, Ind., for the manufacture of metal automobile wheels. The Chamber of Commerce of that city has purchased a site and will donate it with switching facilities to the company. Work is to be started at once on the factory, which will employ 200.

William M. Curtin and David G. Smith have opened a machine and general repair shop at 1842 East Miner Street, Desplaines, Ill.

The F. J. Lewis Mfg. Co., 2513 South Robey Street, Chicago, manufacturer of coal tar products, has purchased a 100-acre site for a factory between 108th Street, 112th Street, Avenue F and the State line. It is now building a $1,000,000 plant at Granite City, Ill., and owns works in Dover, Ohio; Moline, Ill.; Chattanooga, Tenn., as well as in Chicago.

The Star & Crescent Milling Co., South Chicago, Ill., has started the construction of a one-story power house to cost $35,000.

The J. L. Clark Mfg. Co., Rockford, Ill., manufacturer of metal cans and containers, will commence the erection of the superstructure for a one-story addition, 60 x 190 ft.

The Tomboy Mine & Milling Co., Telluride, Col., is planning to rebuild its machine shop and other departments, destroyed by fire, July 8, with loss estimated at about $50,000.

A vocational department will be installed in the new high school to be construcoted at Scribner, Neb., for which bids on a general contract are being received until Aug. 16. It will be two stories and basement, 70 x 100 ft., and estimated to cost close to $90,000. Grabe & Helleberg, Columbus, Neb., are architects.

The Common Council, Storm Lake, Iowa, will build a new electrically-operated pumping plant at the municipal waterworks, estimated to cost about $100,000, including equipment. Roy U. Kinne is city clerk.

The Hi-Power Tool Corporation, Jackson, Mich., recently organized to manufacture reamers, hobs, milling cutters and kindred specialties, has acquired the local building formerly occupied by the Jackson Machine Co., and will soon commence the installation of equipment for its proposed new plant. It is expected to begin production early in the fall. M. C. Townley is president, and Watson R. Smith, treasurer and general manager.

The Wills-Sainte Claire Co., Marysville, Mich., manufacturer of automobiles, has preliminary plans under way for the construction of an addition to its local plant. C. H. Wills is president.

The Board of Education, Saginaw, Mich., will build a one-story power house in connection with a new two-story school building on Webber Street, estimated to cost about $250,000. J. F. Beckbissinger, 114 South Jefferson Avenue, is architect.

The Universal Portland Cement Co., 210 South LaSalle Street, Chicago, Ill., has completed plans for the construction of an addition to its mill No. 7, Duluth, Minn., estimated to cost about $200,000, including equipment.

The Dubuque Electric Co., Dubuque, Iowa, will soon commence the construction of a three-story addition to its local power plant, 62 x 67 ft., estimated to cost about $300,000, including machinery.

The Electrical Engineering Co., Chicago, manufacturer of electric transformers and kindred products, has removed its plant from 922 East Forty-first Street to 2014 Wabansia Avenue, where the floor area will be increased about 200 per cent.

The Chicago, Burlington & Quincy Railroad, 547 West Jackson Boulevard, Chicago, has awarded a contract to the Home Builders, Inc., Omaha, Neb., for the construction of a new engine house, with shop facilities, at Council Bluffs, Iowa., to include a one-story machine shop and power house.

The McDougall Terminal Warehouse Co., 510 Alworth Building, Duluth, Minn., has plans under way for a new ice manufacturing and refrigerating plant on Railroad Street.

Ohio

WHILE machine tool inquiry in Cincinnati has been somewhat affected by the railroad and coal strikes, orders booked the past week showed a decided improvement over the two previous weeks. Engine lathes appear to be in good demand, several manufacturers stating that their July business was the best since 1920. The situation is spotty, however, some makers reporting satisfactory orders, with others showing a falling off compared with the month of June. One of the largest contracts the past week was placed by an Eastern electrical manufacturer for a number of milling machines. Other orders include punch presses, small planers and automatic screw machines. A local manufacturer which recently commenced building plate shearing machinery, reports the sale of two of its machines to steel plants with a third under negotiation. Railroad buying is light and a number of lists on which bids have been submitted have been held up. It is expected that the Louisville & Nashville, however, will shortly close on several tools, including a large planer. Dealers report a fair amount of orders, with inquiries still under negotiation. Used tools continue in demand, although prices on good second-hand machines are now nearly as high as on new machines of similar make.

The Henry Vogt Machine Co., Louisville, Ky., is planning the erection of an addition, three stories, 50 x 80 ft., to cost $40,000.

The Dayton Engineering Laboratories Co., Dayton, Ohio, manufacturer of Delco products, will resume the erection of an addition begun in 1920, but abandoned after the foundation was completed. It will be six stories, 190 x 350 ft., with 335,000 sq.ft. of floor space. Products now manufactured by outside firms will be made in the new building, which will also house the service department, now located at Moraine City.

The Brightman Mfg. Co., Columbus, Ohio, manufacturer of shafting machinery, bolts and nuts, has been reorganized with L. H. Brightman, president, S. D. Shearer, vice-president, and Paul A. DeLong, secretary-treasurer.

The Portsmouth Stove & Range Co., Portsmouth, Ohio, which recently awarded contract for a three-story addition, has decided to add two additional stories to take care of business expansion, which during the past year has been large. A complete enameling department will be installed in the new building.

Fire at the plant of the Motors Sheet Steel Co., Beach City, Ohio, July 20, caused a loss of about $2,500, fully covered by insurance. The fire started in the refining room where the palm oil is cooked down and burned that building, also the boiler room building, and a part of the roof over the pickling department. The fire was checked before it reached the main building or any of the other departments. None of the main machinery was damaged to any extent, but when the pipes fell connecting the sulphuric acid tank with the pickling department the company lost its complete stock of sulphuric acid, but a new supply was secured, the insurance adjusted, and the plant again put into operation Aug. 2.

The Common Sense Piston Ring Mfg. Co., according to Thomas McGeachie, chairman of the executive committee of the Heather Rubber Co., Lorain, Ohio, will lease a building for a period of three years for the purpose of manufacturing the piston ring in Lorain. The company is in the market for machinery, either new or second hand, which could be used for the purpose.

Milwaukee

THE machine-tool trade is getting no better or worse, but is undergoing constant changes, due to the uncertainties of the coal and railroad labor situation. Shops in urgent need of tools are sending in rush orders, imparting a semblance of greater activity, but volume is not showing any increase, for other shops are holding off to await developments. This includes railroads, which still postpone ordering on extensive lists of requirements. Locally, the fuel situation is steadily growing more acute and some manufacturers in the metal trades are chary about accepting new business as freely as before, which has a reflex upon the tool trade.

The Belle City Malleable Iron Co., Racine, Wis., has begun work on a plant extension project which will require a year and involve a total investment of $750,000 in new buildings, equipment, etc. The present construction represents an investment of $400,000 and is to be completed by the end of the year. A contract has been let to Nelson & Co., local, for a 260-ft. extension to the annealing building and an order has been placed with the American Dressler Tunnel Kilns Co. for annealing ovens. Part of the building also will be used for a gas producer plant. A new administration building will be erected in place of the one now occupying the site of the annealing building extension. Other details of the project will be made public later.

The Wisconsin Clay Products Co. of Kenosha, Wis., incorporated recently with $100,000 capital, has placed the contract for the entire equipment of a new face and common brick plant with a daily capacity of 100,000 brick, with E. M. Freese & Co., Galion, Ohio. The plant will occupy a site of 15 acres at Burlington Road and Howland Avenue. Joseph Orth is president, and Charles Tyson, treasurer and works manager.

The Air Reduction Sales Co., Inc., 342 Madison Avenue, New York, which announced its intention of establishing a branch plant in Milwaukee, will not immediately undertake any considerable amount of new construction, having purchased the machine shop of the Petit Mfg. Co., 1505-1515 Buffum Street. This is 60 x 120 ft., part two stories and basement, and will be remodeled to some extent, as well as re-equipped throughout. It is to be ready for operations about Nov. 1.

The Milwaukee Woven Wire Works, 3014-3020 Clarke Street, Milwaukee, has awarded contracts for a new brick and mill factory, with concrete foundation, 131 x 138 ft., part three stories. The general contractor is C. F. Behnke, 827 Thirty-fourth Street, local. With looms, motors and other equipment, the investment will be about $125,000. O. G. Marquardt is president and treasurer.

The Rockwell Mfg. Co., 572 Park Street, Milwaukee, manufacturer of hardwood finish, interior woodwork, fixtures, etc., has placed contracts for a one-story brick and mill addition, 54 x 200 ft., which will require a considerable list of wood-working machinery with individual electric motor drive. Louis C. Nuesse is secretary.

The S. E. Tate Printing Co., 133 Second Street, Milwaukee, has plans for a new four-story printing and publishing plant, 60 x 125 ft., estimated to cost $200,000 complete, and to be erected at 496-502 Broadway. Practically a new equipment of presses, typesetting machines, metal furniture, fixtures and special machinery will be installed. E. L. Arnold is president and general manager.

The Wisconsin Upholstery Spring Co., Sheboygan, Wis., has been incorporated with a capital stock of $50,000 as the successor of a partnership business established about four months ago which manufactures cushion springs. It occupies a modern building at Calumet Drive and Winter Court. J. M. Spiller and A. M. Miller continue the principal owners and managers.

The Gilson Brothers Co., Fredonia, Wis., founder and machinist and manufacturer of corn husking machines, concrete mixers, etc., will build a new gray iron foundry, 40 x 120 ft., and rebuild the present casting shop into an addition to the machine shop. It is estimated that about $40,000 will be invested in buildings and equipment.

The Biggam Trailer Co., formerly of Milwaukee, on Monday, Aug. 7, commenced initial operations in its new factory, occupying 16,000 sq. ft. in the Racine Industrial Community Building at Racine Junction, Wis. It manufactures trailers in capacities from 800 lb. to 5 tons under contract with motor truck manufacturers, rather than distributing its product among truck owners. The corporation is capitalized at $265,000 and its new officers are: President and general manager, H. F. Biggam; vice-president, George L. Buck, Racine; secretary and purchasing agent, L. E. Pitner, Racine.

The W. A. Knaak Motor Co., 1301 Georgia Avenue, Sheboygan, Wis., is erecting a $25,000 addition to its garage, service and machine shop building which will require some miscellaneous equipment.

The United Shoe Last Co. is erecting a new factory at Crystal Falls, Mich., which will represent a total investment of nearly $150,000. It consists of a main factory, 60 x 240 ft., a power plant, 30 x 50 ft., and warehouse, 58 x 400 ft.

The Chippewa Valley Auto Co., Chippewa Falls, Wis., has engaged E. J. Hancock, architect, Eau Claire, Wis., to design a new $75,000 sales and service building, 124 x 132 ft., two stories and basement. The machine and repair shop will occupy a space of 42 x 132 ft. and practically all equipment will be new. Fred A. Bigler is president and general manager.

The municipal waterworks department, Menominee, Mich., is building a two-story machine shop, 48 x 50 ft., and will buy a small list of machinery.

The Sparta, Wis., Board of Education awarded the general contract for the construction of a new high school with manual training department to Naset Brothers, local. It will cost about $200,000.

The Simplicity Engine & Mfg. Co., Port Washington, Wis., has increased its capital stock from $25,000 to $50,000 to provide additional facilities for enlarged production. Details are not yet available.

The Jenkins Machine Co., Sheboygan, Wis., which is enlarging its foundry and machine shops, has increased its capital stock by $100,000, so that the issues now consist of $200,000 preferred and $100,000 common stock.

The Central South

ST. LOUIS, Aug. 7.

The C. Hager & Sons Hinge Mfg. Co., 2427 DeKalb Street, St. Louis., manufacturer of hinges and other hardware products, is taking bids for a two-story addition, 60 x 120 ft., estimated to cost about $50,000. Helfensteller, Hirsch & Watson, Chemical Building, are architects.

The Apex Coal Co., Lynchburg, Va., is planning for the construction of a new tipple at its properties near Sergent, Ky. Other machinery, including electric equipment, will also be installed.

The Pauline Oil & Gas Co., Duncan, Okla., will build a new oil refinery on a site about six miles from Duncan, for handling about 700 bbl. of crude oil per day. It is estimated to cost about $65,000.

The Broderick & Bascom Rope Co., 4500 North Main Street, St. Louis, manufacturer of wire rope, cables, etc., will soon call for bids for two additions, one and two stories. 143 x 500 ft., and 85 x 500 ft., respectively, estimated to cost about $250,000, including equipment.

Fire, Aug. 2, destroyed a portion of the lard refining plant of Morris & Co., St. Joseph, Mo., with loss estimated at about $100,000, including machinery. It is planned to rebuild. Headquarters of the company are at Chicago.

E. B. Smith, Joplin, Mo., is organizing a company to construct and operate a plant at Purcell, Mo., for the manufacture of concrete blocks and kindred products.

The Woody Motor Co., Madill, Okla., has tentative plans for rebuilding its service and repair works, destroyed by fire, July 27, with loss estimated at $60,000, including equipment.

The Louisiana & Arkansas Railway Co., Texarkana, Ark., is taking bids until Aug. 14, for a one-story locomotive repair shop, 160 x 280 ft., at Stamps, Ark. It will cost about $150,000. Harrington, Howard & Ash, Orear-Leslie Building, Kansas City, Mo., are engineers.

The Bevis Salt Co., Lyons, Kan., has plans under way for extensions. New electric turbines and auxiliary equipment will be installed. The work is estimated to cost about $175,000.

Fire, July 26, destroyed the service building and repair shop of the Koup Motor Co., 1529-31 Oak Street, Kansas City, Mo., with loss reported at $50,000. It is planned to rebuild.

The Empire District Electric Co., Joplin, Mo., has made application for permission to construct a new hydroelectric power plant on the White and James rivers, near Branson, Mo., with ultimate capacity of 80,000 hp. The company is operated by the Cities Service Co., 60 Wall Street, New York.

The Caruthersville & Kennett Electric Light & Power Co., Kennett, Mo., has plans under way for extensions and improvements in its local electric power plant to cost about $40,000.

The Cushing Refining & Gasoline Co., Cushing, Okla., recently organized by officials of the Mulberry Oil Co., with capital of $500,000, has acquired the local refinery of Gustafson & Spencer, Inc. The new owner will make extensions and will operate in conjunction with the new gasoline producing plant to be constructed by the parent organization at Ingalls, Okla.

The Long-Bell Lumber Co., Long and Bannister streets, Kansas City, Mo., operating 13 mills in Arkansas, Louisiana, Texas and Mississippi, has arranged for a bond issue of $9,000,000, a portion of the proceeds to be used for extensions and improvements. R. A. Long is chairman of the board.

The Iddins Machinery Co., Knoxville, Tenn., will soon take bids for its proposed one-story plant for the manufacture of agricultural equipment, estimated to cost about $50,000.

The St. Louis Electric Welding Co., 2801 La Salle Street, St. Louis, recently organized, is planning for the installation of equipment in a local building, including electric welding apparatus, muffle and carbonizing furnaces, high speed welding equipment, etc. T. A. Oberchellman is secretary.

The Universal Car Co., Louisville, is planning the erection of a new one and two-story service and repair works. 100 x 225 ft., at Broadway and Twenty-fifth Street, estimated to cost about $60,000. W. C. Martin is president.

A vocational department will be installed in the two-story high school building to be erected at Roxbury, Kan., for which bids on a general contract are being asked Smith & English, Nelson Building, Hutchinson, Kan., are architects.

The Oklahoma Gas & Electric Co., Oklahoma City, Okla., is perfecting plans for a new hydroelectric generating plant on the Arkansas River, about four miles from Muskogee, Okla., estimated to cost close to $2,000,000, including machinery.

The Gulf States

BIRMINGHAM, Aug. 7.

The Kerr Tire Co., Fort Worth, Tex., has acquired a site for the erection of a new plant at Niles City, Tex., to have a daily capacity of about 2000 tires.

The American Well & Prospecting Co., Corsicana, Tex., manufacturer of oil well equipment, machine parts, etc., has plans in progress for a one-story addition, 50 x 100 ft.

Ryan & Knight, Inc., 214 West Flagler Street, Miami, Fla., has awarded a contract to John Bullen, Miami, for a three-story automobile service building, 100 x 100 ft., with machine shop for repairs and parts manufacture. S. A. Ryan is president.

The Rayville Ice Co., Rayville, La., recently organized by officials of the Consolidated Ice Co., Monroe, La., has acquired a site for a new ice-manufacturing and refrigerating plant, for which plans are being prepared. Paul Fudicker and W. W. Johnson head the company.

The Dallas Power & Light Co., Dallas, Tex., has made application for permission to build an addition to its electric power plant, estimated to cost $2,180,000. Plans have been prepared. C. E. Calder is president.

The Standard Carbon Co., Swartz, near Doss, La., will commence the erection of a new gasoline extraction plant, estimated to cost about $80,000, including machinery.

Loading and unloading machinery and other freight handling equipment will be installed in the new freight station to be constructed by the San Antonio & Aransas Pass Railway Co., San Antonio, at Waco, Tex., estimated to cost about $200,000.

The Pelsang Boat Works, Inc., Miami, Fla., recently organized with a capital of $500,000, will establish a marine construction and repair plant. Operations will commence at an early date.

The Citra Ice, Light & Development Co., Citra, Tex., is planning the erection of a new electric power plant. It will also build a new ice-manufacturing and cold storage plant, with daily capacity of about 10,000 tons.

A vocational department will be installed in the new high school to be erected at Wortham, Tex., for which plans are being prepared.

The Magnolia Oil Co., Sabine, Tex., is planning to rebuild the portion of its local distributing plant, destroyed by fire July 28 with loss estimated at $175,000.

The City Council, Vero, Fla., has plans for extensions and improvements in the municipal electric light and power plant to cost about $40,000.

Smoak & Goan, Eustis, Fla., will soon commence the erection of a one-story machine and automobile repair shop, 60 x 100 ft. A list of equipment is being arranged.

The Gould Mfg. Co., Birmingham, recently organized with a capital of $500,000, is planning the establishment of a factory to manufacture windshields and other automotive products. F. E. Gould heads the company.

Freight handling and conveying machinery will be installed in the new freight station to be constructed at Dallas, Tex., by the Atchison, Topeka & Santa Fe Railroad, 80 East Jackson Boulevard, Chicago. The first unit will be 60 x 300 ft., and will cost about $200,000; it will be supplemented by an addition to cost about $125,000.

The O. K. Ice Co., Clermont, Fla., will receive bids until Aug. 30 for an ice-manufacturing and cold storage plant, including equipment. F. B. Krieder is general manager.

A vocational department will be installed in the new three-story high school to be erected at West Palm Beach, Fla., estimated to cost about $125,000, for which bids will be received about Sept. 15. William Manly King, Palm Beach, is architect.

The Texas-Pacific Coal & Oil Co., Ranger, Tex., is planning the erection of a new gasoline absorption plant near Caddo, Tex., estimated to cost about $100,000, including machinery.

A vocational department will be installed in the new high school to be erected at Highland Park, Dallas, Tex., estimated to cost about $125,000.

California

SAN FRANCISCO, Aug. 1.

The Chevrolet Motor Co. of California, Sixty-ninth Avenue and Foothill Boulevard, Oakland, has had plans prepared for an addition to manufacture automobile bodies. W. C. Williams is manager.

The Pacific Asbestos Corporation, Oakdale, Cal., has preliminary plans under way for a new asbestos mining and manufacturing plant to include machine shop, power house and other buildings. W. A. Sutherland, president Fidelity Trust & Savings Bank, Fresno, Cal., is one of the heads of the company.

Plans have been completed for the construction of a one-story power house at the Fullerton High School, Fullerton, Cal., 40 x 112 ft. Carleton M. Winslow, 1134 Van Nuys Building, Los Angeles, is architect.

Ira G. Wagner, Sparks, Nev., is organizing a company to build and operate a new ice-manufacturing and refrigerating plant at Marysville, Cal. Negotiations are under way with the Marysville Chamber of Commerce, regarding a site.

The Public Service Commission, 210 South Broadway, Los Angeles, has had plans prepared for seven power houses, to be used in connection with local municipal service, estimated to cost about $6,000,000, including machinery. E. F. Scattergood is chief engineer.

Officials of the Shasta Lumber Co. and the Union Lumber Co., Marysville, Cal., have organized a new company to build a plant to manufacture brick and tile products. The initial works will have a capacity of about 10,000 brick per day. L. E. Hite and Calvin Smith, Marysville, are also interested in the company.

The Concrete Pipe Co., Board of Trade Building, Portland, Ore., will commence the immediate erection of a new two-story plant, 114 x 120 ft., on Page Street, estimated to cost about $25,000.

The Alaskan Engineering Commission, purchasing department, Seattle, Wash., will take bids until Aug. 16, for the following equipment, Circular 582: 100 end blocks with bolts; 50 guard rail clamps; 12 switch stands; 25 sets of split switches; 12 rigid bolted frogs; 100 rail clamps; 120 cast iron carwheels; 12 solid steel carwheels; 100 locomotive driver brake shoes; 750 boiler tubes, and other equipment.

Indiana

INDIANAPOLIS, Aug. 7.

The Inland Body Co., Indianapolis, manufacturer of automobile bodies, is planning the erection of new works at Columbus, Ind. The present business will be removed to the new location and additional equipment installed. The Columbus Chamber of Commerce is interested in the project.

The Indiana & Michigan Electric Co., South Bend, Ind., will commence foundation work at once for the erection of a new hydroelectric generating plant at Kings Landing, St. Joe River, estimated to cost about $1,500,000, including machinery.

Fire July 30 destroyed the plant of the Salem Stone Co., Bedford, Ind., including machinery, with loss estimated at $400,000. The engine house of the Chicago, Milwaukee & St. Paul Railroad, on adjoining site, was partially destroyed by the same fire, with loss of about $25,000. The Salem company is operated by the Indiana Quarries Co., which proposes to rebuild.

The Indiana General Service Co., Muncie, Ind., has arranged for a bond issue of $3,322,000, a portion of the proceeds to be used for extensions and improvements in power plants and system. R. E. Breed is president.

D. R. Ulmer, Terre Haute, Ind., has organized a company to establish a plant to manufacture sewer pipe, conduit and kindred products. The initial works will have a daily capacity of about 3000 tile lengths and blocks. Ernest Cox is manager.

The Kentucky Tire Pump Co., Madisonville, Ky., has arranged for the removal of its business to Evansville, Ind., where an enlarged works will be established.

A vocational department will be installed in the new high school to be erected at Terre Haute, Ind., for which a site has just been acquired at Twenty-fifth and Poplar streets, estimated to cost about $700,000. Johnson, Miller & Miller, 30 North Fifth Street, are architects.

The United States Quartermasters' Depot, Jeffersonville, Ind., will establish a new brass foundry in connection with its local plant. A portion of one of the existing buildings will be used.

The Olin Sales Co., 515 North Meridian Street, Indianapolis, Ind., has plans under way for a new three-story automobile service and repair works, 60 x 195 ft., at 720-22 North Meridian Street, estimated to cost $150,000.

The Ford Motor Co., Highland Park, Mich., is reported to be considering a site at Alexandria, Ind., for the construction of a branch plant. A local committee has been formed, headed by Dee R. Jones, city attorney, to arrange details. It is said that the plant will cost in excess of $200,000.

The Indiana Service Corporation, Fort Wayne, Ind., will make extensions and improvements in its local power plant to cost about $250,000, including buildings and equipment.

Canada

TORONTO, Aug. 7.

THE demand for machine tools continues about the same as in the past three or four weeks. Buyers have not commenced to enter the market with big lists and the greater part of the demand is for one or two tools. Notwithstanding that many new manufacturing plants are under construction, interests behind these undertakings are withholding orders as long as possible, but dealers look for the development of considerable activity early next month. The automotive industry is about the most consistent buyer, but purchases are chiefly for replacement. Wood-working equipment is in active demand and manufacturers report a steady inflow of orders. The demand for small tools continues good and order books are rapidly filling up, both for spot and future delivery. Prices in some districts are unsteady and price cutting is again being resorted to. No definite announcement has been made, however, regarding new lists.

The fuel situation is also having some effect on demand. The shortage of fuel is causing some concern to companies having small supplies on hand and unless some provision is made whereby coal can be secured it is likely that many will find it necessary to greatly curtail operations if not close down entirely. In some districts the supply of electric power is short and industrial plants in these localities have been forced to cut down operations.

The general contract for an addition to the plant at Leaside, Ont., for the Durant Motors of Canada, Ltd., Royal Bank Building, Toronto, to cost $750,000, has been awarded to Norman McLeod, Ltd., Kent Building, Toronto.

The sawmill at Thompson River, B. C., owned by the Northern Construction Co., Kamloops, B. C., was destroyed by fire with a loss of $100,000.

The Town Council of Montreal North, Que., will build an addition to the waterworks plant to cost $125,000. F. C. Laberge, 30 St. James Street, Montreal, is engineer.

Plans are being prepared for the erection of a paper mill at Hartville, N. S., for the Premier Paper & Pulp Co., 91 Hollis Street, Halifax, N. S. George F. Hardy, New York, is architect.

The Algoma Steel Corporation, 503 Queen Street East, Sault Ste. Marie, Ont., proposes to erect a heat treating plant at a cost of $50,000.

The Kingston Road Lumber Co., Ltd., 828 Kingston Road, Scarboro Junction, Ont., will build a planing mill and purchase equipment at an early date.

The Linde Canadian Refrigeration Co., St. Peters Street, Montreal, will build a factory at Lachine, Que., to cost $40,000 and has let the general contract to Arthur Leduc, 351 Christopher Colomb Street, Montreal.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossbile to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

	Per Lb.
Bars:	
Refined iron bars, base price	2.73c.
Swedish bars, base price	7.00c.
Soft steel bars, base price	2.73c.
Hoops, base price	3.78c.
Bands, base price	3.38c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	2.83c.
Channels, angles and tees under 3 in. x ¼ in., base	2.73c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	2.73c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	2.83c.
Toe-calk, ½ x ⅜ in. and larger	3.50c.
Cold-rolled strip, soft and quarter hard	6.25c. to 7.25c.
Open-hearth spring steel	4.00c. to 6.00c.
Shafting and Screw Stock:	
Rounds	3.50c.
Squares, flats and hex	4.00c.
Standard cast steel, base price	12.00c.
Extra cast steel	17.00c.
Special cast steel	22.00c.

Tank Plates—Steel

¼ in. and heavier	2.83c.

Sheets

Blue Annealed

	Per Lb.
No. 10	3.78c.
No. 12	3.83c.
No. 14	3.88c.
No. 16	3.98c.

Box Annealed—Black

	Soft Steel C. R., One Pass, Per Lb.	Blued Stove Pipe Sheet, Per Lb.
Nos. 18 to 20	4.00c. to 4.30c.	.....
Nos. 22 and 24	4.05c. to 4.35c.	4.60c.
No. 26	4.10c. to 4.40c.	4.65c.
No. 28	4.20c. to 4.50c.	4.75c.
No. 30	4.45c. to 4.75c.	.....

No. 28 and lighter, 36 in. wide, 10c. higher

Galvanized

	Per Lb.
No. 14	4.30c. to 4.60c.
No. 16	4.45c. to 4.75c.
Nos. 18 and 20	4.60c. to 4.90c.
Nos. 22 and 24	4.75c. to 5.05c.
No. 26	4.90c. to 5.20c.
No. 27	5.05c. to 5.35c.
No. 28	5.20c. to 5.50c.
No. 30	5.70c. to 6.00c.

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
⅛ in. Butt..	—56	—40	¾ in. Butt..	—30	—13
¾ in. Butt..	—61	—47	1½ in. Butt..	—32	—15
1-3 in. Butt..	—63	—49	2 in. Lap....	—27	—10
3½-6 in. Lap.	—60	—46	2½-6 in. Lap.	—30	—15
7-8 in. Lap..	—56	—34	7-12 in. Lap.	—23	— 7
9-12 in. Lap.	—55	—33			

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	3.50c. to 3.75c.
Annealed soft	3.50c. to 3.75c.
Galvanized annealed	4.25c. to 4.50c.
Coppered basic	4.00c. to 4.25c.
Tinned soft Bessemer	5.50c. to 5.75c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	18¾c. to 19¾c.
High brass wire	19¼c. to 20¼c.
Brass rod	16¼c. to 17¼c.
Brass tube, brazed	25⅝c. to 26⅝c.
Brass tube, seamless	22½c. to 23 c.
Copper tube, seamless	24¾c. to 25 c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 21¾c. to 22¾c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14-20	
	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	Primes	Wasters
			80 lb.. $6.05	$5.80
			90 lb.. 6.15	5.90
			100 lb.. 6.25	6.00
IC..	$10.00	$8.50	IC.. 6.40	6.15
IX..	11.50	10.00	IX.. 7.40	7.15
IXX..	13.00	11.25	IXX.. 8.40	8.15
IXXX..	14.25	12.50	IXXX.. 9.40	9.15
IXXXX..	16.00	14.00	IXXXX.. 10.40	10.15

Terne Plates

8-lb. coating, 14 x 20

100 lb.	$7.00
IC	7.25
IX	7.50
Fire door stock	9.00

Tin

Straits, pig	35c.
Bar	42c. to 46c.

Copper

Lake ingot	15¼c.
Electrolytic	15 c.
Casting	14¾c.

Spelter and Sheet Zinc

Western spelter	8 c. to 8½c.
Sheet zinc, No. 9 base, casks	8¾c. open 9¼c.

Lead and Solder*

American pig lead	6¾c. to 7c.
Bar lead	8c. to 8½c.
Solder, ½ and ½ guaranteed	25c.
No. 1 solder	23½c.
Refined solder	20¼c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	75c.
Commercial grade, per lb	35c.
Grade D, per lb	25c.

Antimony

Asiatic	6½c. to 7c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb	25c. to 27c.

Old Metals

Business is fairly good and the market is strong. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	11.75
Copper, heavy wire	11.25
Copper, light and bottoms	9.00
Brass, heavy	6.25
Brass, light	5.25
Heavy machine composition	8.50
No. 1 yellow brass turnings	6.50
No. 1 red brass or composition turnings	7.75
Lead, heavy	4.50
Lead, tea	3.50
Zinc	3.25

THE IRON AGE

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ESTABLISHED 1855

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Steps in Stamping a Draw-Bolt Tube

Single Stamped Part Replaces Complicated Assembly—Cost Lowered and Design Improved—Methods of Manufacture Outlined

BY N. T. THURSTON*

WITH a view to reducing costs and improving construction the draw-bolt tube used on a widely known fireproof safe was recently re-designed, a single stamped part being devised to replace the former comparatively complicated assembly. A saving of 18 cents per piece resulted, as well as an improvement in that part of the construction of the safe.

The single stamped part is shown above, the components of the previous draw-bolt tube employed being shown in Fig. 1. The draw-bolt tube is used as a sleeve into which the bolts on the door of the safe slide, when the door is closed and the bolts thrown.

There were two principal reasons for re-designing the old draw-bolt tube. The first was the fact that the bracket, having to be fastened to the front plate of the safe, served as a ready means for conducting outside heat to which the safe might be exposed in case of fire, direct to the draw-bolts themselves, causing them to freeze fast to the sleeves. The second reason was the matter of expense. In the single stamped tube the manufacturing expense was ten cents per piece less than in the old style, and the labor expense in getting the assembly together and in place in the safe, ready to install, was eight cents less per piece. This gave a total saving of 18 cents per piece. As to weight, the old style draw-bolt tube was about six times heavier than the new stamped tube.

The old tube was constructed of two pieces of seamless steel tubing as shown in Fig. 1, the one

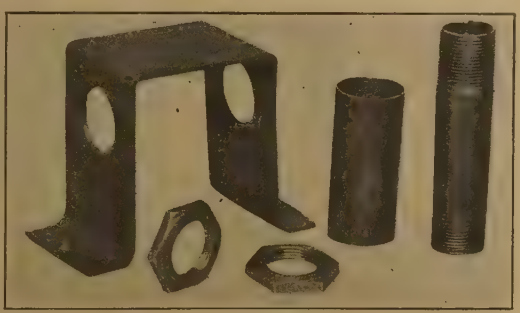


Fig. 1. Components of Draw-Bolt Tube Formerly Employed

*Acklin Stamping Co., Toledo, Ohio.

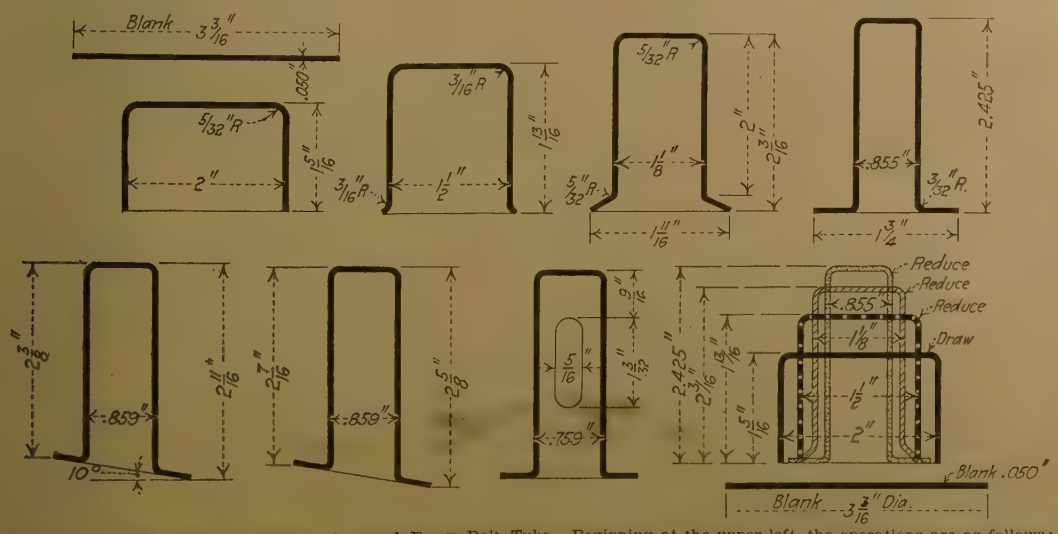


Fig. 2. Successive Steps in Making Stamped Draw Bolt Tube. Beginning at the upper left, the operations are as follows: 1, Combination; 2, 3, 4, reduce; 5, finish shape; 6, trim, and 7, slot. The layout to determine the approximate number of drawing operations is shown at the lower right

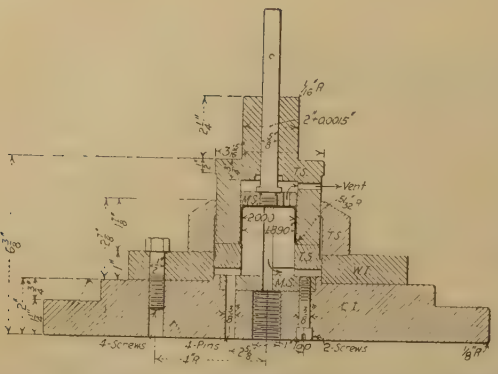


Fig. 3. Details of the Combination Die. As the punch descends the blank is cut, the punch continuing down and forming the metal around the plug

threaded on both ends and slipping inside the larger tube. Both tubes were set in position opposite the holes in the bracket and the nuts screwed up on both ends of the inner tube thus clamping the tubes to the bracket. To insure a smooth and uniform surface inside the center tube it was reamed. The assembly was then ready to be put in place on the safe and spot welded.

In manufacturing the stamped tube a good grade of drawing steel was used. This steel was furnished 3¾ in. in width and 0.050 in. in thickness and was pickled and oiled. Only two annealing operations were found necessary. The method for determining the approximate number of drawing operations necessary to bring the piece to size ready for trimming and shaping the flange at the bottom and cutting the slot in the side is shown in Fig. 2. The first operation was to cut the blank and form it around the punch to the shape shown, the blank being cut 3 3/16 in. in diameter and drawn to a length of 1 5/16 in. and to a diameter of 2 in. This work is done on the combination die shown in Fig. 3. The die is mounted on a cast-iron base and the punch turned up from a 4¼-in. bar of tool steel, the die being composed of a tool-steel cutting edge forged to a wrought-iron base with the tool-steel plug located in the center. A tool-steel draw-ring rides on the tops of four cold-rolled pins, ⅜ in. in diameter, which in turn rest on rubber buffers placed under the die.

As the punch descends the blank is cut from the strip steel, as it is fed across the die, the draw-ring holding the blank firmly against the punch which continues on down and forms the metal around the plug. On the up stroke of the ram the compressed rubbers force the draw ring to follow up the punch. At the top of the stroke the positive knock-out pin forces the cup out of the punch and it drops loose on the top of the die, to be knocked off by the operator. The vents in both the punch and the die allow the air confined on both sides of the cup to escape, preventing the stamping from buckling and tearing. A Bliss press No. 74½ was used to do this work.

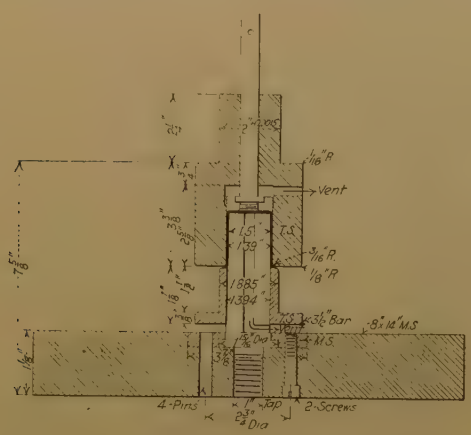


Fig. 4. Die Used in Second Operation. The length of the cup is increased ½ in. and the diameter decreased by the same amount. Before this operation the cup is annealed and washed

To prepare it for further drawing the cup is thoroughly annealed to a cherry red, which releases all internal strains in the metal. It is previously wet in a solution of one part of muriatic acid and five parts of water, the purpose of this being to loosen the scale which invariably forms on the steel due to oxidation while red hot.

The next operation, done on a Bliss No. 84 press, increases the length of the cup ½ in., that is, from 1 5/16 in. to 1 13/16 in., the diameter being at the same time decreased ½ in., from 2 in. to 1½ in. The die for this work is shown in Fig. 4. This tool is mounted on a machine steel base 8 by 14 in. and the punch, plug, and draw-ring are of tool-steel hardened and ground. The operation of the die is similar to that of the previous one, the descending punch forcing the draw-ring down with it, thus compressing the rubbers under the die. On the up stroke of the ram the draw-ring follows the punch on its upward course and at the top of the stroke the knock-out pin forces the cup out of the punch. Immediately before this operation the stampings are washed in a soap and water mixture, which serves two purposes. First it removes all scale not removed by tumbling the annealed cups, and second, it serves to lubricate the cup, thus facilitating the drawing operation. The presence of scale is detrimental to the dies, causing them to wear unnecessarily. Vents are provided in the punch and plug as in the die used in the previous operation.

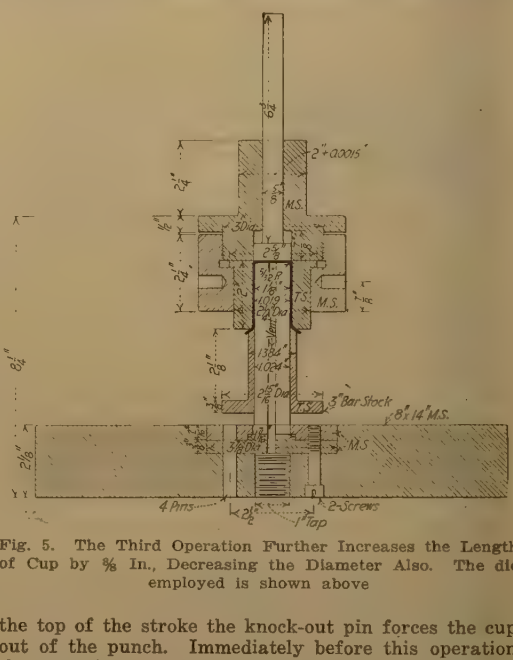


Fig. 5. The Third Operation Further Increases the Length of Cup by ⅜ In., Decreasing the Diameter Also. The die employed is shown above

The third operation still further increases the length of the cup by ⅜ in., decreasing the diameter by the same amount. The die, shown in Fig. 5, is mounted on a machine steel base, and the forming parts are tool steel, hardened and ground. The construction of the punch is a little different from that usually employed. In this design tool steel is used only where needed. The machine-steel punch holder is in two parts which when screwed together hold the tool steel punch in place. The principal reason for this type of construction is that in hardening the punch it is less likely to crack than if it were fastened to the machine punch holder by means of screws, screw holes being a flagrant cause of spoiling tool steel during hardening. This work was also done on a Bliss No. 84 press, and the operation of the die the same as those described.

At this point the stamping goes through a second annealing, the process being the same as the first.

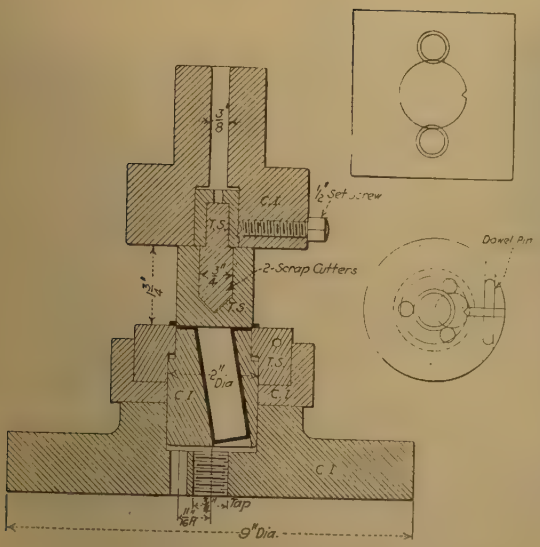


Fig. 6. Die Employed in Trimming Operation, Which Leaves the Base of the Tube with Proper Width of Flange. Plan of punch and die are shown in insert

A Bliss press No. 84 is used for this operation, which lengthens the tube ¼ in., decreasing the diameter by the same amount and forming the flange at the base perpendicular to the sides of the tube. The construction and operation of the die, is similar to the two preceding ones.

Bringing the tube to size, both as to its diameter and to the angle at the base in relation to the sides of the tube, is accomplished in the fifth operation. The die employed is mounted on a machine-steel base, the punch being constructed as previously described, in order to lessen the likelihood of its being spoiled during hardening and also to economize on the amount of tool steel used. The knock-out pin is screwed in the plug to keep it from shifting out of position.

The next step, the sixth operation, is a trimming one and leaves the base of the tube with the proper width flange. The die used is shown in Fig. 6. It is carried on a special cast-iron base, the punch being also of cast iron, into which is fitted a tool-steel cutting edge held in place by a ½ in. set screw. On the opposite sides of the cutting edge are located two tool-steel cutters, which cut through the trimmed-off scrap

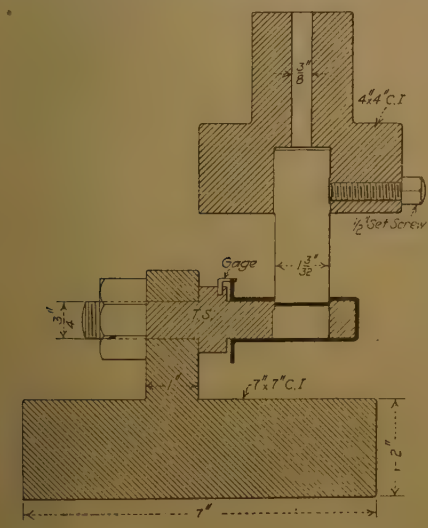


Fig. 7. The Final Operation Is Cutting the Slot in the Side of the Tube, the Die Employed Being Shown Above

rings that accumulate around the punch. The cutting edge of the die is of tool steel, held in a cast-iron matrix. This work was done in a Toledo No. 5 press. The notch in the flange is used to gage the stamping in the slotting operation which follows.

The final operation is to cut the slot in the side of the tube which is done on a Toledo No. 5 press, using the tool shown in Fig. 7, the tool being carried on a cast-iron base which holds the tool-steel plug. The punch is of tool steel and is held in the cast-iron holder by means of a ½ in. set screw. The slugs fall out as the tube is pulled off the plug, after each operation of the press. The purpose of the slot, as seen from the illustration, is to permit connecting the draw-bolt mechanism to the draw-bolt itself, which provides the means for throwing the bolts out and in the sleeves. A hole is drilled and tapped into the side of the draw-bolt, a screw run into the hole and the throw mechanism fastened to the screw. The simplicity and effectiveness of this design is apparent.

The average production of all the operations throughout a run of 100,000 finished pieces was about 5000 a ten-hour day. The dies illustrated and described were designed and operated by the Acklin Stamping Co., Toledo, Ohio.

Improvement in Unemployment

HARRISBURG, Pa., Aug. 15.—Although a number of iron and steel plants of Pennsylvania are in imminent danger of being forced to close down because of a shortage of fuel, a slight improvement in employment conditions was reported during the last half of July, according to the semi-monthly report of the Pennsylvania Department of Labor and Industry just issued.

A total of only 18,450 iron and steel workers was reported without employment on Aug. 1, as compared to 20,050 without work on July 15 and 25,500 on July 1. The decrease approximates 8 per cent.

Four of the eleven employment districts of the State reported more men without employment in the metal and steel trades than during the preceding fortnight; two, Philadelphia and Harrisburg, reported fewer men without employment; four reported no change; and the eleventh office, Reading, has just been reopened and so no report is available for the preceding period.

Unemployment conditions throughout the State as a whole, exclusive of the mine trade and the railroad shops, showed a slight improvement during the same period. The 11 offices reported approximately 92,000 without work on Aug. 1 as compared to 101,000 reported unemployed by the 10 offices on July 15. There are still large numbers of railroad shopmen and miners on strike, and the unsettled conditions in these two trades has made itself felt adversely in the iron and steel trades.

The Gartland-Haswell Foundry Co., Sidney, Ohio, although ready for operation the latter part of 1920, did not open until recently owing to the long depression. Its first heat was taken a short time ago. The plant is running about 25 per cent of its capacity of 50 molders per day on automobiles, farm implements and washing machine gray iron castings. The officers of the company are: M. F. Gartland, president; Frank X. Gartland, vice-president; John C. Haswell, treasurer; W. J. Gruss, sales-manager; M. B. McKee, secretary and manager; G. R. Wood, factory superintendent. This foundry is affiliated with 14 other gray iron and malleable castings plants in the Central West, which are controlled by the Gartland-Haswell-Rentschler foundry interests.

The British Empire Steel Corporation, Sydney, N. S., office reports that 12 steamers are engaged in the export of iron ore from Wabana, Newfoundland, to Germany, via Rotterdam. About three quarters of a million tons will have been exported before the end of the year. These shipments are being made on an order the British Empire Steel Co. received a couple of months ago for 4,000,000 tons to be exported to steel companies in Europe.

Stainless Steel at High Temperatures

Heat Treatment Which Produces the Greatest Strength for Use in Valves of Internal Combustion Engines

BY H. J. FRENCH*

STAINLESS steel, containing about 0.3 per cent carbon and 13 per cent chromium, has been successfully used at high temperatures, notably in valves in internal combustion engines. Quite probably more extended application will be made

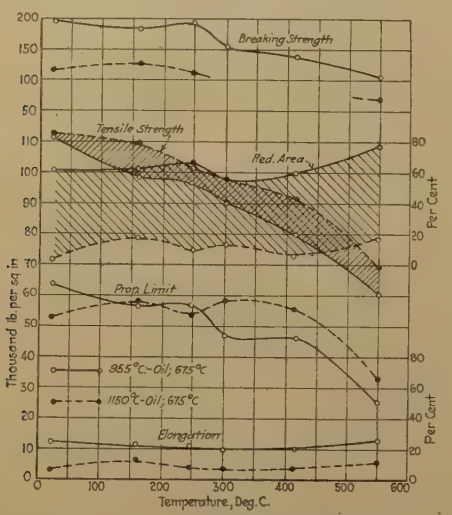


Fig. 1.—Tensile Properties at Elevated Temperatures of Stainless Steel First Oil Quenched from Either 955 or 1150 Deg. C. and Tempered at 675 Deg. C.

Composition: C., 0.31; Mn., 0.24; Si., 0.05; Cr., 12.75, and P. and S. each 0.020 per cent.

* Breaking strength is taken as the load at fracture (in lb.) divided by the reduced cross section (in sq. in.).

along similar lines in the future on account of its peculiar combination of desirable properties after suitable heat treatment.

It has already been shown that the high quenching temperature which produces maximum hardness is not that which produces the best tensile properties at ordinary temperatures, i. e., best combinations of strength and ductility.† Naturally the question arises as to which of these two hardening methods is most suitable for steel which is to be subjected to high temperature service and with this in mind two series of tensile tests were made throughout the range 20 to 550 deg. C.

The steel was first oil quenched from either 955 or 1150 deg. C. and subsequently tempered at 675 deg. C. The first of these methods of hardening produces excellent combinations of strength and ductility whether or not the steel is subsequently tempered, while maximum hardness is produced with moderately rapid cooling from the range around 1150 deg. C. A single and relatively high tempering temperature was chosen in order that

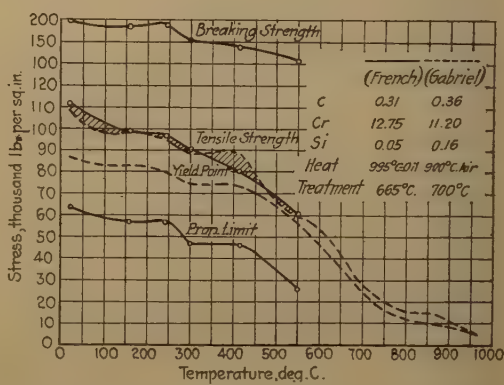


Fig. 3.—Strength and Elastic Properties of Stainless Steel at Various Temperatures as Reported by Both Gabriel and the Author. Breaking strength is taken as the load at fracture (in lb.) divided by the reduced cross section (in sq. in.)

*Physicist, Bureau of Standards, Washington. Published by permission of the bureau.

†French and Yamauchi: The Heat Treatment of a High-Chromium Steel, *Jour. S. A. E.*, VII, No. 1, p. 103 (July, 1920).

Table I—Comparison of Tensile Properties at Various Temperatures of Stainless and Carbon Steels

1	2	High Temperature Properties of Various Steels Compared to Normalized 0.32% C. Steel. (Values represent per cent increase (+) or decrease (—) from figures given in column 2)		
	Properties of Normalized Carbon Steel (0.32% C.; Air Cooled from 850° C.)	Quenched and Tempered Carbon Steel (0.33% C.; 840° C. Water; 540° C. Air)	Cold-Rolled Boiler Plate (0.25% C.; Reduced ½ In. from ½ In. Thickness)	Heat-Treated Stainless Steel (0.31% C.; 12.75% Cr.; 955° C. Oil; 675° C. Air)
Tensile strength, lb. per sq. in.				
At room	74,350	+ 34	+11	+ 50
At 300° C.	83,160	+ 25	+ 4	+ 8
At 550° C.	31,880	+ 41*	+47*	+ 90
Prop. limit, lb. per sq. in.				
At room	43,400	— 5	+30	+ 46
At 300° C.	25,750	+ 61	+18	+ 83
At 550° C.	9,375	+ 28*	+92*	+175
Elongation in 2 in., per cent				
At room	35.3	— 23	—39	— 31
At 300° C.	27.5	+ 29	—23	— 28
At 550° C.	44.0	.....	.....	— 40
Reduction of area, per cent				
At room	57.4	+ 18	— 3	+ 6
At 300° C.	30.3	+114	+50	+ 83
At 550° C.	87.8	.....	.....	— 13

*Values obtained by extrapolation of curves from 470 deg. C.

the test results might be of widest interest as tempering below operating temperatures (which may be high) would of course result in quick softening of the metal when first placed in service.

It is at once evident from Fig. 1 that the higher quenching temperature (1150 deg. C.) produces metal generally about 10,000 lb. per sq. in. stronger at high temperatures than that similarly quenched from 955 deg. C. However, this small increase is obtained at the expense of a very large proportion of the ductility. Elongation has decreased about half and reduction of area has dropped from values between 60 and 80 per cent to less than 20 per cent throughout the entire range considered.

An even more striking illustration of the deleterious effects of the high temperature quench is shown in examination of fractures, two series of which are reproduced in Fig. 2. Coarsely crystalline breaks are obtained with little or no elongation such as is observed in the series first quenched from 955 deg. C. The latter likewise show much finer structures.

Unlike carbon steels which are strongest and at the same time most brittle around "blue-heat" (300 deg. C.) the strength of stainless steel decreases steadily with rise in temperature. Confirmation of this can readily be obtained from the work of other investigators as shown in Fig. 3. However, comparison with the properties of carbon steels in normalized, cold rolled and quenched and tempered conditions (Table I) shows some decided advantages for stainless steel.

It has very much higher strength and limit of proportionality in the range about 550 deg. C. where most carbon and structural alloy steels show a decided "weakening"; at the same time it retains good ductility. However, its advantages at lower temperatures, between 20 and 300 deg. C., over quenched and tempered carbon steel of similar carbon content are not so marked.

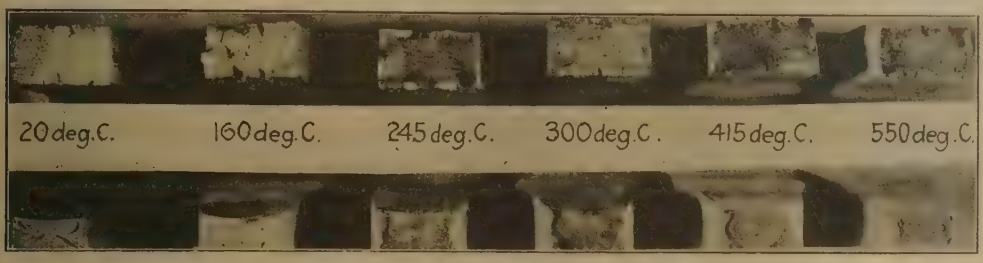


Fig. 2.—Fractures of Stainless Steel Broken in Tension at Various Temperatures
Top row: Oil quenched from 1150 deg. C. and tempered at 675 deg. C.
Bottom row: Oil quenched from 955 deg. C. and tempered at 675 deg. C.
Each pair of samples broken at temperatures indicated.

Proposed Duties on Manganese and Tungsten

WASHINGTON, Aug. 15.—Declaring that the United States Senate in its tariff making has adopted one system for one commodity and another system for another commodity, Senator Pomerene of Ohio in the Senate last week called attention to the proposed duties on manganese and tungsten.

The discussion was on the subject of potash, which Senator Pomerene declared should come in free for the agricultural interests in the country, stating that it has not been demonstrated that sufficient quantities of potash are produced in this country to make it commercially profitable. "The same situation," he said, "exists as to ferromanganese, tungsten and other alloy metals. I think it was perfectly clear from the debates on the floor of the Senate that such manganese and tungsten as we had, as well as other alloy ores, are low grade ores. There is a very great deal of uncertainty as to whether they can ever be produced from our deposits in commercially profitable quantities. The question that occurred to me is this:

"Why do you adopt the policy of a tariff to encourage the production of manganese and tungsten, and then, when it comes to potash, discard the protective theory entirely and adopt the bounty system of encouraging production? If the one scheme is advisable as to the ores that are used for alloys, why not in the other; or, if the bounty system is advisable when it comes to potash, why not as to the other?"

Senator McCumber answered that the proposed duty on potash is for the protection of the American industry. Senator Pomerene said further:

"It was conceded here in the course of the argument, I think, that the duty on the alloys would add $10,000,000 per year to the cost of steel to the consumers. I think those figures were generally admitted. I do not think it has been demonstrated that you have deposits in this country from which manganese or tungsten can be produced in commercially profitable quantities. Of course, I have no personal knowledge on this subject, and I am dependent on what the steel people say with regard to it. They are convinced that such deposits do not exist, or, at least, that they have not been discovered in such quantities as will justify an attempt to produce them in this country."

General Refractories Co. Absorbs Three Other Companies

Announcement has been made of the absorption by the General Refractories Co. of the Pennsylvania Fire Brick Co. with works at Beech Creek, Pa., the Hays Run Fire Brick Co., Orviston, Pa., and the Standard Refractories Co., Claysburg, Pa. These acquisitions will give the General Refractories Co. a daily capacity of approximately 900,000 refractory brick, making it the second largest producer in the country. Coincident with this development, the company has surrendered its West Virginia charter and has been incorporated under the laws of Pennsylvania. The West Virginia company was capitalized at $5,000,000 (50,000 shares of $100 par) of which $500,000 was held in the treasury for the absorption of its foreign subsidiary, the General Magnesite Co., Czecho-Slovakia. The Pennsylvania company has a capital of 180,000 shares of no par value and has issued $4,000,000 6 per cent bonds, to provide funds for refunding of current obligations, to furnish working capital and for the payment of the companies just taken over.

Fire hazards connected with industrial operations and how to eliminate and control fire dangers will be shown at a fire prevention exposition to be held Oct. 2 to 7, at the Twenty-second Regiment Armory, New York. It is proposed to show the latest developments in fire-safe construction and also to demonstrate the proper appliances to be used in fighting and preventing fire. A. E. MacKinnon, 405 Lexington Avenue, New York, is chairman of the exposition committee.

TESTS WITH SPECIAL STEELS

German Results on Various Chrome-Nickel Steels at High Temperatures

A LONG paper by Prof. H. Edert, giving the detailed results of experiments carried out at increasing temperatures on five alloy steels, appears in the issue of *Stahl und Eisen*, June 22. The steels were in the shape of 25 mm. rounds (0.984 in.) furnished by the Friedrich Krupp Co., Essen, and were tested in heat-treated condition as supplied by the works. The composition of the steels is shown in the table.

Table of Composition of the Special Steels Used

No.	Carbon, Per Cent	Manganese, Per Cent	Phosphorus, Per Cent	Sulphur, Per Cent	Silicon, Per Cent	Copper, Per Cent	Nickel, Per Cent	Chromium, Per Cent	Vanadium, Per Cent
1	0.31	0.22	0.010	0.025	0.27	0.06	1.90	1.53	...
2	0.21	0.28	0.018	0.050	0.21	0.06	4.03	1.69	...
3	0.37	0.20	0.006	0.046	0.28	0.03	0.03	2.38	0.58
4	0.12	0.49	0.006	0.048	0.36	0.05	1.49	15.8	...
5	0.28	0.48	0.008	0.048	0.09	0.08	5.76	20.6	...

The first three steels had been quenched in oil and drawn, the fourth quenched at 900 deg. in oil and drawn at 650 deg. C. in oil and the fifth quenched at 1200 deg. in oil. Tensile tests were carried out at ordinary temperature, and at 200, 300, 500, 600 and 700 deg. and in some cases at 800 deg C. Brinell hardness tests at 20, 100 and 300 deg. C. Also shock tests and bending tests were made. Details of the methods of heating the samples and carrying out the tests are given in the original paper, and the results are shown in a very interesting series of diagrams.

The low percentage chrome-nickel steels, Nos. 1 and 2, were found to be easy to work. They have a fine structure and take a good polish, and are suitable as construction materials for parts of machinery with exacting requirements where the least possible weight is required. They show great resistance against alternating stresses and shocks and also against separate heavy blows. It is recommended that in such cases the special parts be properly designed and large fillets be provided as the cross section changes. The steels can be used for temperatures up to 500 deg. C.

The chrome-vanadium steel, No. 3, is more difficult to machine than those mentioned above, but still can be worked fairly well. It has a remarkably fine structure, very suitable for wearing surfaces, and is suitable as construction material for parts with difficult requirements, because of its resistance to alternating stresses and shocks. It can be used up to 500 deg. C., but great care must be used if these temperatures rise to 600 deg. C. because the special properties given by heat treatment are lost.

The high percentage chrome-nickel steel, No. 4, is noticeable because of its great resistance to oxidation and chemical action. The test pieces carried to 700 deg. C. showed no coating of oxide. The steel can be machined with care. In regard to its hardness and other special properties, it is very similar to the low percentage chrome-nickel steels. It can, therefore, be used as construction material where the requirements are for tenacity and toughness and a considerable amount of resistance to chemical action. The temperature limit is about 600 deg. C.

The high percentage chrome-nickel steel, No. 5, has a fine nickel like color and like the other steels takes a good polish, and notwithstanding its comparatively low Brinell hardness shows considerable resistance to abrasive wear. It can be machined but with more difficulty than steels Nos. 1 to 4. It is necessary to increase the speed of turning or sawing or else to use harder tools. This steel is very susceptible to changes of shape, because of its plasticity. At a clear red heat it can be forged something like tool steel and in the cold condition is comparatively easily shaped by drawing, pressing or stamping.

The most important property of this high chrome-nickel steel is its remarkable resistance to chemical action; for instance, a polished section etched in nitric acid solution in alcohol for 5 hr. was not sufficiently attacked to show the microstructure. Hydrochloric acid (1 per cent) in alcohol was necessary for 1 to 2 hr. This steel withstands high temperatures better than the other steels and annealing for 8 hr. at 100 deg. C. shows very little surface attack. Polished sections and other test pieces can be left without care in the laboratory for a year without being attacked. It can be used for parts of machinery, if consideration is given to the low elastic limit and the parts made correspondingly larger. It is suitable for places where resistance to rust, ability to take a high polish, resistance to sea water or other corrosive agents, or to high temperatures are required. It cannot be magnetized, is plastic and shows very great resistance to the formation of cracks.

G. B. W.

Large Lathe for Chilled Rolls

A large roll lathe built recently by the Reading Iron Co., Scott Foundry dept., Reading, Pa., is shown in the accompanying illustration. It has a capacity for turning a chilled roll 42 in. in diameter by 120 in. length of body. It is driven by a 20 hp. variable-speed motor, the speeds of which range from 400 to 1600 r.p.m.

The main spindle bearing is 7¾ in. in diameter and all gears are machine cut. The face plate speed is four-tenths of a revolution to one and six-tenths revolutions per minute. Bearings are liberally proportioned and the entire construction embodies the strength needed for the heavy service for which the machine was designed. The total weight of the lathe shown is 35,000 lb.

Enough recoverable bituminous coal to meet the demands of the next 290 years, at present rate of consumption, lies in the Pennsylvania fields, according to a report of the State Bureau of Topographic and Geological Survey. The figure is given as 43,830,860,000 net tons, after deducting from the total known capacity of the fields the unrecoverable coal and waste. The amount already mined is put at 5,519,775,000 tons.

Lathe for Turning Chilled Rolls. The capacity is for rolls 42 in. in diameter by 120 in. length of body. A 20-hp. motor is used

METAL SCHEDULE

Little Change Probable in Final Consideration of the Tariff Bill

WASHINGTON, Aug. 15.—The metal schedule of the tariff bill probably will be changed little, if any, from its present form, when the measure is voted on by the Senate Saturday of the present week. Beginning this afternoon, the Senate started to vote without further debate on all committee amendments not disposed of, and at not later than 10 p.m. Thursday it will vote without further debate on all pending individual amendments. When the bill is brought to a final vote in the Senate on Saturday, in accordance with a unanimous consent agreement, it will have been before that body exactly four months. Discussion of the metal schedule occupied about six weeks of this time. It has been changed considerably, particularly with regard to certain raw products and the ferroalloy section, by the Senate as a whole, when compared with the form in which it was reported by the Committee on Finance. The most important changes have related to the transfer of manganese ore from the free to the dutiable list and sharp increases in the duties on ferromanganese, magnesite, and a small increase in the duty on fluorspar. The metal schedule as a whole now does not differ much from the schedule as it passed the House. Because of this, it is not likely that there will be much difference of opinion between House and Senate conferees on the metal schedule itself when it is sent to conference.

Work of the Conferees

The conference is to follow after the bill is sent back to the House, where the original measure was passed more than one year ago. It is the hope of Chairman McCumber of the Senate Finance Committee to have the conferees begin their work early next week. Senator McCumber has said that every effort will be made to have the measure reported out of conference within a few weeks and to have it enacted into law before the fall election campaign begins. In the event, however, that the measure is held up in conference, until a short time before election, the Republicans may prevent its passage at the present session, because of the fear of political reaction, should the measure not be given a chance to operate and to be understood before the political campaign is ended. Republicans deny emphatically that they intend otherwise to hold the measure in conference until after election.

The greatest point of contention in conference will be whether the House American valuation plan is to be discarded for the Senate plan, which provides for foreign valuation, subject to the provisions of the so-called flexible tariff amendment, which was adopted last Friday. This form of tariff is new in the annals of American tariff legislation. The question of constitutionality was raised by a number of Senators who were opposed to the plan because of what they declared is the danger of transferring the taxing power from the legislative branch to the chief executive.

Proposed Flexible Tariff

Briefly, the Senate granted authority to the President to increase or decrease the rates in the pending tariff bill until July 1, 1924. The original proposals for the establishment of a flexible tariff were considerably modified. The much mooted question of American valuation was disposed of easily in that now it will apply only to dyestuffs and coal-tar chemicals. Under the amendment adopted by the Senate, the United States Tariff Commission, in addition to the duties now imposed upon it by law, is directed to—

(1) Ascertain conversion costs and costs of production in the principal growing, producing, or manufacturing centers of the United States of articles of the United States, whenever in the opinion of the commission it is practicable; (2) ascertain conversion costs and costs of production in the principal growing, producing, or manufacturing centers of foreign countries of articles imported into the United States, whenever in the opinion of the commission such conversion costs or costs of production are necessary for comparison with conversion costs or costs of production in the United States and can be reasonably ascertained; (3) select and describe articles which are representative of the classes or kinds of articles imported into the United States and which are similar to or comparable with articles of the United States; select and describe articles of the United States similar to or comparable with such imported articles; and obtain and file samples of articles so selected, whenever the commission deems it advisable; (4) ascertain import costs of such representative articles so selected; (5) ascertain the grower's, producer's, or manufacturer's selling price in the principal growing, producing, or manufacturing centers of the United States of the articles of the United States so selected; and (6) ascertain all other facts which will show the difference in or which affect competition between articles of the United States and imported articles in the principal markets of the United States.

The import cost is defined as "the price at which the article is freely offered for sale in the ordinary course of trade in the usual wholesale quantities for exportation to the United States, plus, when not included in such price, all necessary expenses, exclusive of customs duties, of bringing such imported articles to the United States."

Penalizing Discrimination

The provision for penalizing discriminations against American trade is worthy of consideration and has been supported by iron and steel makers. The amendment provides that if a foreign country does not afford American commerce that equality of treatment which it is the American policy to grant, the President has the power to take more drastic measures and, if necessary, apply an embargo. It is necessary, however, for the President to find after investigation, that there is a discrimination. The additional duties are limited to the extent of the discrimination, but if the discrimination is maintained and continued, the importation of the merchandise may be prohibited entirely.

Considerable interest is being manifested in the appointment of the Senate conferees. While according to precedent the three ranking Republicans and the two ranking Democrats on the Finance Committee would be named, it seems likely that this custom will not be followed in the present instance. This is due to the fact that Senator La Follette of Wisconsin, a strong opponent of the tariff bill, is the third ranking Republican, and it is doubted that he will be appointed. In the event that he is not, it has been indicated that Senator Dillingham of Vermont will be named in the place of Senator La Follette.

Reductions in Pig Iron Rates from the South

WASHINGTON, Aug. 15.—Reductions in rates on pig iron from the Birmingham, Ala., district to Ohio and Mississippi river crossings are proposed in Speiden's tariff supplement filed with the Interstate Commerce Commission, to become effective Sept. 1. Carriers north of the Ohio river have not joined in any of the reductions, so that joint rates are not to be reduced and consequently the decreases in rates to consuming points north of the river arising from combinations will be due to the action of the Southern carriers only. The reductions to be made are proposed in addition to those that became effective July 1, when the general 10 per cent decrease went into operation. It had been previously intended by Southern carriers to effect joint rates with Northern lines, so as to make them applicable to consuming points north of Ohio river, such as Chicago.

The proposed reduced rates in gross tons are $3.53 to Cincinnati, Cairo, Ill., New Albany and Evansville, Ind.; $3.24 to Louisville and $4.24 to St. Louis. Previous to July 1, the rate now proposed to be $3.53 was $4.50. At present this rate is $4.05. The rate to Louisville was reduced from $4.13 to $3.71 and the rate to St. Louis was reduced from $5.74 to $5.16 when the 10 per cent cut went into effect. The through rate from Birmingham to Chicago was brought down from $6.67 to $6.01 at that time.

The Chase Metal Works, Waterbury, Conn., has added to its fleet of tractors four new towmotors, the product of the Towmotor Co., Cleveland.

Electric Motor Drive in Steel Industry

Mill Requirements for Adjustable Speed—Considerations of the Flow of Metal Under Rolling Pressure and Its Effect on Power Demands

BY GORDON FOX*

(*Concluded from page* 341, *Aug.* 10)

HAVING reviewed briefly the more general mill types, we may now consider the characteristics of the motors suited to their drive.

Mills revolving in one direction only may require either a constant speed or an adjustable speed. Continuous blooming and billet mills, sheet mills, three-high plate mills, rail, structural and merchant mills, are among

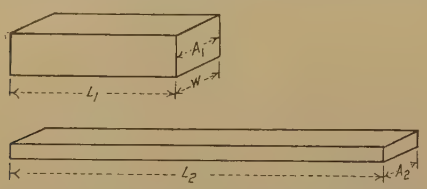


Fig. 7. Displacement Diagram for Rolling, in Which A_1 Is the Original Area, A_2 the Final Area, W the Width, L_1 the Original Length and L_2 the Final Length. The elongation E is $\frac{L_2}{L_1}$, while the draft is $\frac{A_1 - A_2}{W}$ and the volume displaced, $L_1(A_1 - A_2)$

those frequently equipped with constant speed drives. Some of the newer mills are arranged for adjustable speed where the older mills managed with single speeds. Most constant speed mills are provided with wound rotor induction motors, both because of the suitability of this type and also because alternating current power is more readily available. Flywheels are used with many of these drives. The synchronous motor offers possibilities for application on some continuous mills which run at constant speed and fairly steady load, and which cannot well utilize flywheels. But it has insufficient starting torque where it is desired to reverse or back out a cobble. It can, however, develop sufficient torque to start against mill friction and inertia, and offers some advantage as to efficiency and power factor. Dynamic braking can be employed for a quick stop, if desired.

There are many reasons for the requirement of adjustable speed for some mills. Among these are the following:

Lighter materials may usually be handled and rolled at higher speeds without straining the mill or overloading the motor. It is usually desirable to roll the lighter sections as fast as possible, not only for production, but also to prevent excessive cooling.

The skill of workmen in handling the piece between passes may limit the mill speed. As this condition is subject to change and improvement, it is desirable to be able to adjust accordingly.

Some speed adjustment may be desirable to make up for variations in roll diameters. These diameters may vary as much as 20 per cent from original to final size.

It may sometimes be desired to roll some unusually heavy orders at low speeds to minimize the strain on the mill or to limit the power peaks, particularly with purchased power.

Some qualities of steel may dictate the use of lower speeds and lower temperature of rolling.

It may be of advantage to adjust the speed of rolling to obtain a constant finishing temperature, to maintain accurate gage and section.

It may be desired to adapt the mill speed according to the heating of the furnace, or the rate of shearing.

In a roughing mill slower speeds are desirable where heavier drafts are to be taken, as the metal then enters the rolls better.

Adjustable speed is of particular advantage at the finishing rolls—commonly a limiting factor of production. If adjustable speed is not provided, the speed for all products must be that suited for the slowest.

Where two or more stands or mills are in tandem, it will usually be necessary to adjust the speed of one to suit the others. This refers especially to the roughing and finishing groups of continuous or combination mills, where the metal is in several stands simultaneously. In mills of this general type it is also of advantage to be able to vary the relative speed of roughing and finishing rolls, according to the total

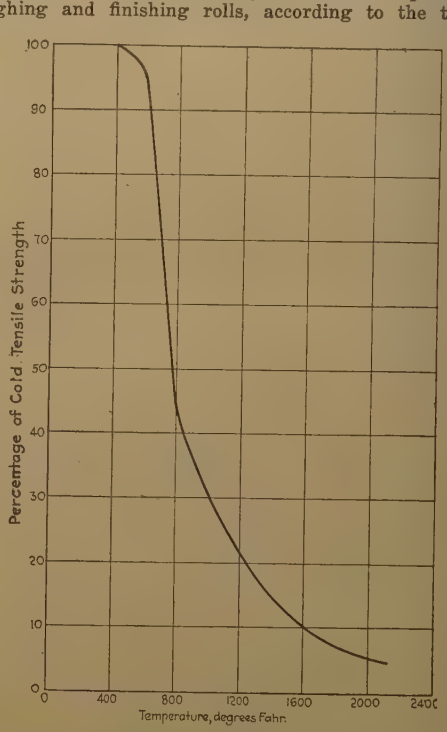


Fig. 8. Curve Showing the Variation in Tensile Strength of Steel at Different Temperatures, in Percentage of Its Cold Tensile Strength

elongation, and to apportion the reduction between the mills as desired.

An adjustable speed drive is used at the structural mill of the Inland Steel Co. at Indiana Harbor, Ind., to enable the piece to be entered at low speed and to enable the speed in the pass to be adapted to the length and section of the piece. A low entry speed is of particular benefit in rolling some structural shapes involving deep flanges.

[Here follow considerations of types of motors suited electrically to the several requirements outlined above.—EDITOR.]

*Electrical engineer Freyn, Brassert & Co., Chicago. The paper, which was read before the Western Society of Engineers, won the Robert W. Hunt prize for the best discussion of some phase of the steel industry.

When the type of mill and drive are determined, the question of motor size demands consideration. Steel mill practices are largely empirical, being based on precedent and experience. However, as mills differ, it is desirable to have some measure by which data on known conditions may be extended in its application.

Little is known as to the flow of metal in the rolling process and no precise formula for power consumption can be derived. The governing factors are understood, however, and empirical methods have been developed for their application.

The load demand of a mill is composed of three components. The friction load is considered as the demand

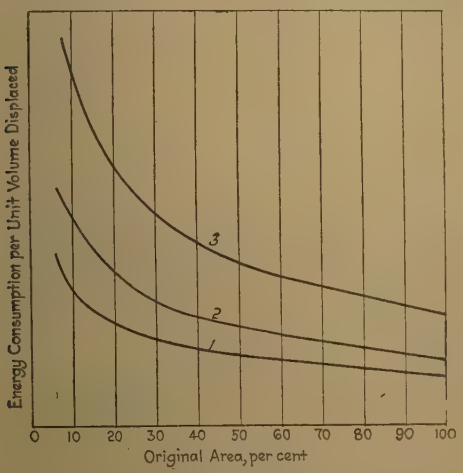


Fig. 9. Curves of Specific Power Consumption (Values of the Ordinates Were Withheld at the Source) in Which 1 Represents a Reversing Blooming Mill, 2 a Lauth Plate Mill Rolling Reheated Slabs and 3 a Billet Mill Rolling Reheated Blooms and Consisting of a Continuous Roughing Mill and a Belgian Finishing Mill

when the mill is running empty. This demand is in the nature of a constant torque with power in proportion to speed. The value of the friction load may be determined by test or approximated by comparison with similar mills. Reversing mills involve an element of inertia load due to the imparting and absorbing of the kinetic energy in accelerating and reversing the mill. This load may be calculated from weights and radii of gyration of rotating members based on a selected rate of acceleration. Flywheel effect is also an inertia load which relieves the motor as the speed drops and which adds to the motor load during acceleration periods.

The load demand incident to rolling is taken as including not only the power required for displacement of metal, but also the friction of the metal with the rolls and collars and the increased friction at the roll necks, spindles and pinions. It is evident that so inclusive a factor is not susceptible to theoretical calculation.

In rolling blooms, billets, slabs, flats, plates, strip and similar shapes, the metal is displaced almost entirely in the direction of rolling. It has been found that the power required to roll these shapes is consistent, provided similar rolling conditions maintain. In rolling special shapes in closed passes such items as side displacement, indirect pressure, collar friction and end thrust complicate the problem to such an extent that no formulæ are applicable and determinations of power must be based on precedent.

Both the volume of metal displaced and the elongation are used as the bases of formulæ for power determinations for simple rolling. It has been found empirically that the power consumed is proportional to the volume of metal displaced. Referring to Fig 7, *HP sec.* is proportionate to $L.\ (A_1-A_2)$. It has also been found that the power demand is closely proportional to the logarithm of the elongation. (*HP* is proportionate to log *E*.)

The volume displaced and the elongation in a given pass both depend upon the draft. This may be dictated by the number of passes available and the reduction desired. It is limited by the strength of the mill and by the allowable peak demand on the motor or on the power system. The possible draft is limited by the ability of the rolls to "bite." The larger the rolls the greater the draft that may be taken without exceeding the limiting angle of rolling, which corresponds to an arc of about 30 deg. on the roll periphery. The draft seldom exceeds 30 per cent, and is more commonly 15 to 20 per cent.

Some steels develop rough edges if heavy drafts are taken. The draft is often varied as rolling progresses. In rolling plate, for instance, the heavier drafts are taken on the first passes while the piece is hottest. The spring of the rolls then causes the piece to be thicker in the center. To eliminate this, the draft in the later passes must be conservative.

It is probable that, with relatively heavy drafts, the power consumption is increased by the fact that the average distance of displacement of the metal must be greater.

There are several factors which modify the power required per unit of volume displaced or per unit of elongation. Foremost among these is temperature. The power required is closely proportionate to the tensile strength of the metal. Fig. 8 shows how the tensile strength of steel varies with temperature. The usual rolling range is from 1800 to 2300 deg. Fahr. Cold rolling requires about twenty times the power of hot rolling, per unit of displacement. It is evident that the specific power consumption in the later passes may be relatively high. From the power viewpoint it is obviously desirable to roll at temperatures as high as possible.

From the viewpoint of quality of steel it is necessary to avoid too high an initial temperature; moreover, finishing at lower temperatures may give added strength. For instance, a thin plate rolled from a given slab will have greater unit tensile strength than a thick plate from the same slab, due to greater density and finer grain incident to the additional rolling and lower finishing temperature. A lower finishing temperature may also be of assistance in finishing to gage.

The quality of steel may influence its rolling power. The composition of steel does not greatly affect its strength at rolling temperatures, but high carbon and alloy steels should not be heated above 2000 deg. Fahr., for fear of burning and oxidation of alloys. They are therefore commonly rolled at lower temperatures, and thus require more power per unit displacement. The composition of the steel affects the action of the steel in rolling, rather more than the power requirement.

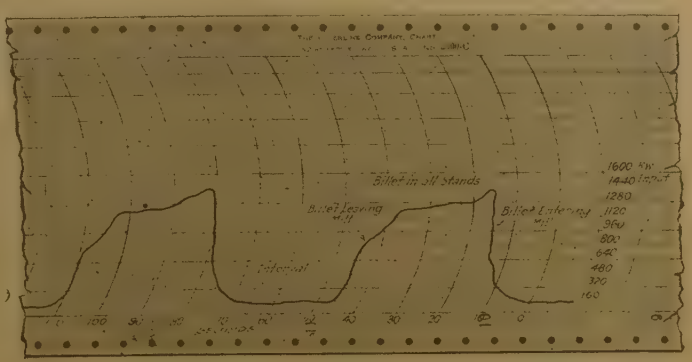


Fig. 10. Load Chart from the Continuous Roughing Mill Shown in Fig. 2 (Page 339, Aug. 10) Rolling 7¾ x 2-In. Blooms into 7⅝ x 0.315-In. Skelp

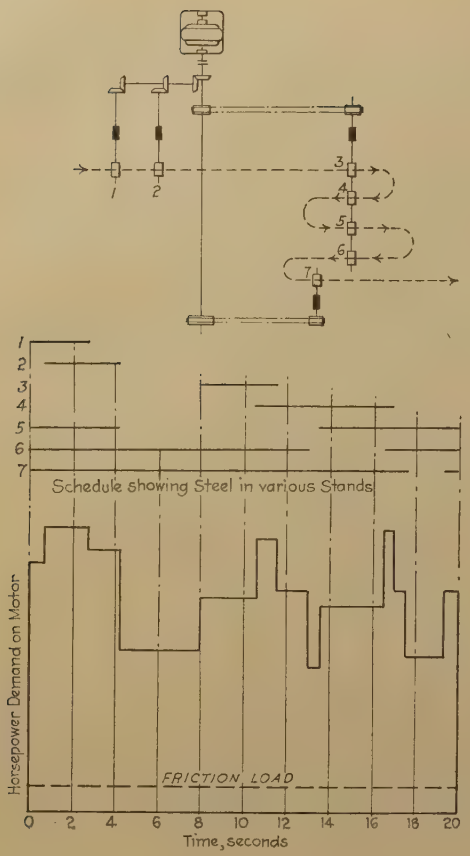


Fig. 11. Load Diagram of Combination Mill with Drive from a Single Motor. The diagram plan at top shows layout of the mill and power connections. In the middle is shown the timed schedule of steel in each of the seven stands

Some steels are hot short and the edges fray so that it is necessary to take lighter drafts and more passes.

Density of steel is a factor. The cast ingot is spongy and easily reduced. As rolling proceeds the metal becomes denser and somewhat more power is required to roll it. This action is particularly pronounced in cold rolling. The shape of the section is an important consideration, primarily with reference to the exposed area per unit of volume. Plates, for instance, expose more area than ingots and cool faster. The specific power demand therefore increases more rapidly as rolling proceeds. In the initial passes, at high temperatures, the specific power demand for different sections or pass shapes does not vary widely. In the later passes the variation is much more marked. It is characteristic of special sections, as a result of lateral displacement and forming the thin web and flanges, which cool rapidly and offer great resistance, that the power required for the later passes is relatively high.

The diameter of the rolls plays a part. A roll of large diameter requires greater pressure for a given draft because of the greater projected area of contact. The increased pressure on the roll necks increases the friction. Moreover, with a large roll there must be more slippage between roll and steel at the point of entry. Large rolls are necessary for reasons of strength and deflection, but they require more power per unit of metal displaced.

Because of the many factors involved, it is not possible to state any single value of kwhr. per unit of displaced metal to cover all conditions. Curves have been drawn from test data on various types of mills. These curves take into consideration, in a practical way, the modifying factors, particularly the rate of cooling, and serve as a guide for forecasting the requirements of proposed mills of similar character. Fig. 9 gives specific power consumption curves for a reversing blooming mill, for a three-high plate mill rolling reheated slabs and for a billet mill rolling reheated blooms.

These show, for instance, that when the piece has been reduced to about 40 per cent of its original area, the power consumed per unit displacement is roughly 150 per cent of that required for the first pass. This condition is primarily due to cooling and is therefore more marked in the case of plates and billets than with blooms, which hold their heat well. The curves are representative of zones in which fall test values from a large number of pieces. They are necessarily inexact.

The first step in the determination of motor size is the calculation of the load demand of the individual passes and the duration of each pass. The intervals between passes may be estimated, based on the character of the mill and the operation of the screw down, lifting tables or transfers, where used. Where stands or groups are operated in sequence, the slowest point determines the maximum rate of feed. The rolling schedule is based on these considerations.

With the above data available for perhaps several rolling orders, load cycle curves may be prepared by charting the loads of the individual passes and combining them where they overlap due to steel being in two or more passes simultaneously. In laying out such a chart, friction load is added, commonly considered as a constant demand. In considering load cycle charts, not only normal but possible abnormal conditions must be taken into account. The maximum possible output and probable average schedule must both be considered. The drive must have capacity to handle the maximum, at least occasionally.

If the load cycle is such that a flywheel is advisable the requirements may be determined from the chart. If a horizontal line be drawn representing maximum motor output, the flywheel must be able to supply the horsepower-seconds demand above this line. This general mode of procedure shows what effect can be obtained from flywheels of feasible dimensions. A study of the load cycle and the flywheel possibilities determines the motor requirements, both as to continuous and peak demands. Upon this information the motor selection is based.

In a continuous mill the steel enters the successive stands in rapid sequence and remains for some time in each stand. The resulting load is a sustained demand gradually applied and relieved, a most favorable condi-

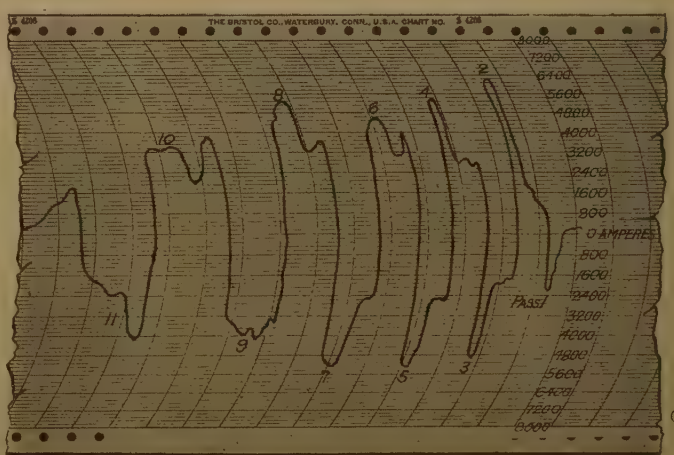


Fig. 12. Diagram of Current Supplied to Armature of a Plate Mill Reversing Motor Requiring Eleven Passes to Roll Open-Hearth Slabs 5 x 21 In. into Plate 20½ x ¼ In. The 8000-hp. motor runs at speeds up to 120 r.p.m., with current up to 600 volts. The chart speed was 6 in. per min.

tion. Fig. 10 shows the load curve of the continuous roughing stand of the 10-in. skelp mill at the Mark plant, Steel & Tube Co. of America, when rolling 7¾ x 2 in. to 7⅜ x 0.315 in. As there are no severe peaks of short duration, there is no field for a flywheel, and flywheels are seldom used for continuous mill drives. The rolling schedule on a continuous mill is quite simple and definite, so that the required motor capacity can be determined with relatively good accuracy.

In mills involving several stands in train, or in Belgian or combination type mills, the rolling schedule is less simple and the individual pass demands will ordinarily overlap in such manner as to cause a load of fluctuating nature. Fig. 11 shows the layout of a mill having two tandem roughing stands followed by a guide mill or train in which the metal is looped between stands. The schedule shows the passes and their intervals, showing at a glance how the pass loads are superimposed.

It will be noted that the finishing pass is the limiting factor. The load chart, as shown, is based on a single group drive for all the stands. If the drive

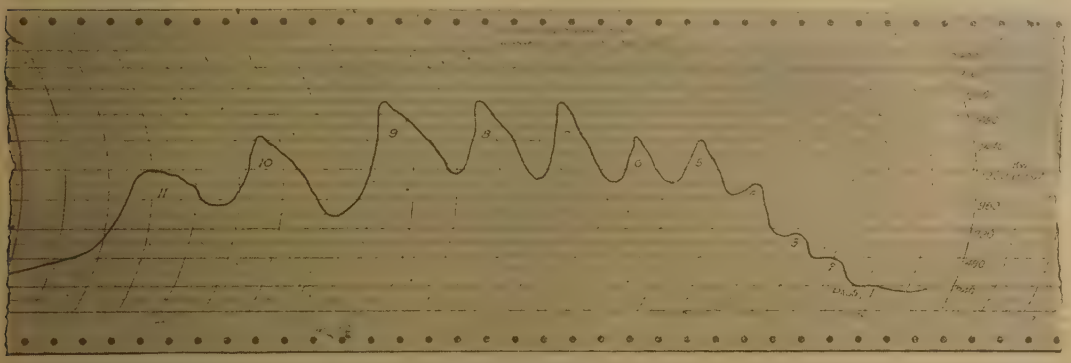


Fig. 13. Diagram of Kilowatt Input into the Ilgner Set of the Plate Mill of Fig. 12. The three-phase motor takes current at 2300 volts and delivers 1500 hp. at 360 r.p.m. The chart speed was 3 in. per min. This diagram was taken simultaneously with that in Fig. 12

were divided, the diversity factor would have less effect and the loads on the driving units would be more peaked. In a mill of this type, having separate drives for the roughing and finishing groups, it will likely be found that a flywheel may be used to advantage for the roughing drive but is not required for the finishing group.

The load on the motor driving a reversing mill involves the work done in displacing the metal, superimposed upon which is the friction load of the mill and the inertia load due to acceleration and reversal. About 30 to 40 per cent of the energy demand for a pass is for acceleration. About two-thirds of this is regained by regeneration in stopping before reversal. The nature of this load may best be seen from Fig. 12, a chart taken on the 30-in. universal plate mill at the Mark plant, Steel & Tube Co. of America, while rolling slabs 5 x 21 in. down to 0.250 x 20.5 in. The peaks due to reversal can be identified in most cases, as preceding the rolling load for each pass.

Fig. 13 shows the demand on the induction motor driving the Ilgner set. The effect of the flywheel in smoothing out the load demand is fairly evident, although more pronounced when rolling wider slabs. The load cycle of both the reversing motor and flywheel set may be computed in a manner similar to that indicated for other mill types, namely, by combining properly the component elements and by modifying for flywheel effect as selected.

In mills where passes are not superimposed, reversing mills and Lauth plate mills being examples, the power demand peaks during the first passes are high and short. The flywheel absorbs a considerable portion of this peak demand. During the later passes the peaks are lower but the demand more sustained, so that the motor then supplies about all the power required. The calculated power requirement and motor size should serve primarily as a basis of judgment. Local conditions have a bearing. Comparisons with other installations are of value, but allowances must be made. Some mills can handle the steel more rapidly from the furnace to and through the mill. The steel is finished hotter and requires less power.

Operators differ as to drafts and passes and eventually tend to demand all the motor will stand. As operating skill improves, more output is expected. It is difficult to forecast accurately the future conditions under which a mill may be expected to work. In due time any limiting factors will be improved and motor capacity may eventually limit the output. It is therefore almost imperative that the motor selected be liberal for the duty contemplated at the time of installation. To a moderate degree reliability also justifies liberal motoring.

Flywheels are installed on Ilgner sets and on continuous running drives where the load is of a widely fluctuating nature. Where the passes are of short duration and the intervals relatively long, a flywheel serves to best advantage. Where the load is fairly well maintained, a flywheel can benefit but little. A proper flywheel permits the use of a motor of lower peak capacity. Of often greater importance is the reduction of peak demands on the power system. The utilization of a flywheel requires slowing down under heavy loads. This, in turn, introduces slip losses, which are greatest at heavy loads. The slip permissible does not exceed 15 per cent, due both to low motor efficiency and difficulties in rolling with greater speed variation. The friction losses incident to heavy flywheels are an important item.

On the other hand, the increased efficiency due to better load factor at the power house may easily overbalance the added mill losses. The size of flywheel is usually a compromise. A flywheel large enough to absorb all peaks above the average load would usually be excessive in size and weight. The size of the drive in relation to the local power system has an important bearing. It is obvious that, if a flywheel is used on a drive having a range of speeds, it is less effective at the lower speeds. The selection of flywheel, motor and control should be based on their joint consideration, as they are closely related.

Motors equipped with flywheels are of the wound rotor type and employ either fixed or variable secondary resistors or a slip regulator. The use of a slip regulator affords most effective utilization of the flywheel by conserving the stored energy for use only during peaks.

Main drive motors may be direct connected to the mill or they may drive through rope, belt or gearing. Motors direct connected to the larger mills are necessarily of slow speed, many of them operating at about 80 to 100 r.p.m. Direct connected slow speed motors are of large dimensions; their efficiency and power factor are relatively low, particularly in the case of 60-cycle motors. Simplicity of drive and elimination of reduction gearing is their chief advantage.

Motors driving a group of tandem stands may drive through bevel gearing or through spur gearing or a combination of the two. Belt drives are also employed,

particularly for finishing stands, as a smoother finish is claimed, due to elimination of gear vibration. The herringbone reduction gear unit is slowly gaining in popularity. It enables the use of high-speed motors on low-speed mills. Herringbone gears are smooth in operation, eliminating largely all shock and back lash and thus relieving the teeth of much punishment. They permit wide speed ratios, if desired, and have an efficiency of about 98 per cent. The first cost of a complete geared drive is generally lower than that of a slow speed direct connected equipment, but the gear drive may require more floor space.

In the Lauth type plate mill, the central pinion in the housing may be made smaller than the upper and lower gears, obtaining a slight speed reduction. In the "Kennedy" housing the pinion is offset and larger gears are used, so that a reduction of four or five to one can be incorporated.

Many mills offer a choice between direct connection and drive through a gear unit. In some cases, notably in the sheet mill, the speed is so low that direct connection is not feasible and herringbone gearing is commonly used, so that a motor of about 240 r.p.m. may be used to drive the mill shaft at about 30 r.p.m. The use of a high-speed motor in connection with a gear unit is particularly desirable for adjustable speed drives of the constant horsepower type, where the auxiliary motor is mounted on the common shaft with the main motor.

Where a mill comprises a number of stands, groups or trains of rolls, the question of subdivision of drives is involved. Motor drive affords greater possibilities than engine drive for division of units. The principal advantages of such division are mechanical simplification and independent speed control. Isolation of the finishing rolls may also lead to better finish, through elimination of vibration.

Individual drive of the various stands of continuous mills has been suggested. Several advantages might accrue. Individual speed control would permit ready control of looping and allow adjustment for differing roll diameters, so that the exact relation required with grouped stands would not be necessary. This would reduce the variety of rolls required and permit leeway in turning individual sets. Any stand could be shut down and others adjusted to correspond. The piece could be finished in any stand and the final (later) stands stopped. Such an arrangement would eliminate considerable shafting and gearing and decrease the friction loss. These points are mentioned as suggestive of some possibilities of electric drive not yet fully developed.

The electrical efficiency of a reversing drive is necessarily a little low because of the conversions involved; it is of the general order of 66 per cent. Continuous running motors, either constant or adjustable speed, have efficiencies of the order of 85 per cent. The lesser friction losses in the reversing mill proper largely compensate for the lower electrical efficiency of the reversing drive.

Free Competition the Remedy in Coal Industry

Free competition involving "a gigantic struggle for existence" among the country's 10,000 coal mines in which "the fittest will survive" will solve the problem of too much coal and benefit the consumer, according to F. S. Peabody, Chicago, member of the American Institute of Mining and Metallurgical Engineers, and one of the leading bituminous coal men in the central competitive field. In a recent statement of his views Mr. Peabody asserted that over-development of the bituminous coal mines is adding $400,000,000 yearly to the nation's coal bill. Over-development, he figures, is costing about 80 cents on each ton of coal mined.

It is safe to say, according to Mr. Peabody, that the present developed capacity is fully one-third greater than any possible demand. The capital investment in active operations, he said, including developments and improvements and a reasonable coal acreage allocated to each mine, can be safely figured at two billions of dollars. The one-third over-development, therefore, amounts to nearly $700,000,000, on which the interest at six per cent is $40,000,000 per annum. There are approximately 700,000 men employed in the bituminous coal mines. The one-third excess amounts to 200,000 men, whose yearly wage figured at $1500 per man would come to $300,000,000.

"Under present conditions the mines must average at least 100 idle days per year. A coal mine cannot shut down on idle days without expense. Based on the actual experience of our company operating in 36 mines in 11 different districts, I figure that the cost of maintaining all of the mines in idleness for 100 days will amount to more than $50,000,000. "In dollars and cents, therefore, we have an item in the nation's yearly coal bill of about $400,000,000, which is directly caused by over-development. The normal consumption of bituminous coal in the United States, including the amount exported, is between 450,000,000 and 500,000,000 tons yearly. Over-development, therefore, is costing about 80 cents on each ton of coal mined."

"No solution has been presented that would effect the necessary cure," according to Mr. Peabody. "To those who have given the matter careful study," he said, "it would seem that the sensible thing to do is to do nothing. Under free competition, with general industrial conditions normal, the 10,000 units of the bituminous coal industry will be forced into a struggle for existence in which the fittest will survive and those least able to stand the strain of competition will be forced out.

It will take time, probably about ten years, but by allowing nature to take its course, we will have at the end of that period only the most efficient mines, able to produce coal at the lowest cost, and while the struggle for existence lasts competition can be depended upon to maintain a low level of prices. The situation is one that is bound to work directly to the benefit of the coal consumer.

Penn Seaboard—Carpenter Steel Merger Declared Off

It was announced on Aug. 5 that negotiations for consolidation of the Carpenter Steel Co. with the Penn Seaboard Steel Corporation have been definitely broken off.

It is stated that the Carpenter Steel Co. is now negotiating a merger with the Ludlum Steel Co., Watervliet, N. Y.

Iron Ore Output of Germany in 1918 and 1919

Data as to the German iron ore production in 1918 and 1919 have just been published in *Stahl und Eisen* for June 29. In metric tons they are as follows:

	1919	1918
Brown ore, under 12 per cent manganese	3,115,545	4,068,595
Brown ore, 12 to 30 per cent manganese	290,988	542,784
Manganese ore, over 30 per cent manganese	11,475	13,567
All other	2,735,826	3,289,951
Total	6,153,834	7,914,897

The average iron content of all the ores except the high (30 per cent) manganese ores, was 33.51 per cent Fe. in 1919 and 33.41 per cent Fe. in 1918.

Russian Steel Industries in 1921

Russia's pig iron, steel and rolled steel production in 1921 were as follows in metric tons, according to the *Mondliche Rundschau*, as published by *Stahl und Eisen*.

Region	Pig Iron	Open-Hearth Steel	Rolled Steel
Ural	68,518	84,373	88,976
South Russia	29,025	52,432	90,631
Central Russia	18,640	27,404	21,916
Total	116,183	164,209	201,523

German Iron and Steel Prices Sharply Up

Increase in Hematite Is 40 Per Cent—Steel Products Are Advanced 10 Per Cent—Both Accompany Fall in Value of Mark

(*By Radiogram*)

BERLIN, GERMANY, Aug. 14.—The Eisenwirtschaftsbund has raised the price of pig iron, effective Aug. 21, by approximately 40 per cent above the prices prevailing the first of the month. The new price of hematite is 16,767 marks per metric ton ($20.02 per gross ton, at the exchange rate of 11¾c. per 100 marks.) This parallels falling exchange.

The Steel Syndicate has raised the price of bars to 21,070 m. (1.12c. per lb.); thick plates, exceeding 5 mm. (0.20 in.), 23,660 m. (1.26c. per lb.) and other products proportionately.

German Price Trend Continues Upward

Declining Exchange, Higher Freights, Increased Export Taxes, High Wages and Costly Coal Continue to Force Advances

(*Special Correspondence*)

BERLIN, GERMANY, July 26.—The steel market continues active, with complaints of a decline in certain classes of exports, the cause of which is more the intense domestic demand than foreign competition. The great price advance caused by the latest decline in the mark continues. In a few days the Steel Syndicate will meet to fix new prices. The Eisenwirtschaftsbund has announced considerable increases for pig. Pig-iron prices were last fixed on July 1 to hold for the month, with the usual "coal clause," providing for an automatic increase. This increase took place, and the supplements, of 600 to 700 per metric ton, automatically came into force. The prices fixed to-day hold good for August if coal prices remain unchanged. The current and July prices are as follows, in marks per metric ton:

	August	July
Hematite	10,760*	8,265
Foundry iron No. 1	9,868	7,915
Foundry iron No. 3	9,798	7,845
Siegerland steelmaking	10,092	7,845
Spiegeleisen	11,116	8,869

All these rates are more than 100 per cent over those of March. The price of 80 per cent ferromanganese has been raised from 17,855 to 18,580 m., 50 per cent from 16,698 to 17,380 m., and ferrosilicon from 10,120 to 12,620 m. The causes of the upward movement are, indirectly the exchange, directly the increased cost of imported ore, wages, and transport. Ore not only bears the increased net cost due to the mark's lower value abroad, but also the heavy increase in import duties. In accord with a reparations commission demand that taxes should be fixed to increase automatically as the mark falls, the Government has of late altered week by week the gold supplement on import duties paid in paper marks. This week the supplement is 10,400 per cent, or 105 times the scheduled rates. Under the latest railroad freight schedule, July 1, the cost of carrying foundry pig iron is 90 times the pre-war cost, for spiegeleisen and raw steel 134 times, for shipbuilding material 234 times, and for certain wire products 309 times. These increases are for specified distances.

Prices Held Down by Official Fixing

In spite of reserve by some buyers, who anticipate a mark-exchange recovery and a consequent price-fall, the market is strong; and there is an extreme shortage of heavy material, so that were prices not officially fixed they would rise very much higher. The shortage of pig iron is aggravated by the fact that furnace employees, like the coal miners, are leaving for the building and other industries. The foreign ore supply is sufficient and there is an increased demand for native ore, which cannot be satisfied because of desertion by the employees of the Siegerland mines. The demand for manganese ore is strong, and offers are few.

The newspaper theory that the low mark exchange may check export by making the mark unsaleable abroad is not accepted by Berlin financiers and business men, who point to similar scares at earlier mark crises, and declare that as long as Germany produces goods for export her mark, however low, will be bought by foreigners. Toward the end of June there was difficulty in exporting semi-finished material, because of competition from other countries, but at present exchange this difficulty is eliminated.

The domestic demand for bars is exceptionally strong and producers who weeks ago announced a "selling embargo" have prolonged this measure, and refuse to accept orders. Wire manufacturers also report plenty of work. The engineering branches lately reported sufficient orders, but this week there are signs of a reaction. The demand for agricultural machinery has slackened, and fewer foreign orders are coming in. The same is true of machine tools, sewing machines and typewriters. The report of the Association of Foundries for the second quarter of 1922 complains that loss of workmen to other industries and shortage of materials has severely checked expansion, and that export, Eastern Europe excepted, was unsatisfactory owing to the high import duties of certain western countries. The South German foundries are enjoying uninterrupted good business, but this is partly the result of suspended production during the recent metal-workers' strike.

American Cancellation of Cutlery Orders

Conditions in the small iron and high grade steel branches are good, but active business does not everywhere prevail. The Hagen district companies report that the last mark exchange fall did not cause any increase in orders. Solingen reports cancellation of orders and expects dullness, because of alleged over-importation of Solingen goods into the United States, with a view to evading the tariff increase. Solingen prices have been rapidly rising.

The latest domestic prices are about 450 per cent over those of midsummer, 1921. Wages are also tending upward. A skilled worker who on Jan. 1 drew 11.30 m. per hr., this month draws 25 m. Solingen is helped by the fact that part of its work is done in homes, so that strict enforcement of the eight-hour day is impracticable. The demand for locks, screws and certain other small iron products has been active since the last mark fall. Coal shortage in these branches is

*This price was later raised to 11,817 marks, as shown by cablegram published on page 389, Aug. 10.

more serious than ever. The Ruhr report for June shows a new heavy drop in output.

Further Amalgamations

The Phoenix Corporation of Horde, Westphalia, is about to establish new blast furnaces and coke ovens, as well as a works for conversion of slag into bricks. Merger plans are announced between the Lorraine group and the Westphalian Mining & Coal Exploitation Co., of Horde. The Siegen-Solingen Cast Steel Co., which before the war was in poor condition, has, following reorganization, increased its capital, and combined or established relations with several important companies, including the Weyersburg Kirschbaum bicycle company, which also makes firearms, and is the only German works permitted by the Allies to produce for the army. Further expansion for Siegen-Solingen is discussed and the corporation promises to rank with the Stinnes, Phoenix, Rhenish Steel and other large groups.

Wire Nails Imported by England

At a hearing in London on the proposition to place a tariff on wire nails, Oscar Moenich is reported by *Iron and Coal Trades Review*, in part, as follows:

The reason why, previous to the war, wire nails at times were very little dearer than ordinary wire, was due mainly to ordinary market fluctuations and to the fact that wire nails offered a favorable means of disposing of a substantial quantity of steel in simple form which might otherwise not be made good use of. Wire nails often are made from wire shorts, the market value of which is below that of ordinary wire.

Imports come from Belgium, Germany, Holland, Austria, France and from the United States, which, though enjoying an appreciated currency at present, is exporting nails to England at lower prices than those of Continental makers. The imports during 1912, 1913, 1920, and 1921 were as follows:

British Imports of Wire Nails, Gross Tons

	United States	Germany	Belgium	Holland	Total
1912.....	9,974	19,726	24,962	726	55,501
1913.....	6,732	19,959	22,827	470	50,246
1920.....	8,580	4,919	15,167	1,467	43,358
1921.....	3,456	5,500	21,217	1,744	35,600
1922*.....	578	2,874	6,753	716	.....

*First three months.

The fact that a number of (British) concerns which made wire nails during the war had had to discontinue this work was due largely to unecomonical working and to their having been established too far from the wire drawing mills. A German manufacturer stated that a man would produce 7½ tons of nails per month, or 90 tons per annum, so that the total number of hands required to turn out the 10,485 tons said to have been the British manufacturers' production during 1918 would only be 120.

CHINESE MARKET DULL

Merchants Await Political Developments—British Prices Cut and Keep Buyers Out of Market —Export Figures

(*Special Correspondence*)

SHANGHAI, CHINA, July 10.—It is difficult to find any improvement in steel in China. Nearly all steel importing interests in Shanghai report that business is practically at a standstill. A recent cut of 10 shillings per ton by British manufacturers has had the immediate effect here in China of keeping Chinese buyers out of the market. While there is no decided impression that prices will decline further, still the large Chinese buyers feel that in the absence of inquiries from the interior, it is safe to await political developments before going strongly into the market at Shanghai.

Hankow imports of copper ingots from America and Japan have been sufficiently large in the past few months to call for special comment. During the period Jan. 1 to May, 1922, the total imports of American copper ingots amounted to approximately 12,847,000 lb., of Japanese copper ingots, 4,706,000 lb., and of other foreign ingots through Shanghai, 1,177,000 lb. Hankow in recent years has replaced Shanghai as the center of the copper market for Central China. This copper is used almost entirely for minting purposes.

Chinese Iron Ore Exports Decline

Last year the export of iron ore from China recorded a distinct decline from 11,292,407 piculs (1 picul = 133.5 lb.) in 1920 to 8,517,162 piculs in 1921. Antimony ore decreased by some 3000 piculs and in 1921 stood at 19,459 piculs. Lead ore, zinc ore, antimony regulus, quicksilver and spelter all showed increases in 1921 but diminutions in quantities were returned for crude antimony, iron bars, iron plates and sheets, and tin in slabs, exports of tin receding from 189,940 piculs in 1920 to as low as 103,035 piculs in 1921. Tungsten ore exports totaled 39,054 piculs last year.

Visible supplies of iron and steel are ample for the needs of the country for another three months. In some lines heavy stocks are being carried, while in others stocks in warehouses cannot be said to be large.

EXPORT BUYING LIGHT

Japanese Buying Confined Largely to Government —United States Imports Foreign Iron

NEW YORK, Aug. 15.—Export trade continues quiet, most of the buying from Japan being from Government sources. The Chinese market shows little activity. Purchases of South American countries are usually in small lots of well under 100 tons. Some pipe has been bought lately by Rio de Janeiro, Brazil.

Among the governmental and municipal inquiries in the market from Japan is a tender from the city of Nogoya, calling for bids on 2500 tons of grooved rails of 127-lb. and some 93-lb. sections, and including frogs, switches and other track accessories; bids closed Aug. 10. The Imperial Government Railways are receiving bids on 400 tons of beams. One of the large Japanese houses in New York has booked an order for 32 miles of 12-lb. rails and one mile of 40-lb. rails for shipment to Formosa. The city of Osaka has purchased 250 tons of structural material through a Japanese exporter and there is an inquiry now current for 850 tons of reinforcing bars from a private source.

Black sheet business is still dull. Lately a considerable interest has been manifested in Japan in No. 1 heavy melting steel. Some heavy melting steel has been shipped from the Pacific coast, as recently reported in THE IRON AGE, and a number of Japanese export houses are now handling inquiries for tonnages of various size. Japanese exporters here are obtaining quotations on scrap f.a.s. Boston, New York or Philadelphia, as well as f.a.s. Pacific coast ports.

Pig Iron Imports

Importations of foreign pig iron continue fairly heavy. Some export and import houses are bringing in small tonnages of Scotch iron, usually of 100 tons to an order, which is being furnished to small foundries in the New England district. One company which handles large quantities of ore and pig iron is selling foreign iron of Belgian, Luxemburg and French origin to pig iron dealers and in the past week or ten days has received shipments of about 9,400 tons at prices c.i.f. Atlantic port, ranging from $22.50 to $25 per ton, according to analysis. Scotch iron is evidently the most popular and the average quotation recently made on No. 3 Scotch iron, c.i.f. New York, has been about $26.80 per gross ton. Iron quoted at this price generally analyzes about 2 to 3 per cent silicon; 0.01 to 0.05 per cent sulphur; 0.3 to 0.4 per cent phosphorus and 0.8 to 1.20 per cent manganese.

British Pig Iron and Steel Output for July

LONDON, ENGLAND, Aug. 14 (By Radio).—The production of pig iron in Great Britain in July was 399,100 gross tons and that of steel ingots and castings 471,100 tons. These compare with 369,200 tons of pig iron and 400,200 tons of steel ingots and castings in June.

The pig iron and steel output for Great Britain by

months so far this year has been as follows in gross tons:

1922	Pig Iron	Steel Ingots and Castings
January	288,000	327,500
February	300,100	418,800
March	389,800	549,400
April	394,300	404,200
May	407,900	462,300
June	369,200	400,200
July	399,100	471,100

The July outputs of both pig iron and steel are the second largest month of the year in each case. The 1921 pig iron production averaged 217,600 tons per month and the steel output 302,100 tons per month. In 1913 the two figures were 855,000 tons and 639,000 tons per month respectively.

Swedish Pig Iron and Ore Output in 1921

The pig iron production of Sweden in 1921, according to data published by *Stahl und Eisen*, taken from *Kommersiella Meddelanden*, was 313,080 metric tons. The outputs for recent years are given as follows in metric tons:

1913	730,207 tons
1918	761,822 tons
1919	493,701 tons
1920	470,550 tons
1921	313,080 tons

The 1921 production is stated to be the lowest in 50 years. Only about half the blast furnaces of the country were in operation during the year.

The country's production of iron ore, including schlick, was 6,464,347 tons in 1921, or 43.1 per cent in excess of the 1920 production. The data for recent years follow:

Year	Mines Operating	Output, Tons
1913	295	7,475,571
1914	313	6,586,630
1915	323	6,883,308
1916	345	6,986,298
1917	388	6,217,172
1918	363	6,623,661
1919	308	4,981,110
1920	279	4,519,112
1921	240	6,464,347

Of the 1921 production 483,707 tons was "schlick," or low grade ore.

Improved Outlook for Machinery

"Within the last few weeks we have closed more machinery business than in any two months during the last year and a half," states F. C. Biggert, Jr., president of the United Engineering & Foundry Co., Pittsburgh. "It can be further said that there are now good prospects for a large volume of machinery sales, and every indication that the third quarter will close with our plants operating at a very satisfactory rate.

"For several months the roll foundries have been gaining ground and recently have been able to produce at nearly the old capacity, that is, the capacity prior to the extensions at American department, Canton. The new capacity at American represents an addition of about one-third over the previous total, and as there has not been an opportunity to develop new business to meet this additional capacity, we feel that our present scale of operation is satisfactory.

"We have been quoting very close prices and to keep busy, must continue to do this. Prices will doubtless rise; this will be mainly due to increased costs of material and labor which are sure to follow increasing demand. Increased prices due to these causes are legitimate, but increases due to carelessness, inefficiency and excessive profits are not legitimate and are to be continually guarded against in a rising market."

The company recently made a shipment of five carloads of rail rolls from its Canton plant, bound for the Tata Iron & Steel Co., Calcutta, India. This shipment represented approximately 240 tons of a total of 900 tons ordered.

Cost of living in Great Britain is estimated for July, by the British Labor Ministry, at 84 per cent above July, 1914. This compares with 80 per cent in June. The high point was reached in November, 1920, with 176 per cent above 1914; by November, 1921, this excess had fallen to 103 per cent.

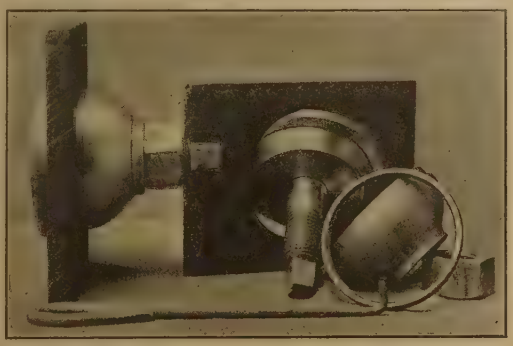
Safety Hand-Hole Plate for Boilers

The accompanying illustration shows a hand-hole plate designed for use on high or low pressure stationary or locomotive boilers and other places where a reliable hand-hole plate or plug is needed. An outstanding feature of this design is that a new gasket can be applied simply by releasing the pressure on the boiler. Each plate can be readily put in and taken out of the round hole that it closes, the hook shown being used to remove and replace plate where it is inconvenient to do this operation by hand.

A feature emphasized by the inventor is the oval flange that fits on the inside of the hole. This, it is claimed, is of suitable thickness so that it is impossible to blow it out with steam or water pressure, as the boiler would burst first. Another feature contributing to the safety of the device is the use of a metallic or copper gasket which will not go to pieces and blow out while under pressure.

There is no tendency to pull the plate through the hole by tightening the nut, as the gland on the cap simply pushes the gasket over the bevel of the plate. No strain is put on the boiler sheet. The joint is made by forcing a copper or metallic gasket over the bevel of the plate with the cap, tightening bell which has an extended gland on it of suitable depth. This cap fits over a central stud attached to a plate and by turning the nut the stud gasket is forced to find a seat against the wall of the hole, in this way making a very tight joint.

The nut can be tightened under pressure as the plate



Hand-Hole Plate for Boilers. A new gasket can be applied by releasing the boiler pressure

cannot be pulled through the hole. It is claimed that even if the stub should be broken off, danger of scalding is eliminated because the pressure on the boiler would hold the plate in place until the boiler could be emptied or the pressure blown off.

William C. Jacobs, 2011 South Seventieth Street, Philadelphia, is the inventor of the device.

New Micrometer Caliper

A new one-inch micrometer caliper, known as the No. 435 has been added to the line of the L. S. Starrett Co., Athol, Mass. It is intended as a low priced tool and is equipped with a ratchet stop if desired. The frame is drop-forged and black enameled. Decimal equivalents are marked on the thimble. The screw is 0.312 in. in diameter and the contact points 0.270 in., a construction intended to provide large wearing surface and assure long life.

In its exhibit of chains at the American Mining Congress Exposition, Cleveland, Oct. 9-14, the Morse Chain Co., Ithaca, N. Y., will have a 100-hp. chain drive in operation with rotoscope attached to show the rocker joint action as the chain enters and leaves the sprocket. A baloptican of the Bausch & Lomb Optical Co., which will show on a screen a series of chain-drive installations and views of the Morse plant will also be included.

Modern Blast Furnace Plant on the Yangtse

American Design Chiefly Followed—Assembling Costs at Hanyang Greatly Reduced—Steel Works and Rolling Mills to Be Built

BY EDWIN A. SPERRY*

WHILE the United States can point with pride to some of her model industrial plants it will be of undoubted interest to learn that there is under construction in China an iron and steel plant which has followed the lines of the most recent practice both in organization, and, as well, in technical equipment. While the plant is on no such scale as many in the United States, it reflects much credit on those who have backed the undertaking and goes far to indicate the growing tendency in China toward the progressive adoption of modern methods. It is the direct outgrowth of a careful study of economics and marks the beginning of advanced industrial undertakings in a country which has heretofore been given to unorganized effort. The location is near the well known Tayeh iron mines, descriptions of which have appeared in the technical journals. The company operating is designated as the Tayeh Iron & Steel Co. and is a subsidiary of the Han-Yeh-Ping Iron & Coal Co. which now operates the Hanyang Iron & Steel Co. at Hanyang, the Tayeh mines and the Pinghshiang collieries.

A brief history of the company and of the circumstances which led up to the establishment of this new plant will be of interest.

In 1890 Chang Tseyung, then viceroy of Kwangtung Province, in which Canton is located, conceived the idea of establishing an iron and steel plant at Canton. Having been transferred to Wuchang as viceroy of Hupeh Province, he decided to erect the plant in that locality. As a suitable site was available at Hanyang, just across the Yangtse River from Wuchang, this location was decided upon and the machinery was brought from Canton where it had been landed, and the work of installation started.

In 1896 the plant was started up but ran for only a short time, being obliged to close down on account of the fact that suitable coke was not obtainable in China and had to be brought in from foreign countries at high cost.

Previous to this time, 1877, Sheng Sun-hwei, a prominent Chinese Government official, in his efforts to develop the mining industry of China, especially that of iron, instituted a search for workable bodies of iron ore. He soon found the Tayeh iron beds, secured the ground in which they were located and began development. These deposits had been worked some 300 years before and native smelting had been carried on, as is indicated by the name, which means "large smelter." Huge piles of slag indicate quite extensive operations at this time. The Hangyang works obtained ore and limestone from this district as there are large beds of a very pure limestone lying immediately adjacent to the ore beds.

After the shutdown in 1897 a reorganization was brought about on a more practical basis. Search was made for coal beds, which resulted in the discovery of these at Pinghshiang in Kwangsi Province. Investigation proved the coal to be suitable for coking for furnace use. Washing plants were installed and coke was made at the start in simple native coke ovens such as will be described later.

Fig. 1. Portions of Hupeh, Hunan and Kiangsi Provinces, Showing Plant at Hanyang and the Later Plant at Tayeh, Farther Down the Yangtse River

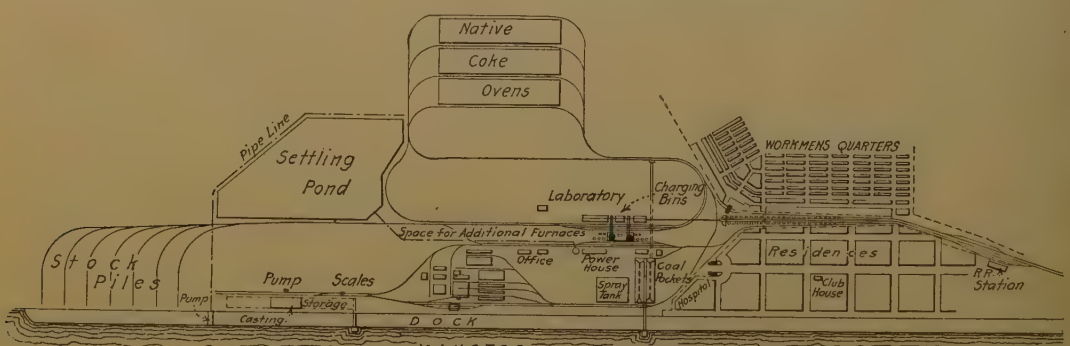


Fig. 2. Plan of Blast Furnaces, Coke Ovens and Auxiliary Plant

*Department of Metallurgy, Pei-Yang University, Tientsin, China.

Fig. 3. Original Conditions

Fig. 4. Town from Furnace Head

Fig. 5. Main Street

Fig. 6. Company Clubhouse

Fig. 7. Coal Pockets

Fig. 8. Native Coke Ovens

Fig. 9. Ore Bins from Coal Incline

Fig. 10. Tapping Gallery and Fan House

The plant at this time consisted of two 60-ton blast furnaces, two acid Bessemer converters and a limited rolling equipment. The product proved to be unsatisfactory, so in 1905 a Chinese engineer was sent abroad with samples of the ore, coal and coke and specimens of the steel products. The problem was submitted to J. E. Stead, who determined that there was just too much phosphorus in the ore for the acid Bessemer and not enough for the basic Bessemer process, being on an average 0.05 per cent. He advised the use of the basic open-hearth process and it has given very satisfactory results.

The coal was washed and coked at Pinghshiang and shipped partly by rail and largely by water, as the railroad line had not then been built from Changsha to Wuchang as at present. The distance from the colliery to the blast furnace was about 300 miles and the coke required two handlings after loading at the ovens. This meant high transportation costs and large losses of coke caused by crushing. The ore and flux was brought up the river, a distance of about 90 miles, by barge at a heavy transportation charge. This also necessitated an extensive barge and tug equipment.

After operating under these disadvantageous conditions for a number of years, the company was forced to work out a method based on economic conditions and finally decided to start in on the erection of a thoroughly modern plant near the mines at Tayeh and so design it as to provide for progressively additional equipment, the completed plant to consist of eight blast furnaces with a capacity of over 3000 tons of pig per day, a steel plant and adequate rolling machinery.

In 1914 Dr. Z. T. K. Woo, general superintendent at the Hanyang works, was sent abroad to study the latest developments in the industry. Owing to the war, his work was practically confined to the United States, and after a year's tour of investigation he returned to China equipped with the latest plans and ideas.

In the meantime work was organized and started in surveying and grading the site, which consisted largely of flooded areas and hilly islands as shown in Fig. 3, for which the photograph was taken from the further bank of the settling pond looking toward the upper left-hand corner of the general plan, Fig. 2. The difficulties of the work are clearly evident and the results can be seen from Figs. 4, 5 and 6.

The essential changes which will be made in the methods of operation are: First, the coal will be washed at Pinghsiang and transported by boat to Tayeh, where it will be coked near the furnaces; second, the ore and flux will be transported by rail, with a short haul from the mines and quarries, and delivered directly to the charging bins. The economy of this plan seems obvious and need not be discussed here.

Provisions have been made for receiving the coal in a large storage pocket shown in Fig. 7. This is constructed of concrete and has a system of underground roadways so arranged as to make it possible to load cars from any one of the divisions. This roadway passes under the tracks for some distance and then, by a gentle incline, rises to the loading house where it is transferred to cars in which it is delivered to the coking plant. At present the simple native ovens will be used, the design of which is indicated in Fig. 8 which shows them in process of construction. Eventually, by-product ovens will be built on the site of the native ovens and the gas from these will be used for generating electric power to be used at the plant and the mines. The coke is brought to the furnaces in buckets ready for hoisting and charging.

The ore and flux will be brought to the furnaces

over a trestle and delivered to the bins shown in Fig. 9. These bins are also of concrete, with trackways beneath. Electric trolleys operate on these tracks, bringing the material to the charging inclines in buckets ready for hoisting to the furnace head.

The water circulation is derived from a settling pond from which it is pumped to an elevated tank 46 ft. in diameter and 36 ft. in depth, with an estimated capacity of 3,600,000 gal. or 1500 tons of water. From this tank it is supplied to the furnaces and is then delivered to a spray cooling pond from which it is returned to the tank. In times of low water the supply in the settling pond is maintained by pumping from the river through the pumping plant shown near the casting house in the general plan.

The gas from the furnaces is passed through a system of dust catchers and scrubbers and will be used for the heating of the blast. The surplus will be burned under the boilers for generating power, provision having been made for this in the construction of the boiler equipment. In heating the stoves, air is provided independently of the blast air. This is accomplished by the use of a fan located in the building situated between the two furnaces of each unit pair.

The pig is tapped at the tapping gallery, Fig. 10. It is delivered to a 60-ton ladle and taken to the casting house near the river bank, as shown in the plan.

The slag will be run into a granulating tank from which it will be conveyed by means of a heavy centrifugal pump to the ponds or depressions which will be filled in this manner. This pump is located in the same building with the fan which supplies air for the heating stoves and is directly back of the granulating tank.

The present furnaces have a crucible 15 ft. 5 in. in diameter, with a depth of 8 ft. 2 in. below the tuyere level or 9 ft. 10-in. below the lower end of the bosh. The bosh is 13 ft. 2 in. high and widens to a diameter of 22 ft. The shaft has a height of 51 ft. 2 in. above the top of the bosh, which with an additional height of 16 ft. 4 in. for the bells gives a total height of 90 ft. 6 in. from the bottom of the crucible to the charging platform. The capacity is rated at 450 tons of pig iron daily.

While the plant may be considered small by comparison, it must be remembered that it was only 30 years ago that any attempt was made toward adopting modern methods and that up to that time the most primitive and crude processes were used in the production of iron in China and that to this day many of these primitive plants are still in operation.

LITTLE TONNAGE ACCEPTED

Mahoning Valley Companies Conservative About Booking Orders

YOUNGSTOWN, Aug. 15.—Little new tonnage is being accepted by Valley interests, owing to the uncertainties attendant upon production and the desire to fill as much as possible needs of regular customers. Steel companies are making every effort possible to replenish coal supplies, but are meeting with indifferent success. Whereas the ruling price on Pennsylvania coal, run-of-mine, ranges from $8 to $10, one interest reports that it purchased, within the week, 30 carloads of coal, various grades, at $6.75, f.o.b. mine. A selling interest states it has offerings at $8.50, but cannot, of course, guarantee delivery.

It is the sharp advance in coal prices which is gradually forcing steel prices toward higher ground. Current fuel costs of $8 to $10 compare with $3.25 to $3.50, prevailing prior to July 1. One Valley independent filled its May-June coal requirements at $2.35, mine, buying Southern coal. High-priced coal is now entering largely into production, and it is very evident that it is having an appreciable effect on costs.

At the moment, buying of scrap has weakened, though steel makers are using larger tonnages than usual in their open-hearth departments, owing to curtailment of iron production.

In finished lines, there is firm demand for sheets, strips, tin plate, pipe, wire nails and bars, while plate demand has shown considerable improvement. The market on plates has moved to a minimum of 2c., ranging up to 2.10c., while one maker reports it has entered some tonnage, comprising the lighter gages, as high as 2.70c. Much of the current plate demand is for boilers and tanks. A Valley interest producing storage tanks reports active inquiry, with its capacity oversold several months ahead.

The spread on sheet prices continues from 3.15c. to 3.30c. for black, and 4.15c. to 4.30c. for galvanized, with still higher prices applying on tonnages where the mills put forth special efforts to expedite delivery. All Valley interests have well filled order books.

There has been quickened demand for full finished sheets from the automobile industry, with the chief independent making no effort to supply other than its regular trade. The Newton Steel Co. is pushing the installation of six additional mills at its Newton Falls property, and expects to have them ready for production around the first of the year. No action has yet been taken by the Falcon Steel Co. to proceed with the four mill addition to its eight-mill plant at Niles, which was under consideration earlier in the year.

Operations of non-integrated sheet rollers as yet show no abatement, and managers say sufficient bar supplies are in sight to maintain rollings at a normal rate through September. Such interests are getting in coal, but are paying the higher prices.

Little headway has been made by Valley independents owning coal properties in Pennsylvania, in increasing production. An interest operating its mines open shop has less than 100 men at work, and most of these are foremen or bosses. Production costs are increased by the necessity of maintaining guards.

As yet there has been comparatively little interruption to the outbound movement of steel products. Some Valley executives are more apprehensive, though, over shortage of cars, upon ending of the strikes, than ability to secure coal.

Valley furnace operators say indications point to an ample ore supply through the winter months and until the opening of navigation in 1923. Movement of ore over the Great Lakes routes has been substantial this year and it is expected furnace yards and lake docks will be well stocked by the close of navigation.

Steel Corporation's Unfilled Orders

The unfilled tonnage reports of the United States Steel Corporation for July showed 5,776,161 tons at the close of that month, or 140,630 tons more than reported on the books June 30, and the largest amount reported since April 30, 1921, when unfilled orders stood at 5,845,224 tons. The increase last month compares with one of 381,303 tons in June, 157,315 tons in May and 602,765 tons in April, and decreases of 353,079 tons, 100,609 tons and 26,736 tons in March, February and January, respectively. On July 31, last, the Corporation had 945,837 tons more of unfilled business on its books than it did a year ago. Following is the unfilled tonnage as reported by months since January, 1920:

	1922	1921	1920
Jan. 31	4,241,678	7,573,164	9,285,441
Feb. 28	4,141,069	6,933,867	9,502,081
Mar. 31	4,494,148	6,284,765	9,892,075
Apr. 30	5,096,917	5,845,224	10,359,747
May 31	5,254,228	5,482,487	10,940,465
June 30	5,635,531	5,117,868	10,978,817
July 31	5,776,161	4,830,324	11,118,468
Aug. 31	.....	4,531,926	10,805,038
Sept. 30	.....	4,560,670	10,374,804
Oct. 31	.....	4,286,829	9,836,852
Nov. 30	.....	4,250,542	9,021,481
Dec. 31	.....	4,268,414	8,148,122

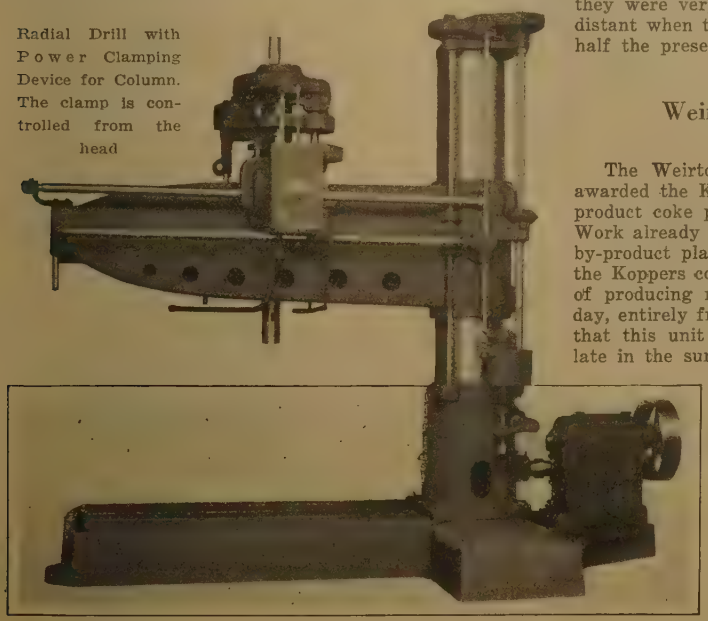
The largest total of unfilled orders was on April 30, 1917, when it was 12,183,083 tons. The lowest was on Dec. 31, 1910, at 2,605,747 tons.

The Steel Co. of Canada, Hamilton, Ont., is making extensive repairs to one of its blast furnaces, another of which has just been repaired and is ready to be blown in at any time.

Drill with Power Clamping Device

In drilling at the extreme end of the arm on a large radial drilling machine it is inconvenient for the operator to leave his place and tighten the swinging column with the arm at each shift of the drill. To obviate this, the Dreses Machine Tool Co., Cincinnati, has brought out a power column clamping device arranged as shown in the illustration. It was developed, it is said, because although pneumatic devices for this purpose have been successfully applied, not all shops have compressed air, and where it is available the piping to the machine is frequently expensive and inconvenient.

The device receives its power from the vertical driving shaft, which extends through the oval box. By means of friction clutches the screw below the box runs right or left handed, and a nut, to which is forked a lever, works on this screw. The hub of the lever is tapped and works on the column binding screw. The engagement of the friction clutches in connection with the screw is accomplished by a cam located on top of the box. The cam is operated by the splined vertical and horizontal shafts, a pair of bevel gears, and the lever and links attached and moving with the head, as shown. The friction clutches are self releasing and also slip at either end of the tightner-levers movement.



Radial Drill with Power Clamping Device for Column. The clamp is controlled from the head

The arrangement does not interfere with the hand-column clamping device in front of the column.

Manufacture of Pig Iron in New Zealand

According to the *Dominion* (New Zealand) the first tapping of the blast furnace at Onakaka took place on April 27. This furnace was erected by the Onakaka Iron & Steel Co., Ltd., which was formed for the purpose of developing a part of the extensive iron ore deposits of Golden Bay. The company, which has installed a modern plant for the production of pig iron, has its own supplies of coal, iron ore and limestone, and is able to get the ore and the limestone in an open quarry opened out not far from the furnace. The furnace is now, it is reported, running smoothly, no difficulties being encountered, and is tapped about every 8 hr.

As the furnace settles down to work, about 8 to 10 tons of pig iron per tap will be produced. The expert in charge is reported to be well satisfied, and to say that the iron produced is all that could be desired, and quite up to the desired quality.

Costs of raw materials, per ton of iron at the furnace, including royalty, labor and transportation are reported to be: Iron ore, 12s. ($2.70 at $4.50 per £1); limestone, 3s. (67½c.); coke, £2 ($9). Labor is not more than 15s. ($3.37½). It is estimated that coal from the company's mine, when opened up, will cost not more than 15s., including royalties, at the works.

The Basset Direct Steel Process

Whatever may be the future of the Basset direct process of steel making, it is clear that a large number of shareholders in the company are not satisfied with the complete absence of practical results, says the *Engineer*, London. M. Basset admits that there have been technical difficulties, which, he says, are all being overcome. There has been trouble with the linings of the rotary furnaces which were unable to stand the extremely high temperatures necessary for the success of this process. M. Basset also confessed at the general meeting that he is at present unable to produce steel to specification. This, he said, depends solely upon the furnace. Although large works have been equipped for the production of Basset steel the process has not yet entered the industrial phase but, said M. Basset, they were very near it, and the time was not far distant when they would be producing steel at one-half the present cost and exporting it to England.

Weirton Steel Co. to Build By-Product Plant

The Weirton Steel Co., Weirton, W. Va., has awarded the Koppers Co. a contract to build a by-product coke plant and motor fuel recovery plant. Work already has begun on the first battery of the by-product plant which will consist of 37 ovens of the Koppers company's new design, with a capacity of producing more than 600 net tons of coke per day, entirely from high volatile coal. It is expected that this unit will be completed and in operation late in the summer of 1923. Ultimately the plant will consist of three batteries of ovens.

The design of the ovens to be built at Weirton is the same as that of the five-oven battery which has been in operation at the plant of the Chicago By-Product Coke Co. for the past six months. Each oven will have a capacity of more than 14 net tons of coal per charge. This new type of oven is about 14 in. wide and embraces an entirely different system of heating than the old Koppers design. The ovens are so arranged that at any time they can be heated with either blast furnace or producer gas. thus releasing all the valuable coke oven gas for use in the steel works. The Chicago plant, with ovens like those to be constructed at Weirton, has been operating on an average coking time of 12 hr. and has been on as low coking time as 9 hr. 50 min.

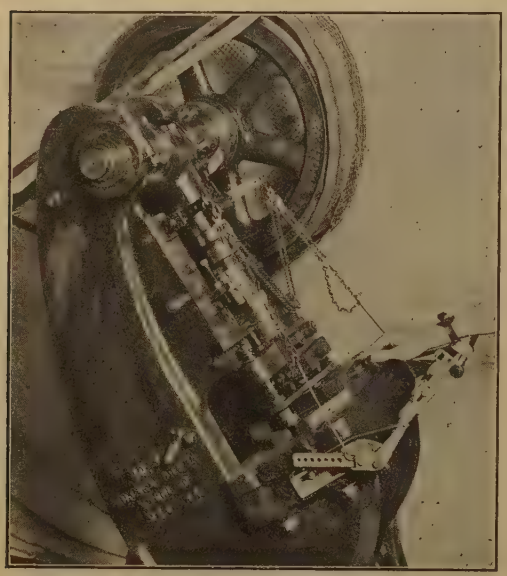
Valuation Engineers Wanted

WASHINGTON, Aug. 15.—The collection of the income tax becomes a complicated affair after it passes the point of figuring the return of the average wage earner. The technical staff of the Bureau of Internal Revenue is in need of valuation engineers in general mining, coal mining, oil and gas, and the forest industry. The positions pay from $3,600 to $4,800 a year. The United States Civil Service Commission will receive applications until Oct. 1. No written examination will be given; the ratings will be based upon education, training, experience and physical ability. The duties involve estimation of quantities, market values, value of equipment, cost of development, etc. Information and application blanks may be secured from the commission at Washington, D. C., or the civil service board at the post office or custom house in any city in the United States.

Device for Safe Operation of Presses

A safety device for use in connection with presses and drop hammers, and which is a departure from those controlled by a trip arrangement or operated by a side sweeping motion, has been placed on the market by the Gibbons Engineering Co., Worcester. It is said to be adaptable to any type of press, having any type of die.

The device is shown in the illustration attached to an inclinable press. It consists of two housings attached to the right and left sides of the platen of the press, which support a shaft that holds a right- and left-hand rocker bar or lever, the bar being keyed to the shaft. Two adjustable uprights hold the safety bar. Two independent and specially made chains, intended to assure the operator double protection, are attached to



Safety Device Installed on Inclinable Press. The safety bar can be regulated for various work

a perforated rocker lever arm as shown, and at a length equal to that of the press stroke, giving an angular motion of 6 in. The chain, after going through the pulleys, is placed in two open slots on a ram nut, and can be detached instantly. The ram nut can be attached at any convenient place over the slide-nut rest. This arrangement gives ram control.

A wrist strap with a metal part attachment on the under side is provided, as shown, the strap being made so that it will not twist on the wrist or slide on the operator's arm after adjustment. When adjusted it rests against the safety bar while the operator feeds work into the press. The safety bar having an angular motion controlled by the motion of the ram traverse, the operator's hand is removed from the danger zone on each downward stroke of the ram, by a natural backward movement, instead of a sweeping movement across the press. The wrist attachment also prevents the operator's hand from going into and over the die too far. Where a press is not provided with a standard non-repeating clutch, and the ram descends for any reason, the safety bar forcibly removes the operator's hand.

The backward-and-away-from the die motion of the safety bar can be regulated for any kind of work or for any physical characteristics of the operator. Regulation is by the safety bar itself and the side housings.

The Union Steel Corporation of South Africa is reported by the London *Ironmonger* to be busy, and although prices are being cut, it is prepared to cut still further in order to hold all the South African trade possible. It is now rolling 45-lb. rails, for which there is a fair demand, and before the end of the year it expects to be rolling girders and channels.

Unusually Heavy Building Construction

More industrial building construction was started in July than in any other month since November, 1920, according to figures compiled by F. W. Dodge Co. The amount is given as $31,882,000, or 9 per cent of the month's total of $350,081,000 for all building operations. The total is 2 per cent above that for June, 1922, and 65 per cent over that for July, 1921. It is greater than any previous monthly total except the record figures for April and May of this year, and marks the fourth successive month of unprecedented building activity.

Building contracts in the district comprising Illinois, Indiana, Michigan, Wisconsin, Iowa and Missouri, amounting to $124,655,000 in July, gave the largest monthly figure ever recorded. Construction in this district during the first seven months of 1922 has amounted to $595,668,000, or 29.2 per cent of the total of $2,041,065,000 for the 27 states covered (everything north and east of a line from Topeka, Kan., to Savannah, Ga.) The total is 60 per cent above the figures for the first seven months of 1921.

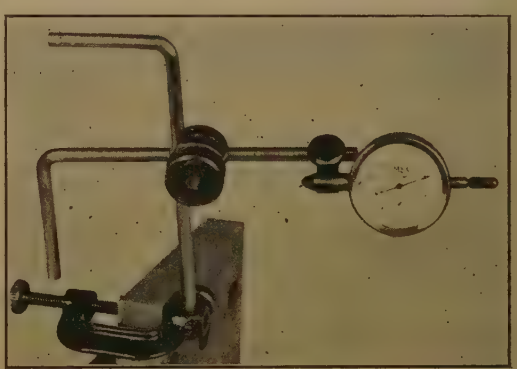
Drill Steel Survey

The comprehensive field survey conducted by the Bureau of Mines and the Bureau of Standards to determine the present status of heat treatment and breakage of rock drill steels has been completed. C. Y. Clayton and H. S. Burnholz, the investigators, recently visited some twelve mines. Data were collected from these mines on heat treatment, kinds of drills and steels in use, etc. A detailed report will be sent to the superintendents of the mines visited and it is probable that comprehensive reports giving the results of the investigation will be issued later as Government publications, to be available to the general public.

Universal Attachment for Dial Gage

An attachment, known as the Junior universal, for use with its Junior dial cylinder gage outfit, has been placed on the market by the B. C. Ames Co., Waltham, Mass.

The component members of attachment may be noted from the accompanying illustration, which shows also the set-up for proving the straightness of valve



Universal Attachment for Dial Gage Set Up for Checking Valve Stems

stems. It clamps in any position permitting gaging at any angle and may be attached to any object that will fit between the jaws of the clamp.

Indicating straightness of crankshafts, camshafts, thickness of piston rings and thickness of other material such as shims, bearing liners, etc., are among its uses. It can be used also in ascertaining the diameter of pistons and indicating the truths of fly wheels, gearbox shafts and angles. The universal attachment in connection with the dial cylinder gages provides a complete testing outfit, but where the cylinder gage feature is not required the attachment may also be used with the company's dial gage head.

Notes on Basic Electric Furnace Operation

Grade of Lime Necessary—Reducing the Phosphorus and Sulphur—Malleable or Gray Iron Castings—High and Low Tap Voltages

BY CHARLES WELLMAN FRANCIS

IN an article published in the preceding issue of THE IRON AGE* the author discussed briefly the charging of an acid furnace heat. This same method will apply to the basic furnace with the exception that in basic practice a certain amount of lime to form the oxidizing slag is either charged with the scrap or added after the charge is partly melted. The best grade of lime for this purpose is a metallurgical lime, high in calcium oxide and low in magnesia, as a high magnesia content will tend to make the melting sluggish and the slag formed will be heavy and hard to manage.

Removal of Phosphorus and Sulphur

An oxidizing atmosphere must exist in the basic electric furnace before the removal of phosphorus is possible, lime being the agent to promote this condition. The phosphorus in the steel having a greater chemical affinity for oxygen than the calcium of the lime, unites with the oxygen to form phosphoric pentoxide which is held suspended in the slag, this reaction taking place under fairly low temperature conditions. When the scrap is completely melted, this slag is drawn off as completely as possible. When a poor grade of scrap has been charged or a scrap high in phosphorus, and an extremely low specification for phosphorus is to be met, as is sometimes necessary with the finest grade of alloy steel castings, it is often necessary to throw another blanket of lime over the molten bath for the further removal of phosphorus. This slag is likewise removed and analysis shows that the phosphorus content is now extremely low and that we can proceed further with the heat.

The next procedure is to remove the sulphur in the steel. To accomplish this the exact opposite conditions must be attained, namely, a reducing atmosphere in the furnace which is obtained by a deoxidizing slag. The chief agent in obtaining this condition is carbon which is used in the form of ground petroleum coke, because this type of coke is the purest and has the lowest sulphur content. A mixture of lime and ground petroleum coke is then thrown on the bath to form this deoxidizing slag.

Steel chemists are still somewhat in doubt as to the exact chemical reaction which takes place at this point, but it is generally conceded that some of the carbon unites with the calcium of the lime to form calcium carbide while the remainder combines with the oxygen to form carbon monoxide and carbon dioxide. In 15 to 20 min. a test of this slag is taken from the furnace on the end of a hook and if its ingredients are right it will appear as a black, spongy mass which on being exposed to the air disintegrates and crumbles away to a grayish white powder which smells strongly of calcium carbide. This slag is known as the carbide slag or white slag, and its presence indicates that sulphur has been eliminated to a high degree. The existence of this slag indicates a state of chemical equilibrium, so to speak, and so long as the slag can be kept in this condition the analysis can be held constant for an indefinite time. An analysis taken at this time will be accurate and representative of the underlying metal and is the basis for figuring the final ferroalloy additions.

Non-Removal of All Oxidizing Slag

There is one essential point regarding the above process which cannot be emphasized too highly; that is the importance of the removal of all of the oxidizing slag before the deoxidizing slag is added to the bath. If some of the first slag be allowed to remain on the bath when the second slag is added, the phosphorus which is being held suspended in the first slag as phosphorus pentoxide will be liberated because of the fact that the carbon in the second slag has a greater chemical affinity for oxygen than does the phosphorus. Carbon dioxide will be formed and the phosphorus thus liberated will once more enter the steel, and probably raise the phosphorus content above the desired specification.

The following actual example will illustrate this fact in a very marked manner: The writer was called upon to meet a specification of 0.020 per cent phosphorus or under and the only available scrap for the purpose was automobile turnings, which during the period of the war were actually analyzing as high as 0.11 per cent phosphorus. Needless to say that it required anywhere from two to five oxidizing slags to bring the phosphorus to a point within reason. We found that it was necessary to get a phosphorus test analysis of 0.008 per cent to 0.01 per cent before we could proceed with the heat because, when the slag under which this test was taken was removed and the deoxidizing slag added, we found that the average pick-up of phosphorus was enough to bring the final phosphorus analysis just within the specification of 0.020 per cent in many instances. This increase was due to the liberated phosphorus from the oxidizing slag, brought down into the bath by the carbon in the deoxidizing slag, as certain portions of this slag adhere to the banks and are next to impossible to pull out of the furnace.

Gray Iron Castings and the Basic Furnace

The higher the carbon content the easier it is to obtain the white or desulphurizing slag. This is one of the reasons why the basic electric furnace is an ideal means for making pig iron, malleable or gray iron castings in view of the fact that high sulphur cannot exist in the presence of high carbon on a basic bottom. Thus iron practice in the basic electric furnace resolves itself into one operation, namely, that of removing the phosphorus. At this point, however, we encounter considerable difficulty in some instances because the removal of phosphorus cannot be facilitated to any high degree in the presence of a high carbon content. Hence in the manufacture of irons where it is out of the question to secure a low-carbon melt, a low phosphorus scrap for charging must be resorted to, and iron practice in general becomes a melting and recarburization process.

In making the ordinary grade of medium steel for castings on a basic bottom it is seldom necessary to use more than one slag, provided a good quality of scrap is used in which the phosphorus analysis shows a basic specification. In some cases, however, where the melt down shows a dirty slag, it is often advisable to remove this slag, as the white slag has a tendency

*In the issue of July 27, p. 201, the author discussed the choice of an electric furnace; in the issue of Aug. 3, p. 277, the economy features of electric foundry design and equipment, and in the issue of Aug. 10, p. 345, acid electric furnace practice.

to make a quicker appearance under these cleaner working conditions.

High and Low Tap Secondary Voltage

Some of the present day furnace builders have their equipment so designed as to supply the secondary voltage at two distinct values, or high and low tap as they are respectively termed. This feature has a decided advantage for basic operation in that it permits the use of a short arc on the low tap connection which is made use of after the heat has been melted and the deoxidizing slag has been added. With the lower voltage a better control of the metal temperature is assured, resulting primarily in longer life of the refractories due largely to the fact that the short arc, being partly smothered by the puffy basic slag, causes considerable less reflection on the roof and side walls. On the other hand, the long arc caused by the high tap connection is stronger and tends to scatter the slag away from the ends of the electrodes, thus baring the metal in spots and causing a stronger reflection to play on the roof and side walls which will tend to make them drip in a short time, to say nothing of burning the carbon out of the deoxidizing slag as can be readily seen by the dense black smoke which arises through the electrode eyes. With the proper adjustment on the switchboard rheostats, the heat can be held under the short arc for an indefinite period without detrimental effect on the refractories.

Basic electric furnace practice differs greatly throughout the country, and it is rare to find two shops who make use of identically the same practice. This is due in many instances to the difference of opinion of steel melters, local conditions as applied particularly to the scrap market, and the class of work handled by the various shops.

Passing Rivets with a Rivet Gun

The accompanying illustration shows a Penflex rivet gun of the Pennsylvania Flexible Metallic Tubing Co., Philadelphia, in use at the yard of the New York Shipbuilding Co. The components of the rivet passing outfit shown are a compressed air tank, a foot treadle mechanism to release the air, a compressed air inlet, shown at the right side of the tank; a head or body into which the rivet is inserted; metal tubing for transmitting the hot rivets, and a receiver into which the rivets are shot.

The Heated Rivet Being Placed on the Valve, Which Re-closes Automatically. Pressing the foot lever shown releases the compressed air and sends rivet on its journey

The gun and the forge are conveniently located in an out-of-the-way place and the tubing led to the job. As each rivet is heated and ready to be passed it is set by the heater on a valve provided in an opening contained in the head of the gun. The rivet opens this valve by its own weight and enters the machine. The valve recloses automatically and the rivet is sent on its journey simply by pressing the foot treadle. The latter operation releases the compressed air, which has been supplied to the tank, into the head of the machine, and speeds the hot rivet through the flexible tubing. The rivet is shot into a receiver at the other end, where the holder-on removes and inserts it in the hole.

The rivet gun has a distance capacity of 125 ft.. delivering rivets up or down at the rate of 50 ft. every three seconds. It is claimed that the gun has even exceeded this performance, shooting rivets 180 ft. in nine and a fraction seconds without subjecting the rivets to change in temperature.

One of the outstanding advantages afforded by this equipment is that it eliminates the necessity of placing rivet forges in closed compartments, keeping the fires and their fumes out of closed places to the benefit not only of the riveting gang, but also of other workers there. Delivering heated rivets to points of operation difficult for direct passing facilitates work in inaccessible places, and passer boys are not needed. As to air consumption, data furnished would indicate that this equipment does not materially increase the total requirements of compressed air per rivet on new construction and a substantial reduction in rivet passing costs is claimed by the makers. Prevention of a high percentage of accidents in bridge building and structural work caused by faulty rivet passing is also a feature. The equipment is particularly adaptable to building steel masts in place.

Agents for Caucasian Manganese Ore

The Association of Manganese Ore Miners of the Caucasus, in which the Georgian Government holds a substantial interest, has appointed the Iron & Ore Corporation of America, 11 Broadway, New York, agent for the United States for all manganese ore coming from the Caucasus. Paul G. Leoni, president of the company, who recently returned from a two months' business trip to Europe, told in an interview with THE IRON AGE of having completed negotiations by which the Iron & Ore Corporation of America will handle all sales of Caucasian manganese ore and manganese dioxide in the United States.

Under the regulations of the Georgian Government, which controls the manganese fields in the Caucasus, all exports must pass through the Association of Manganese Ore Miners of the Caucasus, in which the government holds a substantial financial interest. Three cargoes of manganese ore, with an average analysis of 53 per cent manganese, were delivered at Baltimore in July.

Fuel oil is now being employed by the N. & G. Taylor Co., at its open-hearth furnace plant at Cumberland, Md., and by running emergency pipe lines to other departments of the works, it expects to reduce materially the need for coal. As it is, the company reports a stock of coal sufficient for full operation for six weeks and that changing over to using fuel oil will allow the plant to run several months with its present stock of coal.

Five 100-ton open-hearth furnaces are to be built by Alex Laughlin & Co., Pittsburgh, for the Wisconsin Steel Co., South Chicago. These furnaces are to be housed in an addition to the plant now in process of erection. The melting units are of heavy design, embodying modern features of regular furnaces.

Anti-Friction Bearings in the Steel Mill

Arguments For and Against Their Use—They Avoid Oil and Reduce Wear and Maintenance Cost—First Cost Is Heavier

BY A. M. MAC CUTCHEON

(*Concluded from page* 355, *Aug.* 10)

WHILE the history, manufacture and application or mounting of anti-friction bearings may be of interest to the engineer, the real question he wishes to consider is, what are the advantages of such a type of bearing, and what are the disadvantages. These are presented in summary form, compiled from information received from bearing manufacturers and from users of this type of bearing.

Advantages

1—Absence of oil. Steel mill electrical engineers have estimated that oil is responsible for 60 to 90 per cent of their

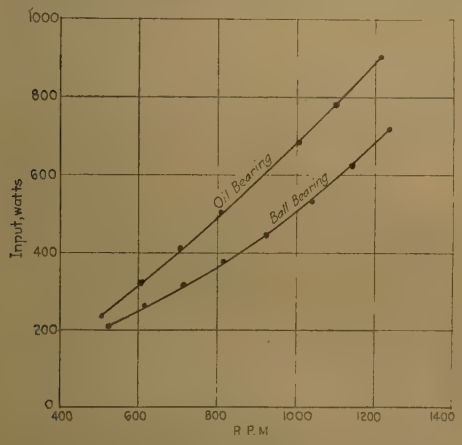


Fig. 11. Comparison of Losses Between a Ball Bearing and an Oil Bearing Motor. Each motor was 7½ hp., 230 volt, 800 to 2400 r.p.m.

motor troubles, causing injury to insulation, short circuiting of commutator bars, gumming of commutator, collecting dust and a general unsightly condition. The lubricant is more easily retained in a ball or roller bearing than in a sleeve bearing.

2—Reduction in maintenance cost. Much less frequent attention need be given to the lubrication of a ball or roller bearing. The weight of evidence received from users of anti-friction bearing motors is to the effect that failure of bearings is much less frequent than on oil-ring bearing motors.

3—Reduced wear of the bearing, resulting in less frequent renewal, due to the lowering of the rotor, and the consequent decreased air gap at the bottom. This consideration is of particular importance on induction motors, with their necessarily small air gaps.

4—Increased efficiency. A record was presented of a test on a 3-hp., 1800-r.p.m. induction motor. Three motors were used, one equipped with ring oiler bearings, another with waste packed bearings and the third with ball bearings. The test showed the following efficiencies:

Ring oiling bearing	81½ per cent
Waste packed	80½ per cent
Ball bearing	84 per cent

Figs. 11, 12 and 13 represent the results of tests conducted under the direction of the writer. In the first case, Fig. 11, two motors normally rated at 7½ hp., 850 r.p.m., with 9¼-in. diameter armatures, were at different times belt driven by the same motor. One machine under test was equipped with oil-ring bearings and the other with ball bearings; in all other ways they were identical. The watt input represents not only the friction and windage losses of the machine under test, but also the losses of the driving motor. However, since the driving motor was the same in each case, the difference between the losses will represent the saving of the ball bearing over the oil-ring bearing.

The second case, Fig. 12, represents a somewhat similar test conducted on three motors, normally rated 30 hp. at 850 r.p.m. Motors were identical excepting the bearings; one was equipped with oil-ring bearings, a second with Hyatt roller bearings and the third with Hess-Bright ball bearings. In this test the losses of the driving motor were deducted from the watt input, and the only inaccuracy is that the losses shown include the belt loss. It is interesting to note that, at slow speeds, the reduction in loss with the use of ball bearings is not nearly so apparent as at high speeds. It is further interesting to note that the loss with roller bearings falls between the loss with oil bearings and with ball bearings, and more closely follows the line of the oil bearing loss at the high speed.

The third case, Fig. 13, represents the test on the same three motors, showing the number of seconds that the armature would rotate after shutting off the power, plotted against the speed. The results in this test closely checked in quantitative value the tests represented in Fig. 12. Sufficient tests have not been made

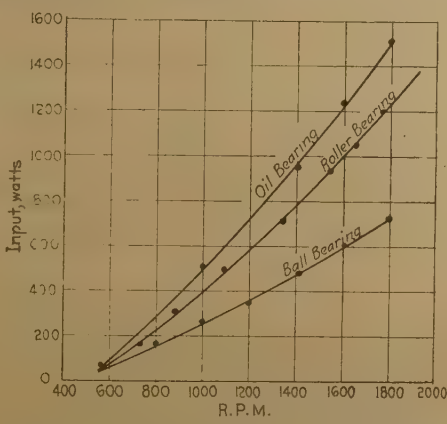


Fig. 12. Windage and Friction Losses of a Ball Bearing, a Roller Bearing and an Oil Bearing Motor. Each motor was 15 hp., 230 volt, 400 to 1600 r.p.m.

to present conclusive evidence, and many more should be conducted, but so far as the investigation has proceeded, it appears certain that motors equipped with anti-friction bearings save power.

5—A considerably decreased torque may be used at starting. In the case of an oil-ring bearing, sufficient torque must be applied to break the contact of the shaft on the bearing metal before the oil film is established.

6—Anti-friction bearings make possible a considerable reduction in the overall length and in the weight of the end housing. Babbitted bearings are usually designed with the bearing length 2½ or 3 times the shaft diameter, whereas the length of the ball bearings is usually not over one-third of the shaft diameter. A ball bearing manufacturer states that a tabulation of standard motor sizes

proves that the overall length can be reduced on an average of 15 to 20 per cent, by the use of ball bearings.

7—Information received from the railroads, the government and the steel mills, which have experimented with anti-friction bearings, indicate that these bearings have been successful; this experience should certainly be classed as a strong argument for the use of such bearings.

Disadvantages

1—Cost. The first cost of the motor will be greater, and two lines of motors will have to be manufactured, so long as the users of motors are not unanimous in opinion. A user changing to the anti-friction type of bearing, will have to carry two lines of spares until all of the oil-ring bearing motors have worn out or been replaced.

2—Difficulty in making replacements. It does not seem that it will ever be possible to replace a ball bearing so easily as an oil-ring bearing. To secure proper operation, it is necessary that the inner race be tight on the shaft, which prevents its easy removal. For steel mill operation, it

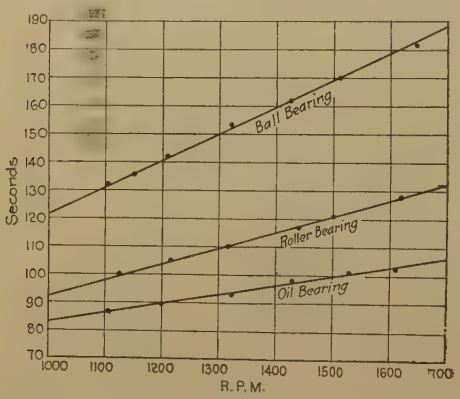


Fig. 13. Comparative Motor Drift of a Ball Bearing, a Roller Bearing and an Oil Bearing Motor, Showing the Period Taken by Each Motor to Become Stationary, After Power Was Shut Off, from Speeds of 1100 to 1650 r.p.m.

may be necessary to carry complete armatures with bearings assembled. This would certainly not be justified unless the reduction in the number of bearing troubles more than compensated for this extra expense.

3—The care necessary in successfully mounting anti-friction bearings and assembling the armature in the frame. The oil-ring type of bearing does not require the careful assembly needed with an anti-friction bearing.

4—It is essential very carefully to protect anti-friction bearings in handling and installation. This is readily recognized as a disadvantage in steel plants.

5—The workman in the steel mill is unfamiliar with the mounting of anti-friction bearings, and the assembly of such motors. This must be charged up as a disadvantage, until the average worker becomes sufficiently familiar with this type of motor to be able to disassemble it without difficulty or detailed instruction.

6—In cases of armature grounding, current may pass through the balls or rollers and the races, causing pitting; in extreme cases actually fusing the race to the balls or rolls.

7—Under emergency conditions, where a spare bearing is not available, the oil-ring type of bearing may be babbitted or cast by any reasonably good workman. This is not possible with the anti-friction type.

8—The strongest argument against the use of the anti-friction bearing, or any other device, is the fact that it has not been thoroughly proved under actual operating conditions. Whether or not the anti-friction bearing will stand up as well as the oil-ring bearing under shock and unusual load conditions has not yet been conclusively demonstrated. Until the case for the anti-friction bearing has been firmly established, it must be recognized as being on trial.

Experience in Steel Mills

Some experience has already been gained by certain steel plants, and with their permission specific reference is made to their experience. The list is not complete.

The Youngstown Sheet & Tube Co. has equipped several crane motors with roller bearings. The company has also changed certain other motors over to ball bearings, and has bought some ball bearing motors. Experience so far has been satisfactory. The engineers feel that there are certain advantages in the use of anti-friction bearings, and so far have experienced no trouble, but do not feel that the bearings have been in operation sufficiently long to determine definitely that they are entirely satisfactory in heavy steel mill service.

The National Tube Co. has in operation at McKeesport a few small vertical motors with ball thrust bearings, which have given good satisfaction.

The Bethlehem Steel Co., Bethlehem, Pa., has replaced sleeve bearings with ball bearings on a motor driving a shear. Trouble with the sleeve bearing occurred, due to the fact that at each operation of the shear a shock was transferred back to the motor, and caused the oil to be forced out of the bearing, allowing it to run dry. Ball bearing motors have performed very well on the service. The company has also applied ball bearings to motors used in connection with grinding tools, where it was necessary to operate the motor in positions such that the oil would run out of the oil well. This application has been in operation for two years without any attention.

The electrical engineer feels that the success or failure of ball bearings in connection with motors depends largely on using balls of ample size to carry all pressure, and feels that a double row of balls should be used. The only argument that he advances against ball bearings is that, in case of failure, the bearing must be replaced with an entirely new bearing, or at least with a new set of balls. If the spare parts were not available, the motor would have to shut down, whereas if the sleeve bearing were used and no spare were available, it would be a comparatively simple matter to take out the old bearing, rebabbit and put it back into service. This, however, he considers to be offset by the fact that the sleeve bearing will wear out in a much shorter time than the ball bearing. With proper attention to the selection of the bearing, anti-friction bearings can be used probably more successfully than sleeve bearings.

The Carnegie Steel Co., Duquesne works, has equipped a number of motors with anti-friction bearings, and the experience gained in operating these motors over a period of two to six years indicates that troubles have been almost negligible. These have been caused, first, by the grounding of direct current armatures, making the ball races of bearings paths for the current, resulting in some cases in pitting the bearing, and in other instances in the complete welding of the bearing into a solid mass; secondly, the use of improper grease, which has destroyed the bearing surface. This company feels it desirable to inclose the anti-friction bearing completely in a cartridge.

The Illinois Steel Co. at Gary has installed a number of Hyatt roller bearings, which have given splendid results. The electrical engineer at this plant thinks that it would be a good thing to equip all constant speed motors with ball bearings—especially the induction type.

The value of crude materials imported for use in manufacturing was 35 per cent greater in June this year than in June, 1921, indicating again the activity of manufacturing, for the ratio for the month of May this year compared with May, 1921, was 34 per cent. The imports of "manufactures for further use in manufacturing" were valued at 75 per cent more in June than they were in June a year ago. This shows an increase over the high ratio for May, 1922, and May, 1921, of 164 to 100.

British unemployment during the first half of 1922 averaged 16.4 per cent, as measured by trade union returns compiled by the Ministry of Labor. The figure for June, 15.7 per cent, was the best month of the six. It compares with 23.1 per cent for the previous June—the coal miners on strike at that time being excluded. The total number of workers registered as unemployed at the end of June was 1,455,000.

Serious Coal Problems Being Faced

Distribution Will Involve Many Difficulties Even if Miners' Strike Is Settled—Congress May Not Be Asked for Legislation at Present

WASHINGTON, Aug. 15.—Distribution of coal strictly in accordance with the priority rules of the Interstate Commerce Commission having been ordered by the Federal Fuel Committee, the iron and steel industry faces a critical situation unless negotiations for settlement of the coal strike in all the coal States are brought quickly to a successful conclusion. Hope is entertained here that this will come about, but even under this condition sight is not lost of the seriousness of the railroad strike situation that still exists despite efforts of the Administration to have railroad executives and shopmen come to terms. The attitude of the railroad brotherhoods has increased apprehension and left the entire matter at a point where it may have to be fought out. The announcement that the President will address Congress in a day or two does not mean necessarily that he will ask legislation, though labor evidently is attempting to bring about action from Congress that would be favorable to it as to restoration of seniority rights and other points at issue in the face of the fact that the President has suggested, with most of the railroads agreeing, that the question of seniority right be left to the Railroad Labor Board, a Government body.

If the Coal Strike Is Settled

Yet with a quick settlement of the coal strike, and the railroad situation remaining unchanged, Government officials have expressed the view that by careful distribution practically adequate supplies of coal could be furnished for all needs. While the priority classification of the iron and steel industry probably would remain as at present, with perhaps a higher rating as to certain products, such as tin plate, oil country goods, steel for car repairing and building, etc., it is thought it could be supplied sufficiently to insure good operations and permit resumption of idle furnaces and steel plants. The shortage of fuel, however, has become so acute that supervision of distribution for several months seems to be a foregone conclusion, no matter how soon the strike may be settled, either in whole or in part. While there is a belief among some that it will require a considerable time to re-equip some coal mines before they could resume normal production, the general opinion is that virtually all of them have been kept in good condition and could begin full production practically at once. This latter view is shared by Fuel Distributer Spencer, among others.

Shipments to Great Lakes

The first application of the priority rules on a large scale was made yesterday when it was decided to ship 12,000,000 tons of bituminous coal by the great lakes to the Northwest. The tonnage for the Northwest is to be shipped before the close of the navigation season, 250,000 tons to move this week, 400,000 tons next week and the remainder at the rate of 1,000,000 tons each week. The latter depends largely, however, on the assumption that union fields in Pennsylvania will be reopened soon, but is complicated by the possibility of Pennsylvania State authorities making claim for some of the tonnage for that State. The shipment of such large tonnage to the Northwest will mean the taking of coal from districts which supply large quantities to the iron and steel plants. The estimate made is said to be conservative, however, and was arrived at by a delegation comprising members of the Northwestern Coal Dock Operators' Association and members of the Minnesota State Fuel Committee who presented the fuel requirements of five Northwestern States to Mr. Spencer last week. Distribution of lake cargo coal is in charge of C. E. Tuttle. Victor Palmer, of the Rice Coal Co., Cleveland, has been appointed as adviser to Mr. Tuttle.

Mr. Spencer said yesterday that it has been definitely decided to give coal to by-product coke ovens which serve public utilities with the provision that the coke may be taken over for distribution for domestic consumption. While there are comparatively few by-product plants serving public utilities, it is plain that even these, when connected with steel works, might be unable to keep their coke.

A great deal of the time of Mr. Spencer has been taken up in conference with users of coal whose necessities were declared to be such as to make it impossible for them to go through the routine of application to governors' committees and in conference with representatives of such committees. Orders for distribution of coal have been issued as the result of representations made by some of the conferees speaking for municipalities, etc. The Dominion of Canada has become a party to the arrangement for controlled distribution of coal following the conference of Canadian representatives who informed Mr. Spencer that Canada would co-operate to the extent of its ability and would undertake to distribute coal allotted to it. Mr. Spencer said that Canada is shipping some coal to the United States.

Needs of Public Utilities

Estimates have been made by the Geological Survey that public utilities east of the Mississippi River would require 765,000 tons of coal weekly and that railroads in that section would require 2,000,000 tons each week. At the rate of production of about 3,800,000 tons weekly east of the Mississippi River, there would be left a little more than 1,000,000 tons a week for distribution among food and feed producers, handlers of perishable goods, live stock, ice plants, and coke and fuel oil plants. The production is but 38 per cent of normal and it is recognized that the output must increase greatly if the plan of distribution is to be worked out satisfactorily and production of industrial plants, including iron and steel, is to be increased rather than further curtailed.

Users of Coal Object

Users of coal in various parts of the country have already shown strong inclination to deny the authority of the Presidential Distribution Committee to take contract coal from them and divert it to other consumers, but there has been no denial of the power of the Interstate Commerce Commission to prescribe priority and preference for the supplying and moving of cars loaded with coal where there might be a conflict with coal contracted for by so-called essential users. At the same time, doubt has been expressed by some as to the right of the commission to say that where there was no transportation disability, a mine operator should decline to furnish coal on a contract say to an automobile plant unless the operator had supplied coal to a food plant with which he had no contractural relations and would not have except through a committee appointed by a governor. A conflict also has risen between preferred users. Attorney General Daugherty has rendered a decision that coal orders under priority class 1 have preference over coal produced on contract made before the issuance of service order No. 23 between a mine operator and a public utility which is also a preferred user. These questions involve the duty of the mine operator as to the order in which he shall load coal in cars set by the railroads in accordance with the Interstate Commerce Commission's orders. The

Presidential Committee has stated in an announcement that "while it is desired to preserve the integrity of contracts as far as possible, the feeling is that general contracts must, in a measure, take secondary position to the meeting of particularly urgent coal necessities created under an exigency which has arisen since such contracts were entered into.

"Present plans of the Fuel Distribution Committee are that orders for class No. 1 coal shall be so distributed as not to disturb seriously the proper distribution of cars. All orders for coal considered to be within that classification will go to the district committees, which will apportion the orders among the mines in their districts."

Ford Railroad Hauls Coal to Detroit

DETROIT, Aug. 12.—Priority rules, which the Federal Fuel Administration at Washington has undertaken to enforce, make no provision for the continuance of operations of the automotive and allied industries, according to a statement issued today by William W. Potter, Michigan fuel administrator, upon his return from a conference at Washington with Federal Administrator H. B. Spencer. The statement occasioned considerable uneasiness here, as the bulk of Michigan's industrial employment is dependent upon the operations of the motor car and accessory factories. The question now being asked is how long will the motor industry be able to continue under available power resources?

The Detroit Edison Co. this week carried one of the heaviest power loads in the history of the company, indicating that most of the factories of the metropolitan area of Detroit are using Edison power to conserve their own fuel. The Edison company has 20 days' supply of fuel on hand not subject to priority rules and which will allow the company to give capacity service over that period.

Should motor car factories be forced to suspend operations, it is not likely that such action would be necessary much before Sept. 15 or Oct. 1 and this would not be a serious matter, except for the unemployment of workers, as the early fall months are among the months of the slack production season in the industry.

An arrangement has been consummated by the Detroit, Toledo & Ironton Railroad—Henry Ford's line—and the Chesapeake & Ohio whereby a large portion of the 600,000 tons of coal accumulated on the C. & O. tracks is being released for delivery to Michigan subject to priority rules of distribution. The coal will be handled by the D. T. & I. at the rate of 200 cars a day, as the Ford road minimum wage of $6 a day has kept all its workers on the job and it is not affected by the strike. The shipments will be distributed to public utilities, food and ice manufacturers of the State and a certain percentage designated for transfer at lake ports for reshipment by boat to other States.

With the Edison company taking care of its present power requirements, manufacturers in the Detroit area are immediately concerned with the problem of obtaining sufficient cars in which to move in raw materials and send out finished products. The car scarcity is becoming more acute each day owing to the constantly accumulating number of bad-order cars.

There is little indication, thus far, of a letting down of employment. John L. Lovett, manager of the Michigan Manufacturers' Association, says that there are approximately 7500 men out of work among the factories of the State and that 5000 of them are in Detroit as a result of curtailed operations. This he attributes to inability of manufacturers to obtain shipping facilities.

Chester M. Culver, manager of the Employers' Association of Detroit, reported, this week, 181,733 men employed by the 79 firms in the association. This is a decrease of 686 men compared with the previous week. He declares this slight loss is due to refinement of production methods rather than to the fuel or rail strike effects.

Secretary of Commerce Herbert Hoover informed Detroit newspaper representatives in Washington that Ford's railroad would not be permitted to haul any more coal to Michigan than the State is entitled to in spite of the fact that the D. T. & I. is unaffected by the strike. He declared that the D. T. & I. must work collaterally with the other railroads of the country under the supervision of the Government, for the good of all.

Approximately 250 cars of fuel are reaching Detroit daily from the Kentucky fields. The average requirements are about 500 cars a day, exclusive of railroad fuel.

Improvement in Conditions

WASHINGTON, Aug. 15.—Gradual improvement in traffic conditions on railroads serving non-union fields, together with slightly greater output in fields heretofore slowed down by the strike, resulted in an increase of 500,000 tons of soft coal during the nineteenth week of the strike (Aug. 7-12) when production, according to returns so far received by the Geological Survey, was estimated at 4,800,000 net tons. Even with this increase, production is still about 550,000 tons below the level reached before the shopmen's strike. There have been only very small gains in a few of the more strongly organized districts and the increase in shipments reported has come from those districts in which production was curtailed by traffic congestion during July. Mine reports confirm evidence of railroad shipments that the response to the invitation to reopen mines has been practically confined to the non-union districts of Pennsylvania and to the more weakly organized districts of West Virginia.

The growing scarcity of coal was reflected in a decrease in the output of by-product coke in the month of July. The total production for the month was 2,486,000 net tons, against 2,580,000 tons in June. The daily average production declined from 94,000 tons in June to 80,182 tons—a decrease of 7 per cent. The ovens were operated on the average at 67.7 per cent of capacity. Of the 71 plants, 58 were active and 13 idle.

In spite of the decrease as compared with June, the July rate of output was within 3 per cent of the average for 1920, the year of maximum output. The by-product plants of the country continue to be called upon to make good the deficit of beehive coke caused by the strike in the Connellsville region and elsewhere. The beehive ovens produced only 450,000 tons in June. The total output of all coke was thus 2,936,000 tons or 68 per cent of the 1920 average.

More Suspensions at Youngstown

YOUNGSTOWN, Aug. 15.—In the Youngstown district, the steel industry is marking time, pending termination of the coal miners' and railway shopmen's strike. In some quarters there is inclination to feel that the industry will show early recovery upon adjustment of the labor difficulties. In view of depleted coal supplies, affecting all grades, producers are resorting to fuel oil and natural gas wherever possible. The Republic Iron & Steel Co. has begun the use of crude oil as a fuel in its open-hearth furnaces, several units being fired exclusively with oil. The Youngstown Sheet & Tube Co. has resorted to this substitute with satisfactory results. Open-hearth furnaces of the Brier Hill Steel Co. are equipped for using natural gas, which is proving a very acceptable substitute.

Inability to maintain coke supply has obliged the Sharon Steel Hoop Co. to bank its blast furnace at Lowellville, Ohio. For some time the company has been endeavoring, without success, to cover on additional coke requirements, necessary to keep its furnace active. This suspension reduces the number of active independent stacks in the Mahoning and Shenango Valleys to four, and a total of 14, including Carnegie Steel Co.

furnaces, out of 47 in both valleys. No. 2 blast furnace at the Farrell, Pa., works of the Carnegie company has been ordered on the inactive list, which will again reduce the number of furnaces pouring by one.

Other suspensions include the Lower Union mills of the Carnegie company at Youngstown and the rod mill of the American Steel & Wire Co. at Farrell. All of the 88 puddle furnaces at the Girard plant of the A. M. Byers Co., Pittsburgh, are cold. The skelp mill at this property was scheduled to operate until Wednesday, when the plant goes down until transportation and coal supply improve.

Partially offsetting these curtailments are the resumption of the Bessemer department of the Sheet & Tube Company, the 132-in. plate mill of the Brier Hill Company and the operation of four bar mills at the Brown-Bonnell works of the Republic Iron & Steel Co., which were idle the past week.

It is, therefore, evident that operations are wholly dependent upon fuel supply. Steel making by the open hearth process continues virtually without change, except that one less unit is active at the Lowellville plant of the Sharon Steel Hoop Co. Of the 66 open hearths in the Mahoning Valley, 48 are charged, of which 34 are being operated by independents.

Sheet and tin plate schedules continue with little change, 106 of 113 sheet mills being scheduled at the beginning of the week, and 13 of 17 tube mills. This number is subject to fluctuation, of course, before the week is over.

Increased Production in Connellsville Region

UNIONTOWN, Pa., Aug. 12.—Notable increase in production has marked the situation in the Connellsville bituminous district. Shipments over the southwest branch of the Monongahela railroad set new records twice this week since the strike developed on April 1. Peak was reached yesterday when shipments over this branch were 441 cars of coal and 180 cars of coke.

Production in the Connellsville region for the week ending Aug. 5 was 75,370 tons, an increase of 2760 tons over the preceding week. Total production in the region since April 1 is 1,372,130 tons. Estimated production of coke during the week ending Aug. 5 was 75,370 tons. One hundred and twenty-nine ovens were added to the active list, 111 of these being at plants of the Frick Coke Co.

Efforts of the State Administration through cooperation with the Hoover commission to fix prices of coal are being resisted strenuously on the part of operators in the region. The Fayette County operators are opposed to the fixing of prices unless at a point sufficiently high to protect them against the risks which are being taken in the operation of their plants. Some of the operators point out that riot and strike emergency insurance rates are so high as to preclude policies on large plants and that the risk of such damage to the plants must be borne by the operators.

Publication here of stories under Cleveland date line that the union leaders were planning to desert the men in this region who have affiliated with the union has drawn sharp reply from union organizers. A statement signed by John O'Leary, William Hines, John D. Fagan and William Feeney declares that the union men in this region will never be deserted and that with a settlement in union fields the full power of the union will be directed back of the men in this region. Reports from Cleveland are at variance with this view.

There is very little spot coal or coke in the region, practically all of the production being shipped on consignment. Coal prices for available spot, however, are as high as $12 a ton; coke up to $15 a ton.

Two miners shot from ambush at plants in the region during the week died from their wounds.

While the production has been showing a steady increase, it is due almost entirely to the work of men imported into the region.

The county this week was brought to face an outbreak of typhoid fever in the tent colony of miners at Palmer. Eighteen cases have been admitted to county hospitals from this colony and two from a tent colony at Adah. State department of health officials have begun an investigation of all tent colonies in the region. The epidemic is attributed to polluted streams and springs. Arrangements for pure water supply were made at Palmer. So far the epidemic has been confined to that at Palmer and the two cases from Adah.

Regional Requirements of Coal

WASHINGTON, Aug. 10.—The problem of transporting coal supplies from Kentucky and the Virginias up the Great Lakes before the suspension of navigation is being given serious attention by the Federal Fuel Committee. A tentative figure of 250,000 tons per week has been agreed upon for immediate movement, but this figure may be changed at any time as the situation may be reflected in the daily figures on coal production and movement. Members of the Michigan State fuel committee have been in conference with Fuel Distributor Spencer regarding the acute fuel situation in that State.

An estimate of 765,000 tons of bituminous coal weekly as being required to meet the immediate needs of gas and electric public utilities and domestic consumers in the territory east of the Mississippi River is made by the United States Geological Survey. Of this amount, New England would require 9.2 per cent; the non-coal-producing states of the coast region exclusive of New England, 21.6 per cent; coal-producing states of the coast region, 22.9 per cent; and Ohio, Indiana, Illinois and Michigan 46.3 per cent. Railroads in the same territory will require 2,000,000 tons weekly, making a total emergency requirement of 2,765,000 tons. Coal is now being produced in this territory at the rate of 3,800,000 tons weekly.

The railway mechanical situation on coal-carrying lines in the Virginias, which has been hampering the shipment of coal, continues to improve with the importation of mechanics from eastern and western lines. The requirements of the Chesapeake & Ohio and the Norfolk & Western systems are said to have been practically met, and mechanics are now being diverted to the Virginian Railway. Shipments of coal from southeastern Kentucky are being retarded to some extent by conditions at Corbin, Ky., where more than 300 railway mechanical employees are said to have left their employment because of threats of violence. An unusual situation prevails in the western Kentucky field, where coal production is accelerated by the existence of a 100 per cent car supply.

Increase in Car Shipments

WASHINGTON, Aug. 15.—An increase in the number of cars that are being loaded daily with coal is shown by reports issued by the railroads. On Monday, Aug. 7, these reports showed that a total of 16,021 cars were loaded with coal. This total has been exceeded on only seven days since the miners' strike started on April 1, and then only by an average of a few hundred cars.

The number of cars loaded daily with coal on American railroads since Aug. 1 follows: Aug. 1, 11,783; Aug. 2, 12,218; Aug. 3, 12,177; Aug. 4, 12,505; Aug. 5, 12,317; Aug. 7, 16,021.

In August, 1921, the average number of cars loaded daily with coal was 23,688.

Reports showed that on the Chesapeake & Ohio, Norfolk & Western and Louisville & Nashville, the three largest coal-carrying railroads, in the West Virginia and Kentucky non-union fields, 7,554 cars were loaded Monday, Aug. 7. These three roads in June averaged 7,373 cars daily, which was the heaviest month's coal loading in their history.

All the lower floor positions have long since been sold out for the 1922 exposition of chemical industries which will be held at the Grand Central Palace, New York, Sept. 11 to 16, and spaces on the third and fourth floors are at a premium. With over 400 firms already signed up, there is little doubt but that the first four floors of the Grand Central Palace will be crowded with exhibitors during chemical exposition week.

United States Pig Iron Production for First Half of 1922

The American Iron and Steel Institute in its special statistical bulletin No. 4 gives the production of all kinds of pig iron in this country for the first six months of the present year. The total is 12,191,011 tons, which compares with 9,530,981 for the first half of 1921 and 18,435,602 for the first half of 1920. For the first time, there was no production of anthracite and mixed anthracite and coke pig iron. There was no production of charcoal pig iron in the group composed of Massachusetts, Connecticut, New York and Pennsylvania. Of the total 84,786 tons of charcoal, the group composed of Michigan, Wisconsin and Missouri produced 71,333 tons.

HALF-YEARLY OUTPUT OF PIG IRON BY STATES.

HALF-YEARLY PRODUCTION OF ALL KINDS OF PIG IRON

States.	Blast furnaces.*				Production—Gross tons. (Includes spiegeleisen, ferro-manganese, ferro-silicon, ferro-phosphorus, etc.)		
	In blast Dec. 31 1921.	June 30, 1922. In.	Out.	Total.	First half of 1921.	Second half of 1921.	First half of 1922.
Maine	0	0	0	0			
Massachusetts	0	0	1	1	1,537	605	
Connecticut	0	0	2	2			
New York	10	13	14	27	506,113	462,547	833,488
New Jersey	1	1	3	4			
Pennsylvania	46	69	92	161	3,577,570	2,675,196	4,339,560
Maryland	1	4	3	7	75,130	72,059	140,885
Virginia	0	0	17	17	53,519	13,720	
Alabama	13	22	21	43	659,225	548,183	963,019
Georgia	0	0	3	3			
Texas	0	0	1	1			
West Virginia	2	2	3	5	117,215	147,544	240,822
Kentucky	1	2	5	7			
Mississippi	0	0	1	1			
Tennessee	1	2	15	17	12,369	7,110	17,585
Ohio	26	41	39	80	2,081,847	1,717,766	2,898,846
Illinois	9	16	10	26	1,030,801	581,232	1,237,877
Indiana	9	12	4	16	1,019,010	874,601	1,252,733
Michigan	4	9	4	13			
Wisconsin	1	3	4	7	211,574	15,289	102,809
Minnesota	0	2	1	3			
Missouri	0	0	3	3			
Iowa	0	0	0	0			
Colorado	1	3	2	5	185,071	41,293	163,387
Oregon	0	0	1	1			
Washington	0	0	0	0			
Total	125	201	249	450	9,530,981	7,157,145	12,191,011

*Completed and rebuilding.

HALF-YEARLY PRODUCTION OF COKE PIG IRON.*

Maine	0	0	0	0			
New York	10	13	13	26	507,108	463,152	833,488
New Jersey	1	1	3	4			
Pennsylvania	46	69	81	150	3,564,405	2,674,267	4,339,560
Maryland	1	4	2	6	75,130	72,059	
Virginia	0	0	17	17			140,885
Georgia	0	0	2	2	53,519	13,720	
Texas	0	0	1	1			
Alabama	11	20	20	40	655,693	539,074	949,566
West Virginia	2	2	3	5	117,215	147,544	240,822
Kentucky	1	2	5	7			
Tennessee	1	2	12	14	12,369	7,110	17,585
Ohio	26	41	39	80	2,081,847	1,717,766	2,898,846
Illinois	9	16	10	26	1,030,801	581,232	1,237,877
Indiana	9	12	4	16			
Michigan	2	2	2	4	1,060,523	874,860	1,256,880
Wisconsin	1	2	4	6			
Minnesota	0	2	1	3			
Missouri	0	0	2	2			
Iowa	0	0	0	0			
Colorado	1	3	2	5	289,612	40,646	190,716
Washington	0	0	0	0			
Oregon	0	0	1	1			
Total	121	191	224	415	9,448,223	7,131,430	12,106,225

*Includes ferro-alloys made with electricity, electricity and coke, etc.

HALF-YEARLY PRODUCTION OF ANTHRACITE AND MIXED ANTHRACITE AND COKE PIG IRON.

Pennsylvania	0	0	7	7	12,823	920	
Total	0	0	7	7	12,823	920	

HALF-YEARLY PRODUCTION OF CHARCOAL PIG IRON.

Massachusetts	0	0	1	1			
Connecticut	0	0	2	2			
New York	0	0	1	1	883	9	
Pennsylvania	0	0	4	4			
Maryland	0	0	1	1			
Alabama	2	2	1	3			
Georgia	0	0	1	1	3,532	9,109	13,453
Tennessee	0	0	3	3			
Mississippi	0	0	1	1			
Michigan	2	7	2	9	47,346	15,030	
Wisconsin	0	1	0	1	24,174	647	71,333
Missouri	0	0	1	1			
Total	4	10	18	28	69,935	24,795	84,786

TOTAL PRODUCTION OF PIG IRON ACCORDING TO FUEL USED.

Coke*	121	191	224	415	9,448,223	7,131,430	12,106,225
Anthracite†	0	0	7	7	12,823	920	
Charcoal	4	10	18	28	69,935	24,795	84,786
Total	125	201	249	450	9,530,981	7,157,145	12,191,011

*Includes ferro-alloys made with electricity, electricity and coke, etc.
†Includes mixed anthracite and coke pig iron.

HALF-YEARLY OUTPUT OF PIG IRON BY GRADES.

HALF-YEARLY PRODUCTION OF BASIC PIG IRON.

States.	First half of 1921.	Second half of 1921.	First half of 1922.
New York, New Jersey	199,568	189,342	428,536
Pennsylvania—Allegheny County	1,024,302	663,421	1,248,060
Other counties	736,305	605,273	1,100,324
West Virginia, Alabama, Kentucky	438,730	381,637	641,200
Ohio	685,788	540,009	1,257,315
Indiana, Illinois	1,149,432	824,744	1,534,969
Michigan, Minnesota, Missouri, Colo.	270,306	44,214	179,472
Total	4,504,431	3,248,640	6,389,876

HALF-YEARLY PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON.

New York	61,225	22,201	50,541
Pennsylvania	1,381,591	1,084,752	1,516,802
Maryland	74,660	46,839	193,115
West Virginia, Tennessee, Alabama	73,816	23,782	
Ohio	1,081,868	794,007	1,199,416
Indiana, Illinois, Iowa, Colorado	606,912	343,562	552,730
Total	3,280,072	2,315,143	*3,512,604

*Includes 60,372 ton of low-phosphorus pig iron.

HALF-YEARLY PRODUCTION OF FOUNDRY PIG IRON AND FERRO-SILICON.

Maine, Massachusetts	1,537	605	
New York, New Jersey	215,512	192,376	308,129
Pennsylvania	285,798	270,315	305,792
Maryland, Va., West Va., Ky., Tenn.	67,138	45,850	36,853
Alabama	241,091	279,007	459,563
Ohio	219,004	189,782	219,069
Indiana, Illinois	104,944	103,464	82,192
Michigan	118,110	100,301	130,763
Wisconsin, Missouri, Iowa, Colorado	122,265	11,037	86,868
Total	1,375,399	1,192,737	*1,629,229

*Includes 41,913 tons of ferro-silicon.

HALF-YEARLY PRODUCTION OF MALLEABLE PIG IRON.

New York	22,533	49,279	35,348
Pennsylvania	14,099	6,644	17,945
Ohio	62,267	155,843	195,036
Indiana, Illinois, Mich., Wis., Minn.	66,623	80,052	179,669
Total	165,522	291,818	427,998

HALF-YEARLY PRODUCTION OF FORGE PIG IRON.

New Jersey, Pennsylvania	13,280	23,832	65,845
Alabama	5,276	4,162	10,181
Ohio	30,381	35,817	26,858
Total	48,937	63,811	102,884

HALF-YEARLY PRODUCTION OF SPIEGELEISEN AND FERRO-MANGANESE.

Pennsylvania, Maryland, Ala., Tenn.	131,739	23,871	96,555
Illinois, Washington	4,530	38	
Total	136,269	23,909	*96,555

*Includes 69,482 tons of ferro-manganese and 27,073 tons of spiegeleisen.

HALF-YEARLY PRODUCTION OF OTHER GRADES.

New York, New Jersey	4,482	4,771	4,269
Pennsylvania	2,895	1,666	1,443
Maryland, Va., West Va., Tenn., Ala.	7,101	7,339	14,858
Ohio	2,539	2,308	1,152
Indiana, Illinois, Michigan, Wisconsin, Missouri, Colorado	3,334	5,003	10,143
Total	20,351	21,087	31,865

PIG IRON MADE FOR SALE OR FOR USE OF MAKERS IN THE FIRST HALF OF 1922.

Grades.	For sale.	For maker's use.	Total. Gross tons.
Basic	620,654	5,769,222	6,389,876
Bessemer and low-phosphorus	203,091	3,309,513	3,512,604
Foundry, including ferro-silicon	1,577,144	52,085	1,629,229
Malleable	318,723	109,275	427,998
Forge or mill	29,497	73,387	102,884
Ferro-manganese	30,529	38,653	69,482
Spiegeleisen	16,558	10,515	27,073
All other grades	16,246	15,619	31,865
Total	2,812,742	9,378,269	12,191,011

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Paying Toll to Railroad Workers

We have pointed out before, but the fact cannot be too much emphasized, in getting at the real inwardness of the present struggle between the public and the railroad unions, that the railroad workers insist on having an excessive share of the total return to the country's labor. Deflation, in the unions' view, may be well enough for farmers, steel workers, textile employees, and scores of other battalions in the great industrial army, but all that railroad labor was able to wrest in war time from the Government management of the railroad lines it proposes to keep.

The ordinary man among the 104 millions or more Americans apart from railroad workers and their families has found out in a score of ways how the demand of the railroad unions for the continuance of war-time wages, when wages in nearly all other employments have come down well below war-time levels, is affecting his own buying power.

High transportation cost is high railroad labor cost, and high transportation cost is entering into the price of everything the average citizen eats or wears, of the fuel he buys and of the house in which he lives.

The *Bache Review,* pointing out that the farmer did not respond to the labor leaders' plea, soon after the war, to join in the movement for political control by organized labor, cites the analysis of the situation recently made by President David Friday of the Michigan Agricultural College. He estimates that in 1921 railroad employees, who make up less than 4½ per cent of our total working population, received as wages nearly 7 per cent of the nation's purchasing power—that is, of the nation's total agricultural, mining and manufacturing product. The farmers, who make up more than 26 per cent of the total working population, received less than 20 per cent of the total national income. In other words, there were six times as many workers in agriculture as in railroad transportation, and yet they received only three times as much of the year's production as did the railroad workers. That means, in short, that the average return from railroad employment is twice as great as the average return from the pursuit of agriculture.

It is not to be expected, under such a distribution of the rewards of labor in the two employments, that the farming community will aline itself with the aims of the organized workers on the railroads. On such a basis, the farmers, in common with other large sections of the community, are working for the railroad unions, just as the vast majority of the 40 millions or more of our population engaged in gainful occupations have long been working also for the members of the building trades unions and the United Mine Workers of America.

Public Concern in Coal

The chief basis upon which the Government undertook to assert authority over railroad rates and practices, more than a third of a century ago, was that the railroads had been given the right of eminent domain. The fact that they performed a "public service" lay far in the background, but it has since come to the front. The view of what constitutes a "public service" has gradually expanded, for several reasons. One is that with improvements in methods of communication services become more public and less localized. Another is that the public realizes more and more that when society furnishes protection to an industry it is entitled to consideration in return. Yet another is that labor unions have been working in the direction of nationalizing their arrangements, railroad labor being conspicuous in this connection.

With all the talk, however, of Government control of the coal industry it is apparent that the public at large has a remarkably small amount of interest in the subject. It is familiar with coal prices represented by high multiples of a dollar; but how many persons remember that often before the war, and occasionally even after the war started, coal sold at a single dollar a ton? When a contest between employer and employee in the coal industry is staged, the general public is scarcely even irritated and it is certainly not aroused. When after four months of a coal strike

a factory here and there closes for lack of coal there is a little mild surprise, perhaps a faint regret that the factory did not lay in a bigger stock of coal or that the strike had not been confined to a period of three or four months.

Those who have given any study at all to coal realize what an uneconomical alinement has been built up; but that is not the general public. The general public suffers and does not realize that it suffers. It may well be asked why it should be anybody's duty to inform the public of its suffering. Experience has shown that executive action cannot be depended on to help matters in coal. There was a little judicial action a couple of years ago, but even this has hung fire meanwhile. There remains legislative action, which should depend upon public demand, but does not always promptly follow public demand. As a matter of plain fact, really public demand has been decidedly lacking.

It has been assumed in Washington that in an emergency like the coal strike the Government has authority to seize the coal mines and operate them, but it has been assumed at the same time that in that case the Government would pay miners practically the wages they asked. It is also assumed that by legislative enactment the Government can regulate the coal industry, provided it does not attempt "confiscation," which is a term not yet defined in dollars or per cent, even as to transportation facilities.

Government regulation of coal would rest upon a very plain and substantial foundation. The great percentage of coal mines exist by grace of the rail transportation facilities, which the Government has obligated itself to take care of. The Government wishes the public to have reasonable transportation service, but does not wish it to have to pay for the creation of unnecessary facilities. If part of the coal industry operates and part is idle, the public can be served with coal only by some roads having to haul unreasonably much coal while others have but a small proportion of the traffic. Backing the railroads, the Government has a right to demand that coal mining be fairly distributed geographically and in point of time. The Government has the right, but it is not likely to exercise that right unless or until the public at large calls out to it to do so.

The growth of the electric furnace steel industry of Italy since the war has been remarkable. According to the information on other pages, which is corroborated by private advices, there are now about 180 electric steel furnaces of various types and capacities in Italy. Thus the Italian industry has a place close to the front rank and is exceeded only by that of the United States. In 1914 the two countries were credited with about 20 furnaces each, according to the first review of this industry published by THE IRON AGE. While the United States to-day has over twice as many furnaces as Italy, the latter country has probably outrun both Great Britain and Germany. In output, also, Italy ranks high, production in 1920 having been about 100,000 tons and in 1921 about 140,000 tons, the United States alone producing more. In size, also, the Italian furnaces are noteworthy, there being several of 20 to 25 tons' capacity and 23 furnaces of 15 tons' capacity. The north of Italy has been the seat of the largest recent expansion. Cheap water power and other conditions have made such rapid progress possible.

The Key Place of Chromium

The need of a metal with unusual tensile strength at high temperatures and pressures, and also with good resistance to corrosion, has long been recognized. Industrial operations making such demands are many—among others, the production of ammonia, the use of superheaters in various industries, of pipe for oil-cracking operations, of steam and gas turbines and of internal combustion engines.

That the problem is being solved appears from the development in recent months of several alloy steels having exceptional strength at high temperatures and pressures, as well as anti-corrosive or non-oxidizing properties. Two articles printed in this issue throw new light on the subject, one dealing with stainless steel and the other with some special German alloy steels. The solution of the problems mentioned has been largely due to the employment of alloy steels containing chromium or chromium combined with other metals, such as nickel.

To such an extent has chromium functioned in this connection, and in other important uses, that it is not uncommonly spoken of as the master metal in the alloy field. To its familiar uses as an essential constituent of steels with maximum strength at high temperatures has been added more recently its notable performance as the foundation of the stainless steels and irons.

No standard high-speed steels are made without chromium. During the war, when tungsten was lacking for the making of permanent magnets, chromium filled the breach. It is the basis of many important alloy steels which have figured largely in the advance of the automobile and other industries. In simple heat-resisting alloys for heat treatment and other uses it has been the key to success. Moreover, recent experiments have shown that as an ingredient in certain non-ferrous alloys it has added greatly to their strength and ductility.

Yet with all this advance, to which the electric furnace and a succession of discoveries in heat treatment have contributed so largely, there are not lacking predictions whose plain implication is that the field of heat-treated chromium alloys has scarcely been scratched.

Ferromanganese imports are gaining in volume and in June reached a figure in excess of the pre-war record. In 1913 the average was 10,600 tons per month, but in June of this year 13,500 tons was exceeded and the July figures will be larger, many contracts having been placed with British makers because of the American fuel situation and also in anticipation of a high duty. Receipts of manganese ore, including several cargoes of Russian ore, are also expanding, having

been over 45,000 tons per month for May and June, a figure in excess of the average for 1913 or 1921. Despite the increased duty on the ore, should the pending tariff bill pass, these imports must of necessity continue in large volume, since American mines do not contain the grade or the quantity adequate to supply the American steel industry.

Less Iron Ore Per Ton of Pig Iron

Consumption of iron ore per ton of pig iron made was lower in 1921 than in any previous year in the record, which extends back to 1909. It may have been the lowest in the history of iron making in the United States. The showing is important, in view of the common impression that increasing leanness of our iron ores furnishes a problem.

The highest ore consumption shown in the record was in 1911, a year of light production, and 1912, a year of heavy production. Taking the average of 1911, 1912 and 1913, as constituting the three-year period before the war, the following showing is made, the figures being per gross ton of pig iron produced:

Ore, briquettes, etc., gross tons	1.871
Scrap, scale, etc., gross ton	0.134
Total, gross tons	2.005
Limestone, pounds	1156.7
Coke, pounds	2434.9

The consumption of ferrous material is the average for all pig iron produced, as the statistics do not segregate. The limestone is for coke furnaces only (and a negligible output of anthracite furnaces), the charcoal furnaces being excluded. The coke consumption is of coke furnaces only, excluding anthracite and charcoal furnaces, and is the average of 1912 and 1913, as statistics of fuel consumption were not gathered for 1911.

Consumption of iron-bearing material in 1921, as given in the annual report of the American Iron and Steel Institute, just issued, makes a very favorable comparison with the average of about nine years previous. In 1921 the average consumption of ore, etc., was 1.784 gross tons and of scrap, etc., 0.141 ton, making a total of 1.925 tons, representing a decrease of 4 per cent.

With a decrease in the consumption of ferrous material there was of course less impurity to be slagged off, and the limestone consumption accordingly fell, the 1921 average being 995.5 lb., representing a decrease of 14 per cent from the average of the years 1911-1913.

Concurrently with these decreases, a lessened consumption of coke would be expected. The coke dropped to 2200.6 lb., representing a decrease of 9½ per cent.

These evident savings are of no small consequence. Making guesses as to what should be considered normal values in present times, of the materials delivered at the typical blast furnace, the saving in raw material is found to lie in the neighborhood of $1 per ton.

It would require a much more exhaustive analysis than is possible with the statistics available, to determine the precise ways in which the average of blast furnace practice has been improved. One thing can be observed from the statistics, that Alabama has helped to improve the general showing. That State, which is quite separate from the rest of the industry, decreased its limestone consumption from 746 lb. in 1913 to 557 lb. in 1921, per ton of pig iron made, this being well below the average of the country, and at the same time slightly increased its contribution to the total pig iron output. This, however, is a relatively insignificant item.

In general, one is led to conclude that improvements of various sorts in blast furnace practice have done much more than to offset such decrease as has occurred in the iron content of the ores that must be used. As the decades pass the industry will be driven to use leaner and leaner ores, there being immeasurable quantities low down in the scale, and it is encouraging to note that up to date the technique of the industry has more than kept pace.

CORRESPONDENCE

Developing the Will to Work

To the Editor: In THE IRON AGE of July 20 I noticed an editorial on "A Better Philosophy of Work," which was as timely as it was interesting and true. It is only too true, as you say in the closing paragraph of the editorial, that we are most unfortunate if we are unable to discover new viewpoints concerning the social value of work—if you had that in mind when speaking of the philosophy of work. We have been spending much time, money and energy on symptoms, by sentimental welfare work and paternal care of the mental, moral, physical, educational and literary needs of the worker; all of which, I have often noticed, smacks too much of the feudalism of the Middle Ages and has a tendency to create antagonism between labor and capital instead of harmony and mutual confidence.

As a matter of fact, the craft guilds of the Middle Ages had a better way of appealing to the character of the worker and developing in him that philosophy of work which you seem to have in mind than modern industry has. In saying this I speak from experience, because the medieval guild system was still in vogue when I was a young man, the last vestige of the system being officially abolished in Germany in 1865. The governments of the various German states retained that system so long for the very purpose of extending to the growing industries of Germany their social-ethical features, not the least of which was the cultivation of respect for work as a civic virtue. As a member of a medieval guild from 1854 to 1865, with all that this implied in those days, I feel justified in saying that the rapid and sound development of the German industries during the middle of the last century and later was largely due to the inherited influence of the guilds.

For 56 years now, or since 1866 when I came to this country, I have been in intimate contact with the development of American industry, particularly during the more than 30 years of my connection with the Pennsylvania Railroad Testing Laboratory, and during the trying and critical transitory period from iron to steel. And I am compelled to say that American industries, particularly corporations and industrial combinations, have succeeded admirably in repressing those characteristics of human nature which would favor the cultivation of a philosophy of work such as you refer to in the editorial mentioned. Does not the present attitude of labor indicate a serious dislocation of social relations between capital and labor, between employer and employee? True, there are strikes in European countries, but, with the exceptions of the communists'

demands, the mass action of labor there has not the sinister aspect it has with us.

It has often occurred to me that our technical journals have devoted themselves so exclusively to matters of the technique of machinery and processes and the mechanism of industrial organizations that they have lost sight of the interdependence and interrelations of the industrial fabric with the social structure. Industrial management needs a revival along social, not socialistic, lines as much as the worker. Technical progress has been so rapid and so destructive of the older social relations in society that the slower moving social evolution has been unable to keep up with the new requirements. Mass production and quantity requirements have overshadowed the ethical demand for social self-preservation. How long can we go on that way without even more serious disturbance of industrial, social and economic relations?

PAUL KREUZPOINTNER.

Altoona, Pa., Aug. 12.

JAPANESE MARKET QUIET

Competition from India in Pig Iron—Steel Market Weak—Copper Fairly Firm

TOKIO, JAPAN, July 10.—In the Japanese steel market quietness rules, but there are noticeable signs of improvement. Prices have ceased to fall away substantially. Unexpected business in the cocoon trade for several weeks is assisting credit in the provinces and inquiry for materials from provincial builders is on the increase. Efforts to stabilize the market on the part of importers and leading holders of stocks are having their effect. Prices, which have been weak, now stand unchanged. Round bars are quoted at 4.60 yen per 10 kwan (2.68c. per lb.), flats and squares at 4.90 yen (2.83c. per lb.) and plates at 7 yen (4.05c. per lb.). Tin plates are in an unfavorable position, packers who were expected to buy heavily showing no inclination to come into the market.

Company Has Orders Until 1924

That sufficient orders are on hand to keep the plant in full operation until 1924, with the full force of 20,000 workmen, and that an annual dividend of 15 per cent will be paid was definitely announced in a recent address by the president of the Kawasaki Dock Co. of Kobe at the semi-annual meeting of the shareholders. Orders have been received by the company for the building of five submarines, one light cruiser and two naval special service boats, all, it is stated, within the bounds of the Washington Conference limits. In addition, the company has received orders for 112 locomotives, 200 passenger cars and 252 freight cars. The chairman added: "Since our company holds several foreign electric patents we shall soon begin turning out electric machinery and apparatus for the electric industry of this country, which is still in an undeveloped condition."

Tenders for electrolytic copper are to be received at the Tokio Arsenal, and in anticipation the market has tended upward for the past few days, the quotation standing at 45.60 yen and 45.70 yen per 100 kin. (16½c. per lb.). The tone of the Osaka market is also fairly firm. Of late the price of electrolytic copper differs about one yen between the Tokio and Osaka markets. When tenders were last called, the Tokio Arsenal stipulated quality of 99.96 per cent pure, taking the Japanese electrolytic copper as a standard, but in the coming tender the Arsenal has altered the stipulation of quality to the American electrolytic copper as standard, and, therefore, it is supposed that some importers of American copper in Japan will participate.

Steady Importation of Indian Pig Iron

The pig iron market is dull. The price is prevented from decline only by the limited quantity of stocks. In the Tokio market some consumers are in financial difficulties. No. 1 Kamiasha is quoted nominally at 70 yen ($33.50) per ton, No. 1 Wanishi at 67 yen ($32.05) per ton, and No. 1 Rayang at 65 yen ($31.10). Indian iron is offered at still lower prices, and forms a menace to the market, arriving at the rate of 5000 to 7000 tons per month. Tata iron is quoted at 61 yen ($29.20) per ton, and Bengal at 60 yen ($28.72) per ton. The importation of pig iron into Japan from Europe and the United States is now practically impossible. American iron is out of stock in Tokio, while Cleveland (England) is quoted at 78 to 80 yen ($37.34 to $38.30) per ton.

German Trade with Japan Increasing

Indications of Germany's rapid recovery from the war may be seen in her trade relations with Japan. Imports by Japan from that country have been so heavy lately that Japanese manufacturers are complaining and seeking protection. German products, they state, are selling at prices lower than the Japanese market, especially in steel, machinery and dyes. German steel exports to Japan are showing up well, while America's exportation is on the decline, and Great Britain's record is slightly better than in the previous year.

Workmen's Compensation Laws from the Physician's Viewpoint

The relation of the physician and his industrial work to workmen's compensation laws is among the subjects considered in the report recently issued by the National Industrial Conference Board, 10 East Thirty-ninth Street, New York, for the Conference Board of Physicians in Industry, which acts as advisor on industrial medical problems to the former organization.

It is pointed out that although the effective administration of workmen's compensation laws depends in large measure upon the work of medical men, Washington is the only State to give a physician membership in its industrial commission by legal enactment. In that State the medical member is chairman of the board.

Compensation for hernia is discussed in the report by Dr. S. M. McCurdy, Youngstown Sheet & Tube Co., who expresses the opinion that hernia is seldom due to occupational causes, but is produced by the aggravation of a condition present in the majority of persons from birth. He states that hernia should be considered as an occupational disease rather than as an industrial accident and cured by surgical treatment. It is emphasized that a worker with hernia should not be denied employment but, after examination, should be placed at work for which he is suited, and his work supervised by the plant physician.

That each compensation commission has its own method of estimating eye injuries and no two of these methods are similar, resulting in conflicting standards among the states is pointed out by Dr. J. A. Jackson, New York Edison Co. This often has the effect of leaving employer and employee in doubt as to whether they have received proper recognition for their claims. A standard method of testing eyes is advocated.

Back injuries from the compensation standpoint, and the difficulty of determining not only the cause, but the exact type of the injury, is taken up by Dr. F. E. Schubmehl, General Electric Co.

That the introduction of the physician into the industrial organization has produced many beneficial results is the conclusion reached in the report, it being pointed out that the physician's work has revealed to the employer many sources of economic waste and to the worker the unnecessary price he is paying for inattention to his health.

A 20-ton open-hearth furnace is to be erected by the S. R. Smythe Co., Oliver Building, Pittsburgh, for the Universal Steel Co., Bridgeville, Pa., on foundations built by Universal company. The furnace is of the Smythe design with no unusual features.

NEW PERSONNEL ASSOCIATION

Engineers and Managers Organize to Study Industrial and Labor Questions

To study the human factor in American business and industrial life, to solve the problems which confront the management of industrial enterprises, and to bring about a better understanding of the labor question, leaders of organized engineering, representatives of large industries, insurance companies, railroads and publishers, and members of university faculties have organized the National Personnel Association.

The new organization takes over the activities of the National Association of Corporation Training and the Industrial Relations Association of America. Co-operative research will be conducted on a nationwide scale, and close relations will be established with colleges and universities in carrying out an extensive educational program.

An executive committee and a board of directors have been chosen. Members of the committee include Sam A. Lewisohn, Miami Copper Co., New York; John McLeod, Carnegie Steel Co., Pittsburgh; J. M. Larkin, Bethlehem Steel Co., Bethlehem; W. H. Winans, Union Carbide & Carbon Corporation, New York; J. W. Dietz, Western Electric Co., New York; Francis Farwell, Worthington Pump & Machinery Corporation, New York; S. R. Rectanus, American Rolling Mill Co., Middletown, Ohio, and Arthur H. Young, International Harvester Co., Chicago.

L. W. Wallace, executive secretary of the Federated American Engineering Societies, and L. P. Alford, New York, vice-president of the American Society of Mechanical Engineers, are among the directors elected. Among the several other directors are Alvin E. Dodd, United States Chamber of Commerce, Washington; C. V. Derrick, American Bosch Magneto Co., Springfield, Mass.; F. H. Dodge, Burroughs Adding Machine Co., Detroit; Dr. E. M. Hopkins, Dartmouth College, Hanover, N. H.; A. H. Lichty, Colorado Fuel & Iron Co., Denver; E. S. McClelland, Westinghouse Electric & Mfg. Co., East Pittsburgh; Louis L. Park, American Locomotive Co., Schenectady; F. W. Thomas, Atchison, Topeka & Santa Fe Railroad, Topeka.

W. W. Kincaid, Niagara Falls, head of the Spirella Co., has been named president of the new organization. Earl B. Morgan, Curtis Publishing Co., Philadelphia, is vice-president, and Montague A. Clark, the E. I. DuPont de Nemours & Co., Arlington, N. J., is treasurer. W. J. Ronald, 20 Vesey Street, New York, is the managing director and secretary. C. S. Coler, educational director, Westinghouse Electric & Mfg. Co., has been appointed chairman of the committee on industrial and public school relations.

To Help Associations Conduct Statistical Bureaus

WASHINGTON, Aug. 12.—A wider collection and use of essential business statistics is urged on business organizations by the fabricated production department of the Chamber of Commerce of the United States. It is preparing to set up a service for chambers of commerce and trade associations for the purpose of informing them how statistical bureaus may be established and operated.

New England Foundrymen Outing

The New England Foundrymen's Association held its annual August outing Wednesday, Aug. 9, at The Hummocks, Hamilton, R. I. It was the largest attended and most successful outing of its kind ever held. Approximately 170 enjoyed the clambake. Providence members of the association had charge of the affair. Edward F. Parks, Universal Winding Co., was chairman of the committee of arrangements; A. J. Miller, Whitehead Brothers Co. and C. H. Colvin, Colvin Foundry Co., were in charge of indoor and outdoor sports and entertainment; and W. Scott Thomas, J. W. Paxson Co., of transportation. These gentlemen and the following constituted the general committee: W. G. Rich, Providence Gas Co.; J. W. Richardson, H. & B. American Machine Co.; William S. White, J. S. White Co.; Henry S. Chafee, Builders' Iron Foundry; Harry C. Johnson, General Fire Extinguisher Co.; R. C. Fuller, Fuller Iron Works; W. M. Saunders, Saunders & Franklin; C. D. Starr, Barstow Stove Co.; George R. Burt, Franklin Machine Co.; John E. Aldrich, New England Butt Co.; L. M. Sherwin, Brown & Sharpe Mfg. Co.; and Charles E. Andrews, Whitehead Brothers Co. No association business was transacted at the outing.

Farm Implement Makers to Meet

The National Association of Farm Equipment Manufacturers, formerly known as the National Implement and Vehicle Association, will hold its annual convention at the Congress Hotel, Chicago, on Oct. 18, 19 and 20. Arrangements for the program have not been completed, but tentative acceptances have been received from at least one cabinet member, from the president of one of the best known railroads, from a prominent authority on agriculture and from a leader in agricultural finance. In addition to speakers from outside the association, the following are among the subjects which will be discussed by members: "Present and Future of the Implement Industry," "Transportation Situation from the Shippers' Viewpoint," "The National Institute of Progressive Farming," "Depreciation."

Trade Association Executives to Meet

The American Trade Association Executives will hold its third annual meeting at the Inn, Buck Falls, Pa., which is near the Delaware Water Gap, Oct. 25, 26 and 27. In view of the considerable talk there has been about trade associations, this meeting is expected to be of a particular interest to those in trade association work. The railroad station is at Cresco, on the Delaware, Lackawanna & Western Railroad.

The Commercial Steel Sales Co. has been organized in Philadelphia and has taken offices in the Stock Exchange Building, that city. It will represent in a sales capacity several companies making finished and semi-finished iron and steel. S. J. Carroll, formerly vice-president of the Pennsylvania Steel Export Co.; H. S. Gilhams, formerly of H. S. Gilhams Co., and J. S. Kenyon, formerly general manager of the Duplex Metallic Co., all of Philadelphia, are the officers and directors of the new organization.

COMING MEETINGS

August

Lake Superior Mining Institute. Aug. 28 to 30, inclusive. Annual meeting, Houghton, Mich. Secretary, A. J. Yungbluth, Ishpeming, Mich.

National Safety Council. Aug. 28 to Sept. 1. Annual meeting, Cass Technical High School, Detroit. Secretary, W. H. Cameron, 166 North Michigan Avenue, Chicago.

September

American Engineering Council. Sept. 8 and 9. Executive board meeting, Boston. Report on three-shift day in industry. Secretary, L. W. Wallace, 719 Fifteenth Street, N. W., Washington.

Association of Iron and Steel Electrical Engineers. Sept. 11 to 15, inclusive. Annual convention, New Auditorium, Cleveland. Secretary, J. F. Kelly, 513 Empire Building, Pittsburgh.

National Exhibition of Chemical Industries. Sept. 11 to 16. Grand Central Palace, New York.

American Electrochemical Society. Sept. 21, 22 and 23. Fall meeting, Windsor Hotel, Montreal, Canada. Secretary, Dr. Colin G. Fink, Columbia University, New York.

American Institute of Mining and Metallurgical Engineers. Sept. 25 to 29. Pacific Coast meeting, Engineers' Club, San Francisco. Secretary, F. F. Sharpless, 29 West Thirty-ninth Street, New York.

STRICT PRICE CONTROL

Secretary Hoover Favors Legislation—Position of the President Not Known

WASHINGTON, Aug. 15.—Congress will be asked within a short time to enact legislation providing for the strict control of prices and distribution of coal and probably within 48 hours will be addressed by President Harding regarding the railroad situation.

These were the two outstanding features of the coal and railroad strikes which developed in Washington to-day. It is evident that the administration realizes that a critical condition is faced by the country and that it must be met at once if much more serious crippling of transportation and industry and suffering of the public are to be avoided. The railroad situation is declared to be growing worse and efforts to solve it by negotiations are deadlocked. It is the purpose of the President to present the complete railroad situation to Congress and the country, but as yet it is not known by him what suggestions he may make.

Secretary Hoover's Position

While the President is represented as believing the coal problem is not far from a solution, it was stated this morning by Secretary Hoover that regardless of how soon extensive coal mining operations are resumed, it will be necessary to get prompt legislation enacted for strict control of prices and distribution of coal. This is especially necessary, he pointed out, as it relates to lake cargo and anthracite coal, but the plan which is proposed, it is taken for granted, will apply to all coal for industrial and other uses.

It was stated that continued control of prices and distribution of coal now under a more or less stringent voluntary system cannot prevail indefinitely and it has been taken as a foregone conclusion that coal distribution under Government supervision will be necessary for a period, no matter how soon the strike comes to an end. The point has been made that although the Interstate Commerce Commission can allot cars and establish priority; it has nothing to do with actual distribution and prices as such, but deals only with transportation. The statement was made that while some non-union operators are adhering to their agreement with Secretary Hoover as to prices, others have been and are breaking away from it and asking much higher levels. It is assumed that if Congress provides the legislation, the authority given by it will be exercised through the President's Fuel Administration Committee.

Inconsistent With Priorities Plan

The Interstate Commerce Commission to-day issued a statement pointing out that application of the so-called "railroad assigned car rule" is inconsistent with the plan of priorities carried in car service order No. 23 and ordered that it should not be invoked by the railroad carriers subject to the priority rule. The effect of this is to require carriers to get coal through the Federal Fuel Distibution Committee rather than to resort to the customary plan of assigning cars to mines and taking coal under the "assigned cars rule."

FABRICATED STEEL BUSINESS

Bridge and Building Awards and Tonnages Pending at Leading Centers

Awards for fabricated steel work for the past week include the following:

Building at Perth Amboy, N. J., 250 tons, to Schrimpf Iron Works.

St. Paul Street bridge, Baltimore, 400 tons, to Chesapeake Iron Works.

Hunters' Point telephone exchange for New York Telephone Co., 1000 tons, to Eidlitz & Ross.

Garage on East Seventy-sixth Street, New York, 900 tons, to George A. Just Co.

Public School No. 139, New York, 800 tons, to A. E. Norton, Inc.

New armory, New York, 1300 tons, Post & McCord, low bidder.

Masonic Temple, Paterson, N. J., 500 tons, to Paterson Bridge Co.

Yarn building, Newburgh, N. Y., 100 tons, to American Bridge Co.

Apartment building, 2450 Lake View Avenue, Chicago, 688 tons, to American Bridge Co.

Standard Oil Co., 46 additional oil tanks of 80,000-bbl. capacity, Casper, Wyo., 14,000 tons, 29 tanks to Chicago Bridge & Iron Works and 17 to American Bridge Co.

Five additional stories Carter Building, Houston, Tex., 306 tons, to Houston Structural Steel Co.

High school building, Rock Rapids, Iowa, 109 tons, to unnamed fabricator.

Nevada Consolidated Copper Co., building, Salt Lake City, Utah, 2000 tons, to Kansas City Structural Steel Co.

Additional steel for Kansas City Athletic Club building, Kansas City, Mo., 200 tons, to Kansas City Structural Steel Co.

Addition to plant of Lima Locomotive Works, Lima, Ohio, 1700 tons, to Massillon Bridge Co.

Witherbee, Sherman & Co., Port Henry, N. Y., 500 tons, to the Lackawanna Bridge Works Corporation.

Addition for power plant for L. E. Myers Co., Tony, Wis., 100 tons, to Worden-Allen Co.

Baseball park grand stand, Detroit, 500 tons, to The Russell Wheel & Foundry Co.

Structural Projects Pending

Inquiries for fabricated steel work which may be added to lists of pending projects include the following:

The New York Central Railroad, subway structure at Elyria, Ohio, tonnage not mentioned in inquiry; bids close Aug. 21.

Chesapeake & Ohio Railroad, bridge, 100 tons.

Building for General Electric Co., Schenectady, N. Y., 200 tons.

Building for Transit Commission at Lenox Avenue yards, New York, 125 tons.

Bascule bridge, Burnsham, Ill., 700 tons.

Louisiana & Arkansas Railroad, locomotive repair shop, 1311 tons.

Freight terminal for Illinois Central and Lake Erie & Western railroads at Indianapolis, tonnage unstated, plans completed but action deferred temporarily.

School building, Cincinnati, 400 tons.

Medical Center Building, Cleveland, 500 tons, bids taken.

St. Joseph's Home, Erie, Pa., 590 tons, bids taken.

Bolton Square apartment house, Cleveland, 700 tons.

Pennsylvania-Detroit freight house, Detroit, 1500 tons, bids taken.

Ingram Richardson Co., Bayonne, N. J., factory building, 300 tons, bids taken.

Steel plant, Otis Steel Co., Cleveland, 9000 tons.

Railroad Equipment Business

Although the formal inquiries have not been issued, it is known that three large railroads centering at Chicago will be in the market shortly for a total of 6500 new freight cars, and car builders are receiving many small contracts for car repairs pending a settlement of the rail strike.

The Burlington is expected to issue an inquiry this week for 2000 gondola cars.

The Illinois Central is inquiring for 75 caboose cars.

The Elgin, Joliet & Eastern has awarded 80 steel underframes to the General American Car Co.

The Indiana Coke & Gas Co., Terre Haute, Ind., has let repairs on 50 hopper cars to the American Car & Foundry Co.

The Chicago & North Western has issued an inquiry for 40 Mikado type and 10 Pacific type locomotives.

The Missouri, Kansas & Texas is inquiring for 40 Mikado type engines and 10 eight-wheel switchers.

The New York, Chicago & St. Louis has placed 15 additional locomotives with the Lima Locomotive Co.

The Seaboard Air Line has placed 600 freight car repairs with the Magor Car Co. in addition to the 400 reported placed with that company recently and it has awarded several hundred freight car repairs to the Richmond Car Works.

Orders received by the American Locomotive Co. include the following: Detroit Terminal Railroad Co., 2 switching engines; Public Service Co. of Northern Illinois, 1 switching engine; E. S. Tubarao A Ararangua (Brazil), 1 Mikado type engine; Wheeling Steel & Iron Co., 1 switching engine.

The Pacific Electric Co. is inquiring for 200 gondola cars.

Iron and Steel Markets

A SCARCITY MARKET

Prices Go Higher With Further Fall in Production

Operations on a 50 to 60 Per Cent Basis — Advances in Wire, Sheets and Pipe

The steel industry has suffered fresh losses in output in the past week, and there are indications that further crippling of blast furnaces and steel works will come before there is a turn for the better. More price advances and other aspects of a scarcity market have developed.

From a 65 to 70 per cent steel output last week the Steel Corporation is now down to about 60 per cent, and independent companies probably are not above 50 per cent on the average.

As in other weeks, blast furnaces are more seriously affected than steel works, and at least 13 furnaces have stopped in the second week of August—four in the Pittsburgh district, four at outside points in western Pennsylvania, three in eastern districts, one at Cleveland and one at Milwaukee.

Whatever the mining resumptions arranged at Cleveland may amount to, the steel industry is counting on little or no help from this source for weeks. Not only has the railroad strike caused the recent throttling of pig iron and steel production, but it is certain that when that strike ends the increased car and fuel supply will be turned into other than iron and steel channels.

Market changes of the week reflect the general belief of producers that for most if not all of the remainder of the year a rationing of steel supply will be the order. At Pittsburgh the mill schedules of the Carnegie Steel Co. have gone to a priority basis in which the order of preference is food containers, agricultural works, the oil industry and railroad car works.

Among important price developments is the opening of books of the American Sheet & Tin Plate Co. for fourth quarter business in sheets at 2.50c. base for blue annealed, 3.35c. for black and 4.35c. for galvanized—an advance of $2 per ton for the first named and $4 for black and galvanized.

An independent wire company has gone to $2.60 per keg for nails and to $2.35 for plain wire, or $4 and $2 respectively above Steel Corporation prices.

Several independent makers of standard pipe have advanced prices $6 per ton on black and $4 per ton on galvanized. The Steel Corporation and one independent are still on the old basis. Inquiry for line pipe includes 100 miles of 8, 10 and 12-in. and several thousand tons of 12-in. and 16-in.

Apart from the Steel Corporation nearly all producers of plates, shapes and bars have advanced those products, 2c. now being common for early delivery, with a range up to 2.25c. on urgent business.

Prices recently ruling on semi-finished steel now apply to such shipments as are being made on contracts. The small sales current are at $2 to $2.50 above the $35 level on billets and sheet bars and the $40 level on forging billets and wire rods.

In view of the tight mill situation, it is not surprising that warehouse prices have gone up in response to the piecing-out demand that is coming from all directions.

Buying of railroad cars still largely gives place to contracting for car repairs, but three Western roads are expected shortly to cover for 6500 new cars. Inquiries for 100 locomotives have appeared, and orders for 20 locomotives have been placed.

The sustained activity in fabricated steel work is shown in the figures for the last three weeks. Some 45,500 tons in 62 jobs, not including large oil tank business, were put under contract as compared with 46,700 tons for 61 jobs for the corresponding weeks a month ago.

The Standard Oil Co. has ordered 46 oil storage tanks in addition to the 33 reported last week, and about 31,000 tons of steel will be required for all the tank work just placed.

In the further advance of pig iron prices, due to inadequate supply of coke, foundry grades have taken the lead and in nearly all important centers have been marked up from $1 to $3 per ton. Basic and Bessemer have remained nearly stationary and a few transactions have been recorded at $1 below recent quotations. Important sales of the week include 7000 tons of foundry iron to the Pennsylvania Railroad, 4000 tons of copper-free low phosphorus to a wire company and 6000 tons of copper-bearing low phosphorus. Importers have contracted for large tonnages of foreign pig iron, in view of the increasing scarcity at home, but consumers in this country are disposed to be conservative about import orders.

The movement of iron ore shows improvement. The Great Northern, perhaps the most seriously affected by the rail strike, is now carrying about 90 per cent of the normal amount. Stocks of ore on Lake Erie docks increased 2,341,968 tons in July and on Aug. 1 stood at 7,396,842 tons.

Pittsburgh

Four More Blast Furnaces Added to Idle List —Prices Advancing

PITTSBURGH, Aug. 15.—The coal and railroad strikes still are exacting heavy tribute from the iron and steel industry, and as manufacturing activities dwindle and supplies become more limited, prices grow stronger. At the moment the coal strike situation is overshadowed by the railroad strike, which in several parts of the country is spreading to the train crews. The Pennsylvania and the Pittsburgh & Lake Erie railroads still are functioning in nearly normal shape, but west and south the railroads are suffering by the refusal of operating men to work on locomotives or cars on the pretext that they are in bad order. The present low rate of iron and steel plant activities is charged chiefly to the inability of Southern railroads to move coal, and the claim is made that enough coal could be had from

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Aug. 15, 1922	Aug. 8, 1922	July 18, 1922	Aug. 16, 1921
No. 2X, Philadelphia‡	**$33.14**	$31.14	$27.64	$20.34
No. 2, Valley furnace†	**30.00**	29.00	24.00	19.50
No. 2, Southern, Cin'ti	24.05	24.05	21.53	23.50
No. 2, Birmingham, Ala.†	19.50	19.50	18.00	19.00
No. 2 foundry, Chicago*	**30.00**	27.00	24.00	20.00
Basic, del'd, eastern Pa.	27.25	27.25	25.75	19.00
Basic, Valley furnace	26.00	26.00	24.00	18.00
Valley Bess, del. Pitts	28.76	28.76	26.77	21.96
Malleable, Chicago*	**30.00**	27.00	24.00	20.00
Malleable, Valley	28.00	28.00	24.50	20.00
Gray forge, Pittsburgh	**30.00**	28.76	25.27	21.46
L. S. charcoal, Chicago	33.15	33.15	31.65	33.50
Ferromanganese, seab'd	67.50	67.50	67.50	70.00

Rails, Billets, Etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$40.00	$40.00	$40.00	$47.00
Bess. billets, Pittsburgh	35.00	35.00	35.00	30.00
O.-h. billets, Pittsburgh	35.00	35.00	35.00	30.00
O.-h. sheet bars, P'gh	35.00	35.00	35.00	32.00
Forging billets, base, P'gh	40.00	40.00	40.00	35.00
O.-h. billets, Phila	42.67	42.67	40.17	35.74
Wire rods, Pittsburgh	**42.00**	40.00	40.00	42.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	**2.00**	1.80	1.70	1.75
Light rails at mill	**1.90**	1.75	1.75	1.85

Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	**2.325**	2.025	1.925	2.05
Iron bars, Chicago	**2.15**	2.00	1.90	1.75
Steel bars, Pittsburgh	**1.90**	1.80	1.70	1.75
Steel bars, Chicago	1.90	1.90	1.75	2.13
Steel bars, New York	**2.24**	2.14	2.04	2.13
Tank plates, Pittsburgh	**1.90**	1.80	1.70	1.80
Tank plates, Chicago	1.90	1.90	1.75	2.18
Tank plates, New York	**2.34**	2.14	2.04	2.18
Beams, Pittsburgh	**1.90**	1.80	1.70	1.85
Beams, Chicago	1.90	1.90	1.75	2.23
Beams, New York	**2.24**	2.14	2.04	2.23
Steel hoops, Pittsburgh	2.50	2.50	2.50	2.25

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.
The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Sheets, Nails and Wire,	Aug. 15, 1922	Aug. 8, 1922	July 18, 1922	Aug. 16, 1921
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	3.15	3.15	3.15	3.00
Sheets, galv., No. 28, P'gh	4.15	4.15	4.15	4.00
Sheets, blue an'l'd, 9 & 10	2.40	2.40	2.40	2.25
Wire nails, Pittsburgh	2.40	2.40	2.40	2.75
Plain wire, Pittsburgh	2.25	2.25	2.25	2.50
Barbed wire, galv., P'gh	3.05	3.05	3.05	3.40
Tin plate, 100-lb. box, P'gh	$4.75	$4.75	$4.75	$5.25

Old Material, Per Gross Ton:				
Carwheels, Chicago	**$20.50**	$19.50	$19.50	$13.00
Carwheels, Philadelphia	17.50	17.50	17.50	16.00
Heavy steel scrap, P'gh	17.50	17.50	17.25	13.00
Heavy steel scrap, Phila.	15.00	15.00	15.00	11.50
Heavy steel scrap, Ch'go	**15.75**	15.50	15.50	10.75
No. 1 cast, Pittsburgh	19.00	19.00	19.00	16.00
No. 1 cast, Philadelphia	**19.00**	18.00	17.50	17.00
No. 1 cast, Ch'go (net ton)	**18.50**	18.00	17.00	13.00
No. 1 RR. wrot, Phila.	**18.00**	17.50	17.00	14.00
No. 1 RR. wrot, Ch'go (net)	**14.50**	14.25	13.50	11.00

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$14.00	$14.00	$11.00	$2.75
Foundry coke, prompt	15.00	15.00	11.00	3.75

Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	14.12½	14.12½	14.00	12.00
Electrolytic copper, refinery	13.75	13.75	13.75	11.75
Zinc, St. Louis	*6.15*	6.30	5.75	4.20
Zinc, New York	*6.50*	6.65	6.10	4.70
Lead, St. Louis	**5.55**	5.50	5.50	4.25
Lead, New York	**5.90**	5.85	5.75	4.40
Tin (Straits), New York	*32.12½*	32.62½	31.50	26.12½
Antimony (Asiatic), N. Y.	5.25	5.25	5.00	4.50

Composite Price, Aug. 15, 1922, Finished Steel, 2.255c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel

Aug. 8, 1922,	2.212c.
July 18, 1922,	2.169c.
Aug. 16, 1921.	2.364c.
10-year pre-war average.	1.689c.

Composite Price, Aug. 15, 1922, Pig Iron, $26.77 Per Gross Ton

Based on average basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

Aug. 8, 1922,	$25.94
July 18, 1922,	23.61
Aug. 16, 1921.	18.89
10-year pre-war average,	15.72

the South to maintain a fairly high rate of steel works operations if the railroads could transport it.

There has been a further net loss of four blast furnaces in this district in the past week. The Jones & Laughlin Steel Co. has banked one furnace each of its Eliza and Aliquippa group, now having only three of 12 furnaces making iron. The Crucible Steel Co. and the Sharon Steel Hoop Co. each has blown out a furnace since a week ago. The Carnegie Steel Co. has put down the one active stack at its Farrell, Pa., works, but has turned on the blast at one of its Clairton, Pa., furnaces and still is operating 35 furnaces out of a total of 59. Steel works operations also are suffering. It is doubtful whether ingot production of the independent companies in this and nearby districts now exceeds 50 per cent of capacity, while the Carnegie Steel Co., which last week produced somewhat in excess of 70 per cent of capacity, is not expected to do much in excess of 60 per cent this week. This company is conserving its coal primarily for coke, and is maintaining operations of steel melting units having access to natural gas or fuel oil. The past week has developed a number of important changes marketwise.

The Carnegie Steel Co. has adopted a plan of scheduling its mills on a priority basis, whereby preference is given first to material for food containers, second for the requirements of the agricultural industry, third for the oil industry, in helping oil production for fuel, fourth steel for railroad cars and fifth for the requirements for roadwork and other public utilities. Although other companies are not adopting such a plan, it is equally difficult for buyers to obtain supplies other than of such lots as the mills have in stock or are reasonably certain of being able to produce.

A large independent producer of wire goods yesterday announced an advance of $4 per ton in plain and cement coated nails and of $2 in plain wire. Other manufacturers have not acted, but most of them have been largely out of the market for the past few weeks. Most independent makers to-day advanced prices of standard pipe $4 per ton on galvanized and $6 per ton on black. The American Sheet & Tin Plate Co. has notified its customers that prices of sheets for the last quarter of the year will be 2.50c. base for blue annealed, 3.35c. for black and 4.35c. base for galvanized. Electrical sheets are left at the present base.

The market is definitely stronger for plates, shapes and bars and on spot tonnages 2c. Pittsburgh is pretty common, and even has been exceeded on some urgent business. Higher prices seem immediately ahead for

semi-finished steel in view of the curtailment of production, not to mention the increasing cost of pig iron. Scrap prices hold strong in the face of a very light demand and supplies of fuel are still too limited to permit of any easing in prices.

Pig Iron.—The market continues to gain in strength, especially on foundry grades, due to the ability of consumers of these grades to maintain higher relative operations than the users of steel making iron. A sanitary ware manufacturer recently closed for 1500 tons of No. 2 and No. 2 X iron for early delivery, on a base of $29.50 Valley furnace for the base grade. No more of this grade seems to be available at that price, and on small tonnages $30 has been paid, and the demand from the foundries is so insistent that it is believed iron could be sold here out of Buffalo, where the price is $31, and the delivered price here would be slightly more than $34.25. Some fairly sizable sales of steel making grades, made prior to last reports, have come to light. One of these sales involves 5000 tons of basic at $25, Valley furnace, to a Pittsburgh district consumer, and another 2000 tons of Bessemer at $26, Valley furnace, for shipment to Wheeling. These prices are about $1 per ton below what now could be done, as producers are holding at $26, Valley furnace, for basic and $27 for Bessemer, and some small sales have been done at these prices. Sales of off basic iron are noted at $23 and $24, but stocks of such iron no longer are large. The Follansbee Brothers Co. is inquiring for 5000 tons of basic for September shipment. We note one sale of 200 tons of No. 3, or gray forge iron, at $30, delivered Pittsburgh, but it is believed that $30 furnace now could be done on this grade.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$26.00
Bessemer	27.00
Gray forge	28.25
No. 2 foundry	30.00
No. 3 foundry	28.25
Malleable	28.00

Ferroalloys.—The market in ferromanganese is a very limited one at present, due to the fact that with the decreasing steel works operations consumption is diminishing and consumers are too well covered to be actively interested in the market. Domestic producers at the moment are not actively seeking business because present indications are that the tariff will be in effect by Oct. 1, and they want to be free to act when this becomes a reality. Much of the current business is in less than carload lots at around $85 per ton, although one producer has announced a price of $100 at seaboard on such tonnages. It is claimed that carload lot sales have been made at more than $75 for prompt shipment. British material still is quotable as low as $67.50 c.i.f. Atlantic seaboard, for deferred delivery, but this price does not mean much in view of the fact that the tariff may be in effect by the time delivery can be made and the proposed duties added to this price would mean a cost to consumers of $100 per ton at seaboard. German material for delivery in six to eight weeks is priced at $67.50 to $70 seaboard. Demand for spiegeleisen, although relatively small, exceeds the available supply, and higher prices are looked for. In addition to an inquiry for 400 tons from a nearby consumer, an Ohio steel maker has inquired for 1000 tons for last quarter shipment.

We quote 78 to 82 per cent ferromanganese, $75 c.i.f. Atlantic seaboard for domestic; British, spot, $72.50; British, future, $67.50; German, 76 to 80 per cent, $67.50 to $70. Average 20 per cent spiegeleisen, $36 furnace; 16 to 19 per cent, $35 furnace; 50 per cent ferrosilicon, domestic, $55 to $60 furnace, freight allowed. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, $41.50; 11 per cent, $44.80; 12 per cent, $48.10; 13 per cent, $52.10; 14 per cent, $55.10; silvery iron, 6 per cent, $30; 7 per cent, $31; 8 per cent, $32.50; 9 per cent, $34.50; 10 per cent, $36.50; 11 per cent, $39; 12 per cent, $40.50. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $4.06 per gross ton.

Billets, Sheet Bars and Slabs.—Semi-finished steel is so scarce that few makers are in a position to entertain inquiries even for small tonnages that the price of $35 Pittsburgh or Youngstown, for sheet bars, slabs and large billets, now refers entirely to such shipments as are being made on contracts. Although demand is far from active, it considerably exceeds the available supply and those who must have tonnages in a hurry are finding it difficult to obtain accommodation, except at an advance of $2.50 to $3 per ton. Small sales of sheet bars are reported at $37.50 and it is doubtful whether slabs or large billets could be had today at less than that price. Labor shortages, as well as the scarcity of fuel, are affecting production. On forging billets $40 is merely the price on contract shipments and on new business for early delivery the market is quotable from $43 to $45.

We quote 4 x 4-in. soft Bessemer and open-hearth billets at $35 to $37.50; 2 x 2-in. billets, $35 to $37.50; Bessemer and open-hearth sheet bars, $35 to $37.50; slabs, $35 to $37.50; forging billets, ordinary carbons, $40 to $45, all f.o.b. Youngstown or Pittsburgh mills.

Wire Rods.—As a basis of sales, $40, base, for common soft rods appears to have disappeared. The leading interest is practically out of the market and those independents who might take on some tonnage hardly would do so at less than $43 while $45 is the price idea of one important maker. Actual business is kept down by the lack of supplies more than by a lack of demand.

We quote No. 5 common basic or Bessemer rods to domestic consumers, $43 to $45; chain rods, $43 to $45; screw stock rods, $48 to $50; rivet and bolt rods and other rods of that character, $43 to $45; high carbon rods, $50 to $55, depending on carbon, per gross ton, f.o.b. Pittsburgh or Youngstown.

Iron and Steel Bars.—Prices of steel bars are growing stronger in response to the curtailment of steel production and the inability of manufacturers to catch up with their obligations. Only attractive tonnages, and these for indefinite delivery, now can be placed as low as 1.80c., and several makers who are able to sell only such supplies as they have in stock are not interested at less than 2c. Reinforcing bars are held just as firmly as mild bars. There is no change in iron bars.

We quote steel bars rolled from billets at 1.80c. to 2c.; reinforcing bars, rolled from billets, 1.80c. to 2c. base; rail steel reinforcing bars, 1.70c. to 1.80c.; refined iron bars, 2.25c. in carloads, f.o.b. mill, Pittsburgh.

Structural Material.—The question of deliveries is becoming more perplexing because the mills are finding it difficult to maintain production in the face of decreasing supplies of steel. The full range of prices is from 1.80c. to 2c. Pittsburgh, but the lower figure refers to definite tonnages of good-sized proportions and the Steel Corporation seems to be alone at that figure. Generally the independents are on a minimum of 2c., and it is reported that as high as 3c. recently was quoted on a lot of 200 tons of small channels. Fabricators are interested in a new building for the Hardy Candy Co., Pittsburgh, for which 2100 tons of steel will be required and other live projects are the fastenings for the five 100-ton open-hearth furnaces for the Wisconsin Steel Co., South Chicago, and steel for the filtration plant for Wheeling, W. Va. Plain material prices are given on page 449.

Plates.—The chief source of demand now is in connection with oil storage tanks, for which there is a very brisk demand, particularly from the Southwest, due to the fact that producers are inclined to store rather than to sell oil at current prices. The Steel Corporation price now is 1.80c. base, Pittsburgh, but independents are holding at 2c. minimum and some are asking and obtaining as high as 2.25c. on small tonnages for quick delivery. Prices are given on page 449.

Sheets.—The American Sheet & Tin Plate Co. prices for fourth quarter will be 2.50c. base on blue annealed, 3.35c. base on black and 4.35c. base on galvanized. There has been no formal opening of books for this period by the company and these prices, representing advances of $2 per ton on blue annealed and of $4 per ton in black and galvanized sheets, merely have been announced to the company's customers. It is estimated that current costs are at least $6 per ton higher now than they were in the second quarter and since present indications are that fuel and labor costs will be higher over the remainder of the year, losses could not be avoided if present prices were made for that period, but all are expected to follow the Steel Corporation. It is probable that makers generally will be unable to take on much fourth quarter business because the carry over from the present quarter promises to be large. Present prices are given on page 449.

Iron and Steel Pipe.—Effective today the Youngstown Sheet & Tube Co. has reduced discounts on stand-

ard pipe three points on black and two points on galvanized, equivalent to an advance of $6 a ton on the former and of $4 on the latter. Most of the other independent makers have made this advance, but as yet the Republic Iron & Steel Co. and the National Tube Co. have not acted. Oil country and line pipe quotations have been withdrawn by all companies except these two, and prices now are made only upon application. This advance is not altogether unexpected because costs have been rising steadily for some time, and it is stated that for several weeks business has been done for no profit or at a slight loss. Most producers are heavily committed on the butt weld sizes and on account of the difficulty in maintaining steel production a number of companies have found it necessary to resort to an apportioning of production. Orders in lap welded goods are relatively light, but the inquiry lately has been gaining. About four miles of various sizes of pipe are wanted for the new filtration plant for the City of Wheeling, W. Va., while the Phillips Petroleum Co. is in the market for 100 miles of 8-in., 10-in., or 12-in. pipe and several thousand tons of 12-in. and 16-in. light weight pipe is wanted by a coal producer with operation in West Virginia and Kentucky. The Foundation Co., which has the contract for the Empire Building additions and extension, is inquiring for about 800 tons of 12-in. plain end pipe, with ⅜-in. wall for foundations. Makers of wrought iron pipe are pretty well sold ahead on the merchant sizes. Discounts are given on page 449.

Warehouse Business.—Effective immediately, the Carnegie Steel Co. and Jones & Laughlin Steel Co. have advanced warehouse prices of hot-rolled steel products $2 per ton. The new quotations are 2.45c. for bars, 2.55c. for plates and shapes and 3.10c. for bands and 3.95c. for hoops.

Tin Plate.—Pressure for shipments on contracts does not appear to be so urgent as it was recently and the shortage of steel is not so much of a factor as it is in most other products. Some of the independent companies making a full line of steel products have suspended operations of some mills and diverted the steel to other uses. The American Sheet & Tin Plate Co., on the other hand, has increased its active tin plate capacity, due to the fact that it has been able to get Bessemer steel. Few makers have very extensive obligations extending beyond Oct. 1 and all probably will be able to meet the bulk of them. There is no change in prices, the official quotation being $4.75 per base box, Pittsburgh, with the usual concessions from this figure to the large and preferential consumers.

Wire Products.—Effective immediately, the Pittsburgh Steel Co. has advanced the price of nails to 2.60c. base per keg, Pittsburgh, cement coated nails to 2.10c. base per count keg, and wire to 2.35c. base per 100-lb. These prices represent an advance of $4 per ton in nails, and $2 per ton in wire, which carries a corresponding increase in galvanized and barbed wire and in staples. The American Steel & Wire Co. has not changed its prices, but this company, as well as most of the independents, practically is out of the market and now, as for the past few weeks, is merely taking on such business as can be supplied from stock or have a supply of steel sufficient to insure full performance of obligations. Those companies making sales of nails out of stock have been charging $2.50 base per keg, Pittsburgh. The Pittsburgh Steel Co. appears to be faring better than most other companies in the matter of maintaining operations, but with labor so scarce and fuel costly, the company claims to have been losing money at recent prices. Quotations are given on page 449.

Steel Rails.—The Carnegie Steel Co. has raised its price on light rails from 1.75c. base to 1.90c. Independent makers of these rails, rolling them from new steel, are quoting 2c. base. Business is not very brisk and sales usually are in small lots, but the shortage of steel is beginning to tell on the available supplies.

We quote 25 to 45-lb. sections, rolled from new steel, 1.90c. to 2c. base; rolled from old rails, 1.75c. to 1.80c. base; standard rails, $40 per gross ton mill for Bessemer and open-hearth sections.

Coke and Coal.—Available supplies still are extremely limited and the market is entirely a sellers' affair. Coal still commands from $7 to $8 per ton at mines, and the limited tonnages of beehive oven coke reaching the market are moving at from $14 to $15 per net ton at ovens for furnace grade and from $15 to $16 for that going to the foundries. The quality of current offerings of coke is very poor and it is claimed by some of the steel companies that from 2500 to 2900 lb. of present day coke are required for a ton of high iron. Good practice on basic iron is from 1800 to 2000 lb.

Cold-Finished Steel Bars and Shafting.—This line is firm in price, but the explanation is to be found in the strong market in hot-rolled bars rather than in the demand, which already is beginning to reflect the enforced curtailment of automobile production, due to the inability of that industry to get as large supplies of other kinds of steel as are required. All makers of rolled, drawn and turned bars are quoting 2.25c., base, Pittsburgh, for carloads and 2.50c. for less carloads. Ground shafting is unchanged at 2.65c., base, f.o.b. mill, for carloads and 2.90c. for less carloads.

Hot-Rolled Flats.—There is no easing in the price or supply situation. Mills are committed against probable production for the next 30 days and on account of the steel and fuel supply situation are not anxious for additional business at present prices. On the easily-rolled widths, the market is quotable at 2.50c., base, Pittsburgh, but on narrow stock, 2.75c., base, has become the common price and is sometimes demanded on wide material where prompt delivery is insisted upon.

Old Material.—No good reason exists for materially changing prices. The steel mills are doing very little buying and in the Youngstown district, on account of the contraction in operations forced by the fuel shortage, the mills are holding up shipments on contracts. Because the railroads are not pressing for shipping instructions on material sold, owing to the shortage of coal and the labor troubles, market offerings are quite as small as the demand. The result is a firm market. Railroad or industrial heavy melting steel, is not available at less than $17.50 and one company in this district requiring some good material recently paid $18.50 on 5000 tons. On the other hand, we note sales amounting to 1500 tons of material sold as heavy melting steel at $16.50. The full range on this grade, therefore, would be $16.50 to $18.50, but on a typical specification, the scrap sold at $16.50 would not find acceptance in local mills as heavy melting grade. Compressed sheets are slightly weaker; the highest price recently paid by any of the mills in this district was $16 and while few sellers would accept less, that is about all that can be obtained at the moment. Some users are bidding $15.50, but are not able to obtain tonnages.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows per gross ton:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh	$17.50
No. 1 cast, cupola size	$19.00 to 19.50
Rails for rerolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	17.50 to 18.00
Compressed sheet steel	16.00
Bundled sheets sides and ends	15.00
Railroad knuckles and couplers	19.00 to 19.50
Railroad coil and leaf springs	19.00 to 19.50
Low phosphorus standard bloom and billet ends	21.00 to 22.00
Low phosphorus plates and other grades	19.00 to 20.00
Railroad malleable	16.50 to 17.00
Iron car axles	27.00 to 28.00
Locomotive axles, steel	25.00 to 26.00
Steel car axles	19.00 to 19.50
Cast iron wheels	19.00 to 19.50
Rolled steel wheels	19.00 to 19.50
Machine shop turnings	14.00 to 14.25
Sheet bar crop ends	19.00 to 19.50
Heavy steel axle turnings	15.00 to 15.50
Short shoveling turnings	15.00 to 15.50
Heavy breakable cast	18.00 to 18.50
Stove plate	14.50 to 15.00
Cast iron borings	15.50 to 16.00
No. 1 railroad wrought	15.00 to 15.50

Chicago

Further Curtailment Regarded Certain — Pressing Pig Iron Demand

CHICAGO, Aug. 15.—An immediate resumption of coal mining will not end the difficulties of iron and steel works. So far as they are concerned the damage has been done. Owing to the priorities ruling, it will take so long for them to get additional coal that it is certain that additional blast furnaces will be banked and steel output will suffer further curtailment. Since last writing one additional blast furnace in this district has become inactive, the Bay View merchant stack of the Illinois Steel Co. at Milwaukee having been banked. This is the seventh furnace of this company to be thrown idle in three weeks, six having been banked and one blown out. There are now only 23 active stacks out of a total of 49 in the Chicago, Milwaukee and Duluth districts.

Steel output is also declining. The production of the Illinois Steel Co. has dropped from 78 per cent of ingot capacity to 67 per cent within the past week. The Inland Steel Co. is still on a 65 per cent basis, but it is felt that a reduction to a 30 per cent basis by the middle of September is inevitable. Some of the smaller mills are face to face with the necessity for shutting down altogether. A local bar iron mill has scarcely two weeks' supply of fuel on hand and entertains little hope of securing additional supplies in time to avert suspension of operations. Consumers are also in distress for fuel and this is particularly true of gray iron and malleable foundries.

Demand for prompt foundry coke is very pressing and prices no longer concern the buyer so long as delivery can be secured. Spot inquiries for pig iron are also numerous with the available supply steadily diminishing. Local merchant pig iron has again advanced, this time to $30, base furnace. Among finished products, bar iron and hard steel bars have advanced, while warehouse prices have generally gone up.

Demand for finished steel shows remarkable buoyancy. For a leading local mill new tonnage booked last week was above the average, despite the fact that orders are accepted only for delivery at mills' convenience. These new commitments consist largely of plates, shapes and bars for buildings and storage tanks, although a fair amount of track fastening business was also booked. It is notable, however, that new orders from both railroads and car builders have fallen off, although specifications from the latter are still heavy. On steel for early delivery Pittsburgh base prices rule, as little material is to be obtained from local sources.

Pig Iron.—Local merchant iron has advanced to $30, base furnace. The Bay View stack of the Illinois Steel Co. was banked Monday and further furnace bankings in this district are regarded as inevitable. Demand for spot iron is exceedingly pressing. The situation is acute and is growing steadily worse rather than better, as production in this district declines and shipments from other centers are shut off. Quotations on Southern iron, in fact, have become practically nominal at $20 to $21, base Birmingham, owing to the fact that furnaces find it exceedingly difficult to move shipments beyond the Ohio River. Local producers are finding it necessary to allocate their output among their customers in an effort to tide them over the period, but even in this they are impeded by car shortage, freight blockade and the strike of train service employees on the Elgin, Joliet & Eastern. Among recent transactions may be noted sales of 300 tons of Southern foundry for fourth quarter delivery at $20, base Birmingham, and 300 tons of malleable for immediate shipment. A Michigan automotive plant wants 2000 tons of foundry for early delivery. Another Michigan automotive concern has placed 1000 tons of 9 per cent silvery for August and September shipment at $38, Jackson furnace. A Wisconsin melter has closed for 500 tons of 8 per cent silvery. Jackson County furnaces have withdrawn all prices, but material can still be obtained from electrolytic producers on a basis of $36, f.o.b. Jackson, for 8 per cent. An inquiry for 400 tons of low phosphorus is current, and the quotation on copper free material is about $36, Valley. A local melter has closed for 400 tons of 14 per cent Bessemer ferrosilicon at a reported price of approximately $40, delivered.

Quotations on Northern foundry, high phosphorus malleable and basic irons are f.o.b. local furnace and do not include a switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards, or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$33.15
Northern coke, No. 1, sil. 2.25 to 2.75	31.00
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	30.00
Northern high phos.	30.00
Southern No. 2	$26.00 to 27.00
Malleable, not over 2.25 sil.	30.00
Basic	30.00
Low phos. Valley furnace, sil. 1 to 2 per cent copper free	36.00
Silvery, sil. 8 per cent	40.79

Ferroalloys.—Spiegeleisen is stronger, prices ranging from $47 to $49, delivered. Neither spiegeleisen nor ferromanganese is active.

We quote 78 to 82 per cent ferromanganese, future, $75.06; prompt, $82.56, delivered; 50 per cent ferrosilicon, $57, delivered; spiegeleisen, 18 to 22 per cent, $47 to $49, delivered.

Bars.—Bookings in mild steel bars for indefinite delivery are heavy, while material for early shipment is scarce and is commanding 1.90c. to 2c., base Pittsburgh. With their operations rendered uncertain by the coal strike and with their books well filled, bar iron mills are picking their new orders. Prices have again advanced, the ruling market on bar iron being 2.15c. to 2.25c., Chicago. The minimum price on rail carbon steel bars is now 1.80c., Moline, or 1.955c., Chicago. The two Chicago Heights mills are still tied up by a strike.

Mill prices are: Mild steel bars, 2.15c. to 2.25c., Chicago, for indefinite delivery; common bar iron, 2c., Chicago; rail steel, 1.955c., mill or Chicago.
Jobbers quote 2.70c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.70c. for rounds and 4.20c. for flats, squares and hexagons. Jobbers quote hard and medium deformed steel bars at 2.50c. base; hoops, 3.70c.; bands, 3.45c.

Bolts and Nuts.—As the costs of makers increase, discounts are growing increasingly firm on the July 1 basis and the May 11 prices are now a thing of the past. Discounts on page 449 apply in this territory except that they are f.o.b. Chicago, instead of f.o.b. Pittsburgh.

Jobbers quote structural rivets, 3.35c.; boiler rivets, 3.45c.; machine bolts up to ⅜ x 4 in., 50, 10 and 10 per cent off; larger sizes, 50 and 10 off; carriage bolts up to ⅝ x 6 in., 50 and 5 off; larger sizes, 45 off; hot pressed nuts, squares and hexagons, tapped, $3.25 off; blank nuts, $3.50 off; coach or lag screws, gimlet points, square heads, 60 per cent off; quantity extras are unchanged.

Wire Products.—An Eastern independent has advanced wire nails to $2.60, cement coated nails to $2.10 and plain wire to $2.35. The leading interest, however, has made no change in prices and has given no intimation that advances are contemplated. New business is heavy, but it is suspected that some buyers have been stampeded into placing orders by the two national strikes. For mill prices see finished iron and steel, f.o.b. Pittsburgh, page 449.

We quote warehouse prices, f.o.b. Chicago: No. 9 and heavier black annealed wire and No. 9 and heavier bright basic wire, $2.95 per 100 lb.; common wire nails, $3.10 per 100 lb.; cement coated nails, $2.60 per keg.

Sheets.—Users are now dependent largely on Eastern mills for new supplies and are finding it difficult to place orders for early shipment. Galvanized is particularly scarce.

Mill quotations are 3.15c. to 3.30c. for No. 28 black, 2.40c. to 2.50c. for No. 10 blue annealed and 4.15c. to 4.30c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.
Jobbers quote blue annealed, 3.90c.; black, 4.60c.; galvanized, 5.60c.

Structural Material.—Structural mills continue to receive liberal orders for indefinite delivery, indicating that building activity is still buoyant in spite of the hindrances due to the two nation-wide strikes. Fabricating awards are still fairly numerous and some attractive new projects are making their appearance. Plain material for early shipment is bringing as high as 2c. and 2.10c., base Pittsburgh.

The mill quotation on plain material for indefinite delivery is 1.90c. to 2c., Chicago. Jobbers quote 2.80c. for plain material out of warehouse.

Plates.—The Standard Oil Co. has placed 46 oil storage tanks of 80,000 barrels capacity in addition to the 33 tanks reported awarded last week. Of the total of 79 tanks, 42 will be fabricated by the American Bridge Co. and 37 by the Chicago Bridge & Iron Works. Fully 24,000 tons of steel is involved. New orders for plates are above the average in tonnage, notwithstanding the fact that local mills are booking only for indefinite delivery. Specifications from carbuilders are heavy. Plates for early shipment are commanding 2c. Pittsburgh.

The mill quotation for indefinite delivery is 1.90c. to 2c., Chicago. Jobbers quote 2.80c. for plates out of stock.

Reinforcing Bars.—Reinforcing bar distributors still have fair stocks of bars on hand, but replenishments from the mills are becoming so uncertain that they are selling cautiously, concentrating their attention on satisfying the imperative needs of customers. In line with the recent advance in mill prices, bar distributors have raised their warehouse quotation on reinforcing bars to 2.50c., Chicago. The paralyzing effect of the railroad and coal strikes is commencing to be felt and it is notable that fewer new building projects involving bars are appearing. Considerable highway work, however, is still in prospect. Recent awards include:

Advance-Rumely Co., warehouse, Omaha, Neb., 210 tons, to Concrete Steel Co.

Kansas City Title & Trust Co., building, Kansas City, Mo., 135 tons, to Concrete Steel Co.

High school, Maquoketa, Iowa, 120 tons, to Concrete Steel Co.

Convent, Milwaukee, Wis., 70 tons, to Concrete Steel Co.

Pending business includes:

Illinois State Highway Commission, highway work, 1200 tons, bids to be opened Aug. 18.

Chicago, Burlington & Quincy Railroad, two-story addition to Chicago freight house, 100 tons.

Wisconsin General Hospital, Madison, Wis.: 350 tons, to Corrugated Bar Co.

Cast-iron Pipe.—Shops located in the South are finding it difficult to make deliveries north of the Ohio River. Inquiry is not so active on account of the season and the national strikes. Minneapolis took bids yesterday on 1100 tons and Roanoke, Ill., receives tenders on 110 tons Aug. 29. Detroit takes bids today on 800 tons, instead of 200 tons as stated last week. Hinsdale, Ill., has placed 100 tons with the American Cast Iron Pipe Co. and is in the market for 1100 tons additional.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $50.20 to $51.20; 6-in. and above, $46.20 to $47.20; class A and gas pipe, $3 extra.

Rails and Track Supplies.—New business in rails is light, a few orders aggregating 2000 tons having been placed by frog and switch makers. Four large Western roads, however, are working out their 1923 requirements with the likelihood that formal inquiries will be issued within a few weeks. Track fastening orders are still fairly numerous. Standard spikes are now quoted at a minimum of 2.60c. Chicago, while the bottom on track bolts is 3.60c. Chicago.

Standard Bessemer and open-hearth rails, $40; light rails rolled from new steel, 1.75c., f.o.b. makers' mills.

Standard railroad spikes, 2.60c. to 2.75c., Pittsburgh; track bolts with square nuts, 3.60c. to 3.75c., Pittsburgh; tie plates, steel and iron, 2c., f.o.b. mill; angle bars, 2.40c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.40c. base and track bolts 4.40c. base.

Steel Castings.—Most outstanding castings business has been closed and foundries are generally running full or nearly so. Due to a widespread use of oil in the open hearths, the coal strike has not forced curtailment of operation. Costs, however, are increasing, and an early advance in prices is looked for.

Warehouse Prices.—Local warehouses have announced advances of 10c. per 100 lb. on bars, plates, shapes, hoops, bands, rivets, track spikes, and bolts, and 15c. per 100 lb. on sheets, cold rolled bars and shafting. The new quotations are to be found under the appropriate paragraphs.

Coke.—The local by-product producer has advanced foundry coke to $13.50, delivered Chicago switching district. For Milwaukee the price is now $13.50, f.o.b. Milwaukee ovens. Demand for prompt foundry coke has almost reached the point of a panic. Mills are no longer concerned about prices; they want deliveries to avert a shut-down. There is practically no Connellsville coke reaching here. Some shipments of New River coke, which is quoted at $12, ovens, have managed to get through, and the same can be said of some brands of Southern coke, which are bringing $13 to $13.80, delivered Chicago. The available supply of coke, however, does not meet the demand, and if foundries are forced to shut down it will be due more largely to lack of fuel than of pig iron.

Old Material.—Current demand is widely distributed and is principally for small tonnages for prompt shipment. Gray iron, malleable and steel foundry grades are notably active, but there is little movement of iron mill grades or heavy melting, the last important sale of the latter having been made ten days ago. Railroads are not only tardy in making shipments, but their new offerings are almost nil. This fact, coupled with a general shortage of scrap for prompt shipment and an effort on the part of numerous users to hasten deliveries from sellers, has given the market added strength, numerous grades having advanced. The Chicago Great Western offers 200 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton	
Iron rails	$19.50 to	$20.00
Cast iron car wheels	20.50 to	21.00
Relaying rails	22.50 to	27.50
Rolled or forged steel car wheels	19.00 to	19.50
Rails for rerolling	16.50 to	17.00
Steel rails, less than 3 ft.	18.50 to	19.00
Heavy melting steel	15.75 to	16.25
Frogs, switches and guards cut apart	15.75 to	16.25
Shoveling steel	15.25 to	15.75
Drop forge flashings	11.50 to	12.00
Hydraulic compressed sheet	13.00 to	13.50
Axle turnings	14.00 to	14.50
Per Net Ton		
Iron angles and splice bars	18.50 to	19.00
Steel angle bars	15.00 to	15.50
Iron arch bars and transoms	19.00 to	19.50
Iron car axles	23.50 to	24.00
Steel car axles	16.20 to	16.75
No. 1 busheling	13.00 to	13.50
No. 2 busheling	7.50 to	8.00
Cut forge	14.25 to	14.75
Pipes and flues	11.00 to	11.50
No. 1 railroad wrought	14.50 to	15.00
No. 2 railroad wrought	14.25 to	14.75
Steel knuckles and couplers	17.00 to	17.50
Coil springs	17.50 to	18.00
No. 1 machinery cast	18.50 to	19.00
No. 1 railroad cast	17.00 to	17.50
Low phos. punchings	15.00 to	15.50
Locomotive tires, smooth	13.50 to	14.00
Machine shop turnings	9.50 to	10.00
Cast borings	11.50 to	12.00
Stove plate	14.75 to	15.25
Grate bars	15.00 to	15.50
Brake shoes	15.25 to	15.75
Railroad malleable	17.00 to	17.50
Agricultural malleable	17.00 to	17.50

Activity in Springfield, Ohio

SPRINGFIELD, OHIO, Aug. 8.—All three piano plate plants in this city are operating with good-sized forces. The manufacturers say that they look for a steady improvement in business. Owing to the receipt of substantial orders for water turbines the James Leffel & Co.'s plant started Monday on a late run. The plant is now being operated until 8.15 p. m., according to announcement made by President A. F. Sparks. The present demand is for medium-sized turbines.

The next meeting of the district association of the Ohio Foundrymen's Association will be held in Springfield in September. The Ohio association will meet in Cleveland next month.

General Manager George Ireland, of the Steel Products Engineering Co., reports orders for dies and tools for automotive manufacturers in Detroit. These orders and others from the Government will require running overtime.

Although general prospects are good, there has been a slowing up at the plant of the Buffalo-Springfield Roller Co. The company is constructing an addition, 60 x 150 ft., to be used as an assembly room.

Equipment for Open-Hearth Plant

CHICAGO, Aug. 15.—The Wisconsin Steel Works, South Chicago, has let orders for the following equipment for its new open-hearth plant to the Alliance Machine Co., Alliance, Ohio: One 175-ton ladle crane, one 100-ton ladle crane, two open-hearth charging machines, two 10-ton overhead electric traveling cranes, one spare 10-ton trolley, two 7½-ton overhead electric traveling cranes.

New York

Little Steel Buying and Prices Higher—Large Sale of Low Phosphorus Iron

NEW YORK, Aug. 15.—Troubles connected with the delivery of coal and coke continue. While pig iron prices advance only moderate relief is furnished by foreign importations, although some coal as well as pig iron is being received from England and much more is expected. In finished steel, a majority of the mills are out of the market and those selling are dealing as a rule only with their regular customers. Quotations are $1 and $2 higher than a week ago on such business as can be placed.

Pig Iron.—A sale of 4000 tons of copper free low phosphorus iron has been made by a Northern New York furnace for delivery at Worcester, Mass., the price being somewhat under $35, furnace. Very little of this grade is obtainable. Following sales amounting to about 2000 tons, one seller of foundry pig iron has advanced to a price of $31 for No. 2 plain and $32 for No. 2X for early delivery. The Bethlehem Steel Co. has opened its books for fourth quarter at the following prices: No. 2 plain, $30; No. 2X, $31; No. 1X, $33, at furnace. It is believed that there will be no trouble in making sales for early delivery on the basis of $30 for No. 2 plain, although the last sales were $1 lower. The scarcity of domestic iron is more pronounced and sellers of foreign grades are more active, but the only new sale amounting to any considerable tonnage was 1000 tons of foundry iron to be imported from England. Prices of foreign iron are advancing and the minimum on Scotch, analyzing from 2 to 3 per cent silicon, now seems to be $28, while as high as $30 is asked. On high phosphorus iron from England and the Continent, there is a wide range in prices, from $22 to $27 being quoted. Buyers are not placing orders for foreign irons with much enthusiasm, owing to the uncertainty as to delivery and analysis. For delivery within Greater New York, a charge of about $1.50 must be added to the seaboard quotation.

Coke.—Difficulties in delivering coke are still great and prices high. For Connellsville grades, $14.25 to $14.75 is quoted for furnace coke and $15.50 to $16.50 for foundry. For by-product coke the nominal quotation is $14, but owing to an order of the New Jersey Fuel Commission requiring priority to be given public utility companies, very little can be delivered to foundries at present. A sale of coke for shipment from Terre Haute, Ind., to Buffalo was made on a basis of $12.50, Terre Haute ovens.

We quote delivered in the New York district as follows, having added to furnace prices $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$33.77 to $34.27
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	32.77 to 33.27
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	31.77 to 32.27
Buffalo, sil. 1.75 to 2.25	32.91 to 33.91
No. 2 Virginia, sil. 1.75 to 2.25	31.44 to 32.44

Warehouse Business.—All warehouses including the Carnegie Steel Co. and the leading independent have increased prices. Bars, shapes and plates have been advanced 10c. per 100 lb. Hoops and bands have risen 25c., the quotation now being 3.63c. One large warehouse states that the market is stronger than it has been for the past two years. Blue annealed sheets have advanced 15c., now being quoted at 3.93c. No change has been marked in black or galvanized. Mill quotations on spring steel, which now range up to 2.35c. per lb. base, Pittsburgh, are being quoted consistently at 4c. at all warehouses. Brass and copper remain steady, the only change being noted in cold-rolled copper sheets, 14 oz. and heavier, which are quoted at 3c. advance over hot-rolled. The spread between mill and warehouse continues at about $12 per ton.

Cast Iron Pipe.—Prices are strong and some foundries have increased quotations slightly. While foundries in this district are fairly well situated for pig iron, the coal shortage is being felt as shipments received become smaller. No municipal buying is in evidence at present, probably because of the realization by cities that purchases now would be rather uncertain as to delivery. The low bidder on the 2500 tons of pipe for the city of Poughkeepsie was the Warren Foundry & Machine Co., but alternate bids were also received on steel pipe and decision has not been made as to the type which will be purchased. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $54.50; 4-in. and 5-in., $59; 3-in., $64.80, with $4 additional for Class A and gas pipe.

Ferroalloys.—Sales of one lot of 500 tons and several lots of 50 and 100 tons each of British ferromanganese are reported for September and September-October shipment at the prevailing quotation of $67.50, seaboard. There is a fair demand for spiegeleisen and some domestic 20 per cent alloy is available at an advanced price of $3 per ton, or $39, furnace. One lot of British spiegeleisen has reached the seaboard and a little more is on the way. Buying of 50 per cent ferrosilicon is confined to small and carload lots at the prevailing quotations which are unchanged. No activity is reported in Brazilian or Indian manganese ore, but the receipt of several cargoes of Russian ore is reported. Quotations are as follows:

Ferromanganese, domestic, seaboard, per ton,	$67.50 to $70.00
Ferromanganese, British, seaboard, per ton,	$67.50 to $70.00
Spiegeleisen, 17 to 19 per cent	$38.00
Spiegeleisen, 20 per cent	$39.00
Ferrosilicon, 50 per cent, delivered, per ton,	$52.00 to $55.00
Ferrosilicon, 10 to 15 per cent, delivered, per gross ton	$38.00 to $40.00
Ferrotungsten, per lb. of contained metal	.40c. to 50c.
Ferrochromium, 6 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr., delivered	.12c. to 14c.
Ferrovanadium, per lb. of contained vanadium,	$3.00 to $3.50
Ferrocarbontitanium, 15 to 18 per cent, in carloads, per net ton	$200.00
Ores	
Manganese ore, foreign, per unit, seaboard	28c. to 30c.
Tungsten ore, per unit, in 60 per cent concentrates, nominal	$3.25 up
Chrome ore, basis 48 per cent Cr_2O_3, crude, per ton, Atlantic seaboard	$15 to $18.50
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	45c. to 50c.

Old Material.—The market continues strong and some prices show an upward tendency. Most of the present buying is from eastern Pennsylvania mills. Western Pennsylvania mills are extremely particular at present as to quality and are inclined to reject when material is not entirely up to grade. No. 1 heavy melting steel continues firm, while railroad steel is now quotable at $11.75 to $12.25 per ton. There are some inquiries current from Japanese export houses for heavy melting steel for Japan, but the price evidently expected by these buyers is about $13 to $14 per ton, f.a.s. port.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard	$10.50 to $11.50
Steel rails, short lengths, or equivalent	11.75 to 12.25
Rerolling rails	12.50 to 13.00
Relaying rails, nominal	27.00 to 28.00
Steel car axles	17.00 to 18.00
Iron car axles	22.00 to 23.00
No. 1 railroad wrought	12.50 to 13.00
Wrought iron track	11.50 to 12.00
Forge fire	8.00 to 8.50
No. 1 yard wrought, long	11.00 to 11.50
Cast borings (clean)	9.75 to 10.75
Machine-shop turnings	9.25 to 10.25
Mixed borings and turnings	9.25 to 10.25
Iron and steel pipe (1 in. diam., not under 2 ft. long)	9.00 to 9.50
Stove plate	11.00 to 11.50
Locomotive grate bars	11.50 to 12.00
Malleable cast (railroad)	10.50 to 11.00
Cast-iron car wheels	13.50 to 14.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast	$18.00 to $19.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	16.50 to 17.00
No. 1 heavy cast, not cupola size	13.00 to 13.50
No. 2 cast (radiators, cast boilers, etc.)	12.00 to 12.50

Finished Iron and Steel.—Very little business in finished steel is being done because of the mill situation due to coal and coke shortage. A few companies are in fairly comfortable position and are taking orders moderately, but the majority of steel companies are entirely out of the market. Those which have anything to sell are taking care of their own customers principally and at prices which usually range from 2c., Pittsburgh, upward for plates, shapes and bars when prompt delivery is required. Plates are quoted from 2c. to 2.15c.; soft steel bars at 1.90c. to 2.15c. and shapes at 1.90c. to 2c., Pittsburgh. Bar iron makers now quote 1.80c., Pittsburgh, or higher for carload lots. The New

York Central has asked for bids by Aug. 21 on 30,000 railroad spikes. A sale of 100 tons of soft steel billets at $37, Pittsburgh, by an Eastern mill for shipment to New England illustrates the strength of the semi-finished market.

We quote for mill shipments, New York delivery, as follows: For indefinite delivery soft steel bars, structural shapes and steel plates, 2.14c.; for delivery in a number of weeks, soft steel bars, 2.24c. to 2.49c.; plain structural material, 2.24c. to 2.34c.; steel plates, 2.34c. to 2.49c.; bar iron, 2.34c.

Buffalo

BUFFALO, Aug. 15.

Pig Iron.—Seven furnaces are now in operation in this district, but it is generally believed that there will be about 50 per cent curtailment of this operation before the end of the current month. The one interest which has had iron to sell is rather reluctant to handle the volume of business available and has virtually adopted a policy of selling only to regular trade. This situation was brought about through the exhaustion of its stock of piled iron and the fact that the product of the one furnace in operation is being sold rapidly. There are no big inquiries coming into the Buffalo district; tonnages usually being from carload lots to 100 tons. There is no bright prospect with reference to the fuel situation in this vicinity and pig iron men generally feel that the situation will be worse before it is better. On scattered sales, prices range from $30 to $32 base. A broker sold a small lot of No. 2X iron for $31, whereas $32 has been done for No. 2 plain filling an emergency order. The Lackawanna Steel Co. has banked two of the four blast furnaces in operation.

We quote f.o.b. per gross ton Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sil.	$32.00
No. 2X foundry, 2.25 to 2.75 sil.	31.00
No. 2 plain, 1.75 to 2.25 sil.	30.00
Basic	26.00
Malleable	30.00
Lake Superior charcoal	33.28

Finished Iron and Steel.—Except on cold finished material, black sheets and bolts, there is hardly any other sales activity in this district. Occasionally small tonnages of bars are sold, but these sales are made conditional on immediate specifications and at a minimum of 2c. Some inquiries for small tonnages of reinforcing bars have come out within a few days. The one selling agency taking business in black sheets has established a base price of $3.30, but is not taking any galvanized business whatever. While the local branch of an independent which does a large business in tin plate has not withdrawn on this product, it is not pressing the selling but has withdrawn within the week on wire, pipe and spikes.

Warehouse Business.—Prices on cold-rolled round shafting advanced to 3.80c., effective Monday, Aug. 14, and further advances all along the line are expected before many days. A majority of buyers seeking warehouse material are asking for tonnages greater than warehouses can supply at the time. There is every likelihood that merchant business will be active throughout the remainder of the year, regardless of how quickly the coal and rail difficulties are settled.

We quote warehouse prices, Buffalo, as follows: Structural shapes, 2.85c.; plates, 2.85c.; soft steel bars, 2.75c.; hoops, 3.55c.; bands, 3.40c.; blue annealed sheets, No. 10 gage, 3.80c.; galvanized steel sheets, No. 28 gage, 5.60c.; black sheets, No. 28, 4.60c.; cold rolled round shafting, 3.80c.

Old Material.—Only one mill is buying heavy melting steel, while the others are not out of the market, but they are inactive for the present. There is a good demand for machinery cast scrap and low phosphorus and both grades of old material are scarce. Dealers are finding it difficult to obtain cars to ship material on old contracts.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel	$16.75 to $17.00
Low phos., 0.04 and under	18.00 to 19.00
No. 1 railroad wrought	16.00 to 16.50
Car wheels	17.00 to 18.00
Machine shop turnings	10.50 to 11.00
Cast iron borings	14.00 to 14.50
Heavy axle turnings	14.00 to 14.50
Grate bars	14.00 to 14.50
No. 1 busheling	15.00 to 15.50
Stove plate	15.00 to 15.50
Bundled sheet stampings	11.50 to 12.00
No. 1 machinery cast	18.50 to 19.50
Hydraulic compressed	15.00 to 15.50
Railroad malleable	17.00 to 17.50

St. Louis

ST. LOUIS, Aug. 15.

Pig Iron.—The week was marked by an active demand and increased prices in pig iron. The price of Northern iron has advanced to $28, f.o.b. Chicago for prompt shipment and $27 for shipment during the rest of the year, with a premium of $2 a ton for silicon 2.25 to 2.75. Southern iron is quoted at $20 to $21, Birmingham, but the railroad strike has so hampered shipments that there is virtually no movement of iron from the Birmingham district. The coal strike is making it increasingly difficult to produce iron. The Granite City maker is still on a 100 per cent production basis, and has made arrangements to move coal from the Kentucky fields by barge. Buying is more active, as users who thought they had been fully protected in their purchases now find they cannot get iron they had counted on and are looking about for material they will need. There is also an active demand for iron for third and fourth quarter delivery, and there is one inquiry before the market for 300 tons for first quarter of next year. There is still a most pressing demand for iron of high silicon. The principal sales of the Granite City maker were 850 tons of malleable for shipment to Ohio; 500 tons of malleable to an Indiana melter, and 100 tons to an Illinois foundry. Inquiries are being received here from Indiana and Ohio melters, who usually look to other markets for their supplies. The principal inquiries before the market are: 1000 tons of foundry iron for a South Bend, Ind., melter; 500 tons for another Indiana melter; 300 tons for a Columbus, Ohio, concern; 200 tons for a Quincy, Ill., user, 300 tons for a Terre Haute melter, and 400 tons for delivery September to December. The markets for ferroalloys are quiet this week.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago and $5.17 from Birmingham and 81 cents average switching charge from Granite City:

Northern foundry, sil. 1.75 to 2.25 (forward delivery)	$29.16
Northern malleable, sil. 1.75 to 2.25 (forward delivery)	29 16
Basic (third quarter)	29.16
Southern foundry, all rail, sil. 1.75 to 2.25	$25.17 to 26.17

Finished Iron and Steel.—The shortage of coal is curtailing production at steel mills so that it is becoming more and more difficult to place business. This fact seems to be generally recognized by the trade, and inquiries are being confined largely to material for which there is immediate need. The largest railroad inquiry of the week for material was from the Missouri-Kansas-Texas Railroad, which is in the market for 800 kegs of standard track spikes, the other inquiries being for material such as could be gotten readily from warehouse stock. The Wabash order for 240,000 tie plates, which inquiry was reported in THE IRON AGE of last week, went to the Illinois Steel Co., at a price understood to be $37, f.o.b. Chicago. A Tulsa manufacturer who last week bought 1000 tons of tank plates, bought 2000 additional tons this week, and there continues to be an active demand for tanks from the Oklahoma oil fields, a situation largely aided by the shortage of coal. Bids have been asked on the Shrine Hospital, St. Louis, W. B. Ittner, architect, involving about 200 tons of billet reinforcing bars, and the Bankers' Reserve Life Building, Omaha, F. A. Henninger, architect, in which 700 tons of structural steel will be used. The demand for tool steel is very active, a leading factor in the trade reporting that sales for August were much larger than for any month this year. Sheets are in good demand, but the mills seem to have none to offer.

For stock out of warehouse we quote: Soft steel bars, 2.70c. per lb.; iron bars, 2.70c.; structural shapes, 2.80c.; tank plates, 2.80c.; No. 10 blue annealed sheets, 3.85c.; No. 28 black sheets, cold rolled, one pass, 4.45c.; cold drawn rounds, shafting and screw stock, 3.50c.; structural rivets, $3.35 per 100 lb.; boiler rivets, $3.45; tank rivets, ⅞ in. and smaller, 60 per cent off list; machine bolts, large, 50 and 10 per cent; small, 50-10 and 10 per cent; carriage bolts, large, 55-5 per cent; small, 60 and 10 per cent; lag screws 60 per cent; hot pressed nuts, square or hexagon blank, $3.50; and tapped, $3.25 off list.

Coke.—Coke continues in big demand, with the sources of supply continually being made smaller because of the coal and railroad strike. Urgent demand is being made by users for shipments against pur-

chases. The Granite City by-product maker is still holding its production down to the minimum required to supply municipalities depending upon them for gas, while the local by-product plant has been out of the market for some time. The Granite City producer is taking orders for coke, subject to price prevailing when they are able to ship it. No coke is to be had from the South on account of railroad conditions. Some Connellsville coke is being sold on a basis of $15 a ton at the ovens.

Old Material.—The market for old material continues to advance. No scrap is coming in, the railroads not offering anything because of the scarcity of labor required to pick up the material, and consumers are eager to get supplies. Mills are showing considerable anxiety about material they have on back orders with dealers, and in some cases are giving a premium of $1 a ton for anything on which deliveries in ten days to two weeks can be guaranteed. There is a tremendous shortage in the specialty market. Cast scrap in car wheels is in very good demand.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

	Per Gross Ton	
Old iron rails	$17.75 to	$18.75
Rails for rerolling	16.75 to	17.25
Steel rails, less than 3 ft.	16.75 to	17.25
Relaying rails, standard section	25.00 to	28.00
Cast iron car wheels	19.50 to	20.00
No. 1 heavy railroad melting steel	15.50 to	16.00
No. 1 heavy shoveling steel	14.00 to	14.50
Ordinary shoveling steel	13.75 to	14.25
Frogs, switches and guards, cut apart	15.75 to	16.25
Per Net Ton		
Heavy axle and tire turnings	10.50 to	11.00
Steel angle bars	14.75 to	15.25
Iron car axles	24.00 to	24.50
Steel car axles	17.00 to	17.50
Wrought iron bars and transoms	19.00 to	19.50
No. 1 railroad wrought	13.50 to	14.00
No. 2 railroad wrought	13.00 to	13.50
Railroad springs	18.00 to	18.50
Steel couplers and knuckles	18.00 to	18.50
Cast iron borings	9.00 to	9.50
No. 1 busheling	12.00 to	12.50
No. 1 railroad cast	17.50 to	18.00
Stove plate and light cast	14.75 to	15.25
Railroad malleable	14.50 to	15.00
Pipes and flues	9.75 to	10.25
Machine shop turnings	9.25 to	9.75

Cincinnati

Pig Iron More Active and Prices Higher—Coke Advances

CINCINNATI, Aug. 15.

Pig Iron.—The market is showing more activity, both as regards inquiry and sales. Last week some fair-sized tonnages were booked, principally for Northern irons, as, with two exceptions, all Southern interests are out of the market for the present. One Southern furnace is quoting $21, Birmingham, for fourth quarter, and another has a small tonnage available for shipment in September, on which it is quoting $24, Birmingham. Northern furnace prices range from $28 to $30, sales having been made at both the minimum and maximum figures. A West Virginia melter bought 1100 tons of foundry and malleable grades at $28 to $30, Ironton basis. A central Ohio melter took 200 tons of malleable at $30, southern Ohio, furnace, and 100 tons of Lake Superior charcoal at $30, furnace. An Indiana melter is understood to have placed 500 tons of malleable with a Chicago district furnace at $28, and another Indiana melter took 200 tons of foundry at the same price. A southern Ohio melter bought 300 tons of foundry at $30, southern Ohio furnace, for fourth quarter. A sale of a round tonnage of basic to a northern Ohio melter is reported to have been made at the equivalent of $26, Valley. A Michigan melter placed an order for approximately 1500 tons of silvery, at a price understood to be around $38, furnace, for the grade purchased. The market on silvery is regarded as nominal, there being little iron under 9 per cent to be had, but it is at least $3.50 higher on grades obtainable. A Hamilton melter is inquiring for 1000 tons for September and October shipment; a Louisville melter for a similar tonnage; a local melter for 500 tons of foundry and 100 tons of Bessemer. Two inquiries from Indiana total 1000 tons. Practically all Southern furnaces are reported to be piling their make, as embargoes have been placed on all open top equipment. Shipments are coming through slowly and the practice of borrowing iron to keep running is being more generally resorted to. Norton Furnace at Ashland, Ky., has been banked on account of the fuel situation.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$24.05 to $25.05
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	24.55 to 25.55
Ohio silvery (nominal), 8 per cent	38.27
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	30.27 to 32.27
Basic Northern	28.27
Malleable	30.27 to 32.27

Plant Operations.—All plants in the Cincinnati district are running at last week's schedule, the rail and coal strikes having caused only slight inconvenience. With the exception of lines serving the South, traffic is moving away from steel mills in good shape, and consumers are suffering little from delayed shipments. Pittsburgh district mills are moving tonnages by the river route to points as far as Louisville, but owing to the low stage of the Ohio, it has been found impossible to send heavily laden barges to points below that city.

Finished Material.—Consumers are more concerned with securing deliveries on contracts than in placing new business, and as a result the market is rather quiet. The only inquiry of consequence comes from a large tank manufacturer, who is in the market for approximately 700 tons of plates. Repair work taken by car manufacturers in this district has also caused a good demand for plates, and a recent inquiry called for approximately 5000 tons. While the ruling price apparently is 1.80c., this is for rather indefinite delivery. A Youngstown mill which recently resumed operations is understood to have booked a heavy tonnage at 2c., and is now contemplating an advance to 2.15c. The demand for sheets has fallen off considerably, as most consumers are covered for third quarter requirements. Speculation is keen as to prices mills will name for fourth quarter, and if the rail and coal strikes continue for an indefinite period, considerably higher prices are looked for. There is a fair demand for steel pipe, coming mostly from jobbers whose stocks are running low. The wire market is fairly active, nails particularly being in good demand. A southern Ohio mill has advanced its prices 10c. a keg, to $2.50 mill. Pittsburgh district mills, which had been equalizing the Ironton rate on nails, have abandoned this practice, and are quoting strictly on an f.o.b. Pittsburgh basis, with rail freight added. There was little activity in the structural field. The Pollak Steel Co. has taken 200 tons of bars for a school building in Cincinnati. A 10-story office building in Cincinnati, permit for which has been secured but no contract let, will take approximately 400 tons of bars. Tank manufacturers report a large number of repair orders, and while they are having no difficulty in securing plates on their contracts, shapes are coming in slowly, and they are forced to depend on local warehouses to take care of rush orders.

Warehouse Business.—Jobbers' stocks are moving in heavy volume as a result of the railroad situation, and some of them report having difficulty in replacing steel. The demand for reinforcing bars and small angles is particularly insistent, with nails and other wire products also moving at a greatly increased rate. Prices are very firm, and it is expected that an advance in nail prices will be made shortly. In the meantime, quotations are unchanged.

Jobbers quote: Iron and steel bars, 2.75c. base; hoops, 3.60c.; bands, 3.35c. base; shapes and plates, 2.85c. base; reinforcing bars, 2.82½c. base; cold-rolled rounds, 3.50c. base; flats, squares and hexagons, 4c. base; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, 4.50c.; No. 28 galvanized sheets, 5.50c.; No. 9 annealed wire, $2.70 per 100 lb.; common wire nails, $2.85 per keg, base.

Coke.—The coke situation is tightening and prices are steadily advancing. Very little coke is available from any district, although by-product producers are shipping steadily on contracts, and coke is moving in slightly better volume. Prices are higher, Connellsville being quoted at $17, New River $15, Pocahontas $14, and Wise County $13. By-product fuel on August com-

mitments remains unchanged at $9, Connellsville basis, but September prices will, it is expected, show an advance of at least $1. A West Virginia steel company is in the market for 5000 tons.

Old Material.—On account of the railroad situation there is little activity in the scrap market. A blast furnace out of the district has sent out an inquiry for approximately 2000 tons of turnings, and this is being worked on. Rolling mill grades are very quiet.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

Per Gross Ton	
Bundled sheets	$8.00 to $8.50
Iron rails	13.50 to 14.00
Relaying rails, 50 lb. and up	26.50 to 27.00
Rails for rerolling	13.50 to 14.00
Heavy melting steel	13.00 to 13.50
Steel rails for melting	13.00 to 13.50
Car wheels	14.50 to 15.00
Per Net Ton	
No. 1 railroad wrought	11.50 to 12.00
Cast borings	9.00 to 9.50
Steel turnings	8.00 to 8.50
Railroad cast	14.00 to 14.50
No. 1 machinery	17.00 to 17.50
Burnt scrap	9.50 to 10.00
Iron axles	18.00 to 18.50
Locomotive tires (smooth inside)	11.00 to 11.50
Pipes and flues	6.50 to 7.00

Birmingham

BIRMINGHAM, ALA., Aug. 15.

Pig Iron.—Iron deliveries had grown so difficult so far as north of Nashville is concerned at the close of last week that Alabama makers had begun declining new business for prompt delivery because unable to make promises in that respect. The market might be said to be a $20 one for the usual run of business, but 15,000 to 20,000 tons for third and fourth quarter delivery to pipe concerns brought a base not much above $19. Competitive buying markets reported a base of $19.50 to $21 for Birmingham iron last week. Some lots are known to have brought over $20, but one large maker was quoting $19.50 to $20 on competitive business. But for the large consumption in the Birmingham district, several blast furnaces would probably have banked by this time, but this consumption remains at an unprecedented level and, delivery being a matter of switching, yard stocks are not piling iron as would otherwise be the case. However, the car shortage for delivery purposes out of the district is more and more acute and, if the rail strike lasts much longer, there will be some decrease in production. For the present, that has not been curtailed either at blast furnaces or at consuming plants. Pressure pipe plants are turning out more tonnage than in their history and in that quarter deliveries are fairly satisfactory so far as the South and Southeast are concerned. The blast furnace of the Central Coal & Iron Co. did not blow in last week as was expected. It was decided to wait on a less embarrassing car situation. Stocks of iron of the Sloss-Sheffield Steel & Iron Co., at Providence, R. I., which were piled two years ago, are understood to be dwindling with base of $20 being obtained from New England consumers. The 22 active furnaces on the first of the month are still active. All makers are piling some iron.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	$19.50 to $20.00
Basic	18.50 to 19.00
Charcoal, warm blast	30.00 to 32.00

Finishing Mills.—There has been no curtailment of production at finishing mills, although complaint of the car shortage for deliveries is growing. The Tennessee company continued double turn this week at Bessemer, Fairfield and Ensley mills with 100 per cent ingot production. The American Steel & Wire Co., the Gulf States Steel Co. and the Conners Steel Co. maintain undiminished production in finishing mills. Structural steel works are very busy.

Cast Iron Pipe.—There has not been much new business in the pipe market, but all plants labor under an accumulation of orders. The high pressure base remains at $37 and that of sanitary pipe at $60 with some sales at $65. The pipe melt is the largest on record.

Coal and Coke.—Alabama's coal production is the largest on record, having reached 405,000 tons a week. Western railroads furnish a large supply of cars for the extra demand in that quarter. All industries so far are getting the coal required for operation. Spot coal is easily selling for $4, sometimes more. Coke is in very strong demand with spot base very close to $7. Still higher prices have been obtained. The production is at a maximum.

Old Material.—The old material market is steady and the quoted prices are brought in actual transactions. No. 1 cast is up $1 and larger quantities are leaving yards than in some time.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails	$13.00 to $15.00
No. 1 steel	16.00 to 17.00
No. 1 cast	15.00 to 16.00
Car wheels	15.00 to 16.00
Tramcar wheels	14.00 to 15.00
Stove plate	13.00 to 14.00
Cast iron borings	6.00 to 7.00
Machine shop turnings	4.00 to 5.00

Boston

BOSTON, Aug. 15.

Pig Iron.—Buffalo and western and eastern Pennsylvania furnace shipments of iron into this territory are backward. The demand for spot iron, therefore, is more active. Some foundries with more No. 2X and No. 1X than wanted have resold to other foundries, but the supply of such iron is limited. Buyers are forced to take Alabama or foreign iron if round tonnages are wanted. Sales of Alabama for the past week aggregate 1500 tons, mostly No. 2X and No. 1X, for August and September delivery at $30 dock Providence, R. I., base, and for fourth quarter at $20 furnace base. Sales of foreign again totaled 5000 to 6000 tons, mostly Scotch, for August and September arrival. Buying for last quarter has diminished. The largest individual sale was 1500 tons Scotch equal to our No. 2X and No. 1X, to a Massachusetts melter, August shipment. Foreign irons are higher. Scotch, the past week, sold at $28 to $32 dock here, English at $28 to $30, Belgian at about the same price, and French at $27 to $29. On Saturday last, 1000 tons Middlesboro, Eng., iron arrived on order at this port. This lot originally was shipped in July, but the steamer was forced to return to port for repairs. Other lots of English, as well as of Scotch, are due to arrive within the next ten days or two weeks. A small tonnage of Scotch, August delivery, is offered at $29.50, dock Bridgeport, Conn. Inquiries in the market aggregate several thousand tons. Business in foreign iron has been hampered by serious delays in cable service. A special sale of 150 tons of Buffalo, silicon 3.25 to 3.75, October-November shipment, at $31 furnace, is reported, which figures out about $29 furnace base.

We quote delivered prices, on the basis of the latest reported sales, now infrequent, and as follows, having added to furnace prices $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75	$32.15 to $34.15
East. Penn., sil. 1.75 to 2.25	31.65 to 33.65
Buffalo, sil. 2.25 to 2.75	30.41 to 31.41
Buffalo, sil. 1.75 to 2.25	29.91 to 30.91
Alabama, sil. 2.25 to 2.75	29.60 to 30.10
Alabama, sil. 1.75 to 2.25	29.10 to 29.60

Warehouse Business.—Warehouse prices on iron and steel are very firm. Some interests are getting 3c. per lb. for merchant bars and slightly better for concrete bars, the latter being in comparatively short supply. A majority of warehouses, however, are on a basis of $2.75½ for merchant bars, stocks of which are in fairly good condition. The supply of steel bands is shortening, and prices for same are stiff. The general movement of iron and steel out of warehouses holds up well, being better than at any previous period this year. Bolts and nuts are moving in reasonable quantities and prices are firm. Nails and rivets are in fair demand. Cap and set screws are up 5 per cent at 65 and 5 per cent discount.

Jobbers quote: Soft steel bars, $2.75½ per 100 lb. base; flats $3.40½; concrete bars, $2.90 to $3.03; structural steel, $2.75½ to $2.90½; tire steel, $4.15 to $4.50; open-hearth spring steel, $4.50 to $6; crucible spring steel, $11.50; steel bands $3.90; hoop steel, $4.40; cold rolled steel, $3.50 to $4; refined iron, $2.75½; best refined iron, $4.25; Wayne iron, $3.50; Norway iron, $6 to $6.50; plates, $2.85½ to $3.04; No. 10 blue annealed sheets, $3.90 per 100 lb. base; No. 28 black sheets, $4.90; No. 28 galvanized sheets, $5.90.

Finished Material.—New England producers of iron and steel by-products, generally speaking, are less concerned over coal than they are over metal supplies. This territory is so located geographically it can easily draw on British and Dominion coals in a pinch. Consumption of electric power and fuel oil is on the increase, especially at inland industrial centers like Worcester and Springfield, Mass. New England bolt and nut makers report trouble in getting steel. Buffalo and Pennsylvania mills still refrain from taking on new business except at unspecified deliveries. Structural steel bookings are largely confined to small tonnages. Bids closed yesterday on 7200 lb. chrome alloy steel for barrels of machine rifles to be made at the Springfield, Mass., arsenal.

Coke.—Several thousand tons of English foundry coke are reported sold in this territory. One melter took 1500 tons for delivery during the next six to eight weeks. Prices for this fuel figure out slightly higher than New England by-product delivered within the $3.10 local freight points. The first cargo of English coke for Boston sailed Aug. 12. A second will shortly follow. Both the New England Coal & Coke Co. and the Providence Gas Co. are still quoting by-product foundry coke to apply to contracts at $16.50 delivered where the local freight does not exceed $3.10 a ton. They are not in the markekt for spot business. Crushed coke has been advanced another $2 a ton to $16 ovens. The producers, due to the scarcity of certain grades of coking coals, are unable to make deliveries as promptly as desired by the foundry trade.

Old Material.—New business the past week was limited to a few hundred tons of borings and turnings and miscellaneous material like horseshoes, shafting, etc., at unchanged prices. Round tonnages of cast iron borings are wanted, but material is lacking. A moderate tonnage of heavy melting steel, borings, turnings and bundled skeleton was shipped from this territory to Pennsylvania on old contracts.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$19.00 to $20.00
No. 2 machinery cast	17.00 to 18.00
Stove plate	15.50 to 16.50
Railroad malleable	15.00 to 15.50
Street car wheels	18.00 to 19.00

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$11.00 to $11.50
No. 1 railroad wrought	11.50 to 12.00
No. 1 yard wrought	10.00 to 10.50
Wrought pipe (1 in. in diam., over 2 ft. long)	8.00 to 8.50
Machine shop turnings	9.00 to 9.50
Cast iron borings, rolling mill	9.50 to 10.00
Cast iron borings, chemical	12.00 to 12.50
Blast furnace borings and turnings	9.00 to 9.50
Forged scrap and bundled skeleton	8.00 to 8.50
Street car axles and shafting	14.50 to 15.00
Rails for rerolling	11.00 to 11.50

Philadelphia

Coke Shortage Causes Further Curtailment of Pig Iron Production—Prices Higher

PHILADELPHIA, Aug. 15.—Coal and coke shortage has caused further curtailment of pig iron production in the Eastern district. Fuel oil is saving the situation to some extent in the manufacture of steel, but as the pig iron shortage grows more acute, it will, of course, have its effect upon steel rollings, which up to this time have not suffered greatly. The Bethlehem Steel Co. now has only five of its 12 active furnaces in blast, three at Bethlehem, one at Steelton and one at Sparrows Point. Three furnaces at Bethlehem and two each at Steelton and Sparrows Point are banked. The Cambria Steel Co. on Sunday banked two additional furnaces at Johnstown, making three that are banked there, with two active. The Adrian furnace at Dubois, Pa., which was making merchant iron, went out of blast last Friday and the Warwick stack at Pottstown, which has been banked for more than two weeks, will probably be blown out this week. The Alan Wood Iron & Steel Co. has let its No. 3 furnace, the largest of its three stacks, go out of blast because of the fact that the Rainey-Wood Coke Co., from which it obtains by-product coke, has been called upon by the American Gas Association to furnish more coke to gas plants. The two active furnaces of the Alan Wood Iron & Steel Co. are making basic.

There is now an acute shortage of both pig iron and steel, so far as the ability of mills and furnaces to accept business is concerned, though this shortage has not seriously affected consumers in general as yet, many of them having stocks on hand. When a consumer is obliged to come into the market, it is now difficult, however, to obtain promise of early shipment of either pig iron or steel. The foundry pig iron situation is relieved to a certain extent by continued importations of foreign iron.

Meanwhile prices are rising,, bars, shapes and plates fetching from 2c. to 2.25c., Pittsburgh, according to the needs of the buyer and the attitude of the seller. Foundry pig iron is well above $30 for the higher silicon grades, either domestic or imported.

The iron and steel industry does not see much hope for early amelioration of its difficulties, even though the partial settlement of the bituminous coal strike at Cleveland should increase coal production speedily. It is believed that it will be at least 30 to 60 days before there is any appreciable relief in the coal and coke shortage. If steel companies which have their own non-union coal mines are obliged to pay practically the union scale to obtain miners, this would bring about an additional cost of 50c. to 60c. per ton for their coal. The scarcity of common labor at steel plants, already acutely felt at some points, is bound to become a more restrictive factor when the industry is operating at a fuller rate.

Pig Iron.—The banking of more blast furnaces, due to lack of coke, has created a more serious shortage of domestic pig iron, which is being relieved to some extent by continued importations of foreign iron. The cutting down of the Bethlehem Steel Co.'s active stacks from 12 to five has left that company in a position where it cannot take care of its merchant trade, while the banking of the Alan Wood Iron & Steel Co.'s No. 3 furnace leaves that interest without any foundry iron, the other two furnaces being on basic. The blowing out of the Adrian furnace, which is in the western Pennsylvania group, removes another source of merchant iron, considerable of its product having been shipped recently into this district. The Warwick furnace, which has been banked, will probably be blown out this week with considerable unshipped business on its books. The Wharton furnace of the Replogle Steel Co., Wharton, N. J., and the Brooke furnace are the only stacks now making foundry iron and these are selling in a very limited way at about $31 for No. 2 plain and $32 for No. 2X, f.o.b. furnace. Some consumers who have been getting sufficient domestic iron for their immediate needs are now turning to foreign iron as a protection against a possible shortage and sales of the latter are growing. A pig iron sales company with offices in Philadelphia, New York and Boston has bought about 25,000 to 30,000 tons of British and Continental iron, most of which is on the way and has been contracted for by melters. Scotch iron, 2.25 to 2.75 per cent silicon, is quoted at $31, c.i.f. Philadelphia, with higher silicon grades held at $33 to $34; English iron of standard phosphorus content is quoted at $28, c.i.f. Philadelphia, with higher phosphorus grades $1 a ton less, and Continental iron, in which the phosphorus runs from 0.80 to 1.75 per cent, is being sold at $26.50 to $27, c.i.f. Philadelphia. The buyer agrees to pay any duty that may be levied under the tariff bill now before Congress. There is a renewed demand for steel-making iron. A Pennsylvania plate manufacturer and a structural subsidiary of the Steel Corporation are in the market for a total of 10,000 to 20,000 tons of basic for early delivery, but furnaces are loath to quote. The Standard Steel Works Co. has bought 2000 tons or more of copper bearing low phosphorus iron at about $33, furnace, and the last of the copper free low phosphorus iron in the East, 4000 tons, which was in stock at a New York State furnace, has been sold to a Worcester, Mass., wire manufacturer at slightly under $35, furnace. An eastern Pennsylvania furnace making copper bearing low phosphorus iron last week sold about 4000 tons, a part of which brought $35, furnace, and it

is now quoting $40. A competing furnace is holding its price at $35. One of the important producers of eastern Pennsylvania foundry iron has opened its books for fourth quarter at $30 for No. 2 plain, $31 for No. 2X and $33 for No. 1X, f.o.b. furnace. The most important sale of domestic foundry iron the past week was to the Pennsylvania Railroad, covering its second half requirements, the amount being about 7000 tons. The business was taken by a western Pennsylvania furnace, but the price was not disclosed. Prices quoted below on basic, gray forge and malleable grades are nominal and do not represent the levels that consumers would now be obliged to pay.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia, and include freight rates varying from 76 cents to $1.64 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$32.14 to $32.64
East. Pa. No. 2X, 2.25 to 2.75	33.14 to 33.64
East. Pa. No. 1X	34.64
Virginia No. 2 plain, 1.75 to 2.25 sil.	29.17 to 30.17
Virginia No. 2X, 2.25 to 2.75 sil.	30.17 to 31.17
Basic delivery eastern Pa.	26.75 to 27.25
Gray forge	29.50 to 31.50
Malleable	29.00 to 30.00
Standard low phos. (f.o.b. furnace)	35.00
Copper bearing low phos. (f.o.b. furnace)	35.00 to 40.00

Ferroalloys.—There has been no change in the price of British ferromanganese, which remains at $67.50, Atlantic seaboard, but none is available for early shipment. Spot cars of ferromanganese, mostly resale material, have brought $75 and $80 per ton.

Semi-Finished Steel.—Very little semi-finished steel is being sold, but when quoted, it is usually on a basis of about $37.50, Pittsburgh, for rerolling quality and $42.50, Pittsburgh, for forging quality, some mills asking even higher prices.

Plates.—From the weakest of the heavy steel products, a few months ago, plates have become the strongest and prices above 2c., base, Pittsburgh, are obtainable when mills can promise early deliveries. The withdrawal of Pittsburgh, Youngstown and Chicago mills from the market has brought a large demand from the Central West to the few mills in the East that are accepting orders. The Lukens Steel Co., with three months business on its books, has attempted to withdraw from the market and has advanced its price to 2.25c., Pittsburgh. Another Eastern mill continues to sell at 2c., Pittsburgh, and this is to-day the minimum at which plates are to be had for early delivery. A Youngstown steel company started one of its plate mills to-day and is offering small lots to its regular customers at 2c., Pittsburgh, for desirable rollings and at 2.25c. for less desirable specifications. Many customers of the leading interest, unable to obtain deliveries, are turning to the independent mills. Instances of consumers paying $6 to $8 a ton more for plates than their contracts call for with other mills are frequent. The Union Pacific Railroad is inquiring for 65 locomotives and there are inquiries from two other roads totaling 30 engines. The Coatesville mills of the Midvale Steel & Ordnance Co. are rolling plates for about 100 engines recently booked by the Baldwin Locomotive Works. The Pennsylvania Railroad last week inquired for about 13,000 tons additional car repair steel, but is reported to have had difficulty placing all of the business. We quote sheared plates, ¼ in. and heavier, at 2c., Pittsburgh.

Structural Material.—Though occasional attractive lots of plain material have been sold by one producer at 1.95c., Pittsburgh, the current market for early delivery is more nearly 2c., while for 24-in. and other heavy beams buyers will pay 2.25c., Pittsburgh. There is a good demand, particularly from fabricators who are not getting deliveries as expected from their regular sources of supply.

Bars.—Steel bars are unobtainable except from one source at less than 2c., Pittsburgh. This one producer is selling a very little soft steel at 1.90c., Pittsburgh, most of its bars being for drop forging work. Bar iron makers have advanced their quotations to 2c., Pittsburgh, for carloads. While bar iron is fairly plentiful and is being substituted by some consumers for steel bars, the quantity of steel bars to be had is very limited. Few steel bar mills are taking business at any price.

Sheets.—There is a good demand for sheets, with mills quoting 2.50c. to 2.60c. for blue annealed; 3.30c. to 3.40c. for black and 4.30c. to 4.40c. for galvanized, all base Pittsburgh.

Wire Products.—Wire nails have been advanced to $2.60 and plain wire to $2.35 per 100 lb. by a Pittsburgh independent, an advance of $2 a ton.

Warehouse Business.—Prices for steel out of stock have been advanced $2 or more a ton, the new quotations going into effect to-day. We now quote for local delivery as follows:

Soft steel bars and small shapes, 2.80c.; iron bars (except bands), 2.80c.; round edge iron, 3c.; round edge steel, iron finish, 1½ x ½ in., 3c.; round edge steel planished, 3.75c.; tank steel plates, ¼-in. and heavier, 2.90c.; tank steel plates, ⅜-in., 3.10c.; blue annealed steel sheets, No. 10 gage, 3.50c.; black sheets, No. 28 gage, 4.30c.; galvanized sheets, No. 28 gage, 5.40c.; square twisted and deformed steel bars, 2.90c.; structural shapes, 2.90c.; diamond pattern plates, ¼-in., 4.80c.; ⅜-in., 5c.; spring steel, 3.50c.; round cold-rolled steel, 3.35c.; squares and hexagons, cold-rolled steel, 3.70c.; steel hoops, No. 13 gage and lighter, 4c.; steel bands, No. 12 gage to ⅜-in., inclusive, 3.45c.; rails, 2.80c.; tool steel, 8c.; Norway iron, 5.50c.

Manganese Ore.—About 3000 tons of Brazilian manganese ore, imported by a New York broker, is reported to have been sold to a Pittsburgh steel company at 29c. per unit, Baltimore.

Coke.—Ten cars of blast furnace coke were sold yesterday at $14.50, Connellsville. Foundry coke, when obtainable, is being sold at $15.50 to $15.75, Connellsville. A cargo of about 5000 tons of British by-product coke is on the way and all except about 1000 tons has been sold to gas plants at prices ranging from $14 to $15 c.i.f. Philadelphia.

Old Material.—The shortage of pig iron has created a better demand for scrap and prices have strengthened. Heavy melting steel has been sold within the past few days at $15, Nicetown, and $15.50, Claymont and Bethlehem, but it is doubtful if the lower price could be duplicated. Scrap brokers are holding for $15.50 to $16. Railroad and yard wrought, cast borings, No. 1 cast, stove plate, railroad grate bars and wrought iron and soft steel pipe are all at least 50c. a ton higher than a week ago. Blast furnace borings and turnings are firm, but not in much demand, owing to the wholesale banking of blast furnaces. We now quote for delivery at consumers' works in this district as follows:

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$15.00 to $15.50
Scrap rails	15.00 to 15.50
Steel rails, rerolling	17.00 to 17.50
No. 1 low phos., heavy 0.04 and under	22.00 to 24.00
Cast iron car wheels	17.50 to 18.50
No. 1 railroad wrought	18.00 to 18.50
No. 1 yard wrought	15.50 to 16.50
No. 1 forge fire	13.00 to 13.50
Bundled sheets (for steel works)	13.00 to 13.50
No. 1 busheling	12.50 to 13.00
No. 2 busheling	10.00 to 11.00
Turnings (short shoveling grade for blast furnace use)	13.00 to 13.50
Mixed borings and turnings (for blast furnace use)	13.00 to 13.50
Machine-shop turnings (for steel works use)	13.00 to 13.50
Machine-shop turnings (for rolling mill use)	13.50 to 14.00
Heavy axle turnings (or equivalent)	14.00 to 14.50
Cast borings (for steel works and rolling mills)	14.50 to 15.00
Cast borings (for chemical plants)	17.00 to 17.50
No. 1 cast	19.00 to 20.00
Railroad grate bars	15.50 to 16.00
Stove plate (for steel plant use)	15.00 to 16.00
Railroad malleable	15.00 to 15.50
Wrought iron and soft steel pipes and tubes (new specifications)	13.50 to 14.00
Shafting	21.00 to 22.00

Youngstown Takes More Hopeful View

YOUNGSTOWN, Aug. 15.—Youngstown iron and steel interests take a more hopeful view of the industrial coal outlook following the agreement in Cleveland between large operators and union miners. The action is also expected to have important bearing on non-union field operations. It is expected that non-subscribers in the Connellsville district, from which the bulk of the coal supply for Valley industries ordinarily comes, will gradually get back into production. Owing to the agreement, steel executives now see a possibility of averting important plant suspensions scheduled for the next two weeks under the present fuel supply.

Cleveland

Little Early Relief Expected from Partial Settlement of Coal Strike

CLEVELAND, Aug. 15.—The steel industry looks for little immediate relief from the partial settlement of the coal strike in the bituminous fields. Not much improvement in the situation is expected until the railroad strike is settled. A strike of the trainmen on the Louisville & Nashville Railroad Monday will probably tie up shipments of coal over that road from the non-union fields of Kentucky, on which Cleveland and several Valley mills are depending for fuel supply, and will make the fuel situation more acute. Transportation facilities on other roads bringing Kentucky coal to Cincinnati for Ohio steel plants are badly crippled and these apparently cannot increase their present limited coal shipments. Two furnaces were added to the idle list during the week. The American Steel & Wire Co. banked a Central furnace, leaving two in blast, and the Perry furnace at Erie went out. The Bourne-Fuller Co. is considering shutting down its steel plant as soon as its present pig iron supply is exhausted.

Semi-Finished Steel.—Considerable inquiry is coming out for round lots of sheet bars, slabs and billets for the fourth quarter, indicating that consumers are figuring on consuming semi-finished steel at about the same rate during that period as they have for the past few months. However, the leading local producer has not yet named the fourth quarter prices. The market is regarded as around $40.

Iron Ore.—Shipping conditions at the head of the lakes show further improvement. The Great Northern Railroad, which apparently has been the most seriously affected by the shopmen's strike, is now moving ore to Superior at about 90 per cent of normal. Shippers are still experiencing difficulty in moving ore over the Northwestern Railroad, particularly to Escanaba. At the lower end of the lakes the only difficulty reported is in shipments to southern Ohio points, cars not being available for ore because of the priority orders for the movement of coal. On Aug. 1 there was 7,396,842 gross tons of ore on Lake Erie docks as compared with 8,840,824 tons on the corresponding date last year. July receipts at Lake Erie docks were 6,646,679 tons as compared with 2,793,955 tons during the same month last year. Receipts at Lake Erie ports for the season until Aug. 1 were 11,949,884 tons as compared with 7,249,435 tons during the same period of 1921.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, $5.95; Old range non-Bessemer, 51½ per cent iron, $5.20; Mesabi Bessemer, 55 per cent iron, $5.70; Mesabi non-Bessemer, 51½ per cent iron, $5.05.

Coke.—Car lot sales of Connellsville foundry coke are reported at $15, but both the demand and supply are very light. Wise County foundry coke is quoted at $12 to $12.50 and New River coke at $15.

Pig Iron.—The Perry furnace of Pickands, Mather & Co., Erie, Pa., was blown out Sunday because of the fuel shortage and there is an increasing evidence of the scarcity of all grades of pig iron. However, demand is light, indicating that most foundries are supplied for their immediate requirements and prices have not been further advanced. In anticipation of their requirements, foundries sent in shipping orders a few weeks ago and some producers report that they are not being crowded for deliveries as much as they were last month. The only northern Ohio iron that is now available is being made by a local producer. This interest is so well sold up that it is taking orders only from consumers that are in urgent need of iron and report several sales ranging from car lots up to a few hundred tons. These sales were made at $30. Sales of small lots of Buffalo iron are reported at $31 for shipment to Valley points. There is no activity in basic iron, but it is doubtful whether this grade could be purchased below $27. Low phosphorus iron is fairly active, but is becoming very scarce and is firm at $35. We note the sale of 400 tons at that price to a Pittsburgh district consumer. Small resale lots of Ohio silvery iron have sold at the regular price of $32.50. Although there is a shortage of this grade the price on Ohio silvery iron has not been advanced since May.

Quotations below are f.o.b. local furnace for Northern foundry iron, not including a 50c. switching charge. Other quotations except basic and low phosphorus are delivered Cleveland, being based on a $3.02 rate from Jackson and a $6 rate from Birmingham:

Basic, Valley furnace	$27.00
Northern No. 2 fdy., sil. 1.75 to 2.25	30.00
Southern fdy., sil. 1.75 to 2.25	26.50
Malleable	30.00
Ohio silvery, sil. 8 per cent	35.00
Standard low phos., Valley furnace	$35.00 to 36.00

Finished Iron and Steel.—Mills are getting considerable inquiry for steel from consumers who are either unable to secure deliveries from or place orders with their regular sources of supply. With a number of producers entirely out of the market and deliveries getting further behind, consumers are finding it increasingly difficult to buy steel, and mills that can promise fairly early shipments have further advanced prices. About 8000 tons of plates for oil tank work are pending. The placing of this work seems to have been delayed because of the trouble tank shops are having in finding mills that can supply plates in time to meet the requirements of the oil companies. The Brier Hill Steel Co. started up its 132-in. plate mill to-day and can still promise early delivery. The minimum price on steel bars, plates and structural material is 1.80c., for indefinite delivery, but 2c. is the more general quotation, and higher prices are prevailing for early shipment. One Valley mill during the week advanced its price on plates from 2c. to 2.25c. for early shipment and some small producers are quoting as high as 2.50c. Some fabricators have advanced their quotations on structural work from $5 to $12 a ton owing to the advancing cost of steel. It is understood that approximately 2000 tons of structural material for additions to the Lima Locomotive plant was placed with an Eastern mill at 2c., and 350 tons of plates for the same job with a Valley mill at the same price. The Otis Steel Co. has sent out an inquiry for bids for its new steel plant requiring 9000 tons of structural material.

Jobbers quote steel bars, 2.66c.; plates and structural shapes, 2.76c.; No. 9 galvanized wire, 3c.; No. 9 annealed wire, 2.50c.; No. 28 black sheets, 4c.; No. 28 galvanized sheets, 5c.; No. 10 blue annealed sheets, 3.50c. to 3.61c.; hoops and bands, 3.31c.; cold-rolled rounds, 3.45c.; flats, squares and hexagons, 3.95c.

Old Material.—The McKinney Steel Co. has commenced to take shipments of heavy melting steel on contracts for round tonnages placed two years ago. Deliveries on this were held up when the company's plant was shut down. This scrap was purchased at various prices, some of it as high as $30 per ton. Price adjustments are being made with dealers having contracts for this scrap. It is claimed that these dealers either have the scrap in their yards or purchased and the releasing of the scrap by the consumer is not expected to stimulate buying. However, it is believed that the cleaning up of these contracts will have a stiffening effect on the market. The market continues dull but firm. Some consumers have held up shipments owing to curtailment of operations. Sales are reported by a local producer of 1500 tons of heavy melting steel scrap at $16.25 and 300 tons of shoveling turnings at $13.25, but these prices are somewhat above the usual market quotations.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel	$15.00 to $15.25
Steel rails, under 3 ft	15.25 to 15.50
Rails for rolling	15.75 to 16.25
Iron rails	14.00 to 15.00
Iron car axles	18.00 to 19.00
Low phosphorus melting	16.00 to 16.25
Cast borings	12.00 to 12.25
Machine shop turnings	12.00 to 12.25
Mixed borings and short turnings	12.00 to 12.25
Compressed steel	12.85 to 13.25
Railroad wrought	14.00 to 14.50
Railroad malleable	15.50 to 16.00
Light bundled sheet stampings	10.00 to 10.25
Steel axle turnings	13.00 to 13.50
No. 1 cast	17.00 to 17.50
No. 1 busheling	10.25 to 10.50
Drop forge flashings over 10 in	10.25 to 10.50
Drop forge flashings under 10 in	10.00 to 10.50
Railroad grate bars	13.75 to 14.25
Stove plate	13.75 to 14.25
Pipes and flues	10.00 to 11.00

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Plates

Sheared, tank quality, base, per lb.....1.80c. to 2.00c.

Structural Material

Beams, channels, etc.....1.80c. to 2.00c.

Iron and Steel Bars

Soft steel bars, base, per lb.....1.80c. to 2.00c.
Refined iron bars, base, per lb.....2.25c.

Hot-Rolled Flats

Hoops, base, per lb. .....2.50c. to 2.75c.
Bands, base, per lb. .....2.50c. to 2.75c.
Strips, base, per lb.....2.50c. to 2.75c.
Cotton ties, per bundle of 45 lb.....$1.11

Cold-Finished Steels

Bars and shafting, base, per lb.....2.25c.
Strips, base, per lb. .....4.00c.

Wire Products

Nails, base, per keg.....$2.40 to $2.60
Bright plain wire, base, per 100 lb..... 2.25 to 2.35
Annealed fence wire, base, per 100 lb..... 2.25 to 2.35
Galvanized wire, base, per 100 lb..... 2.75 to 2.85
Galvanized barbed, base, per 100 lb. ..... 3.05 to 3.15
Galvanized staples, base, per keg ..... 3.05 to 3.15
Painted barbed wire, base, per 100 lb. ..... 2.55 to 2.65
Polished staples, base, per keg ..... 2.55 to 2 65
Cement coated nails, base, per count keg.....1.90c. to 2.10c.
Woven fence, carloads (to jobbers).....73 per cent off list
Woven fence, carloads (to retailers)....70½ per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads,
60, 10 and 10 per cent off list
Machine bolts, small, cut threads....60 and 10 per cent off list
Machine bolts, larger and longer.....60 and 10 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads. 60 and 10 per cent off list
Cut threads .....60 per cent off list
Longer and larger sizes .....60 per cent off list
Lag bolts .....60, 10 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.:
Smaller and shorter.....50 and 10 per cent off list
Larger and longer sizes .....50 and 10 per cent off list
Hot pressed square or hex. blank nuts .....$4.50 off list
Hot pressed nuts, tapped .....$4.50 off list
C.p.c. and t. sq. or hex. nuts, blank .....$4.50 off list
C.p.c. and t. sq. or hex. nuts, tapped .....$4.50 off list
Semi-finished hex. nuts:
9/16 in. and smaller, U. S. S.....80 and 10 per cent off list
⅝ in. and larger, U. S. S...75 and 10 per cent off list
Small sizes, S. A. E. .....80, 10 and 10 per cent off list
S. A. E. ⅝ in. and larger..75 and 10 per cent off list
Stove bolts in packages .....80 and 5 per cent off list
Stove bolts in bulk .....80, 5 and 2½ per cent off list
Tire bolts .....65 per cent off list
Track bolts in carloads.....3.25c. to 3.50c. base
Track bolts, less than 200 kegs.....4.25c. to 4.50c. base

Cap and Set Screws

Milled square and hex. head cap screws,
75 and 10 per cent off list
Milled set screws.....75 per cent off list
Upset cap screws .....80 per cent off list
Upset set screws .....80 and 5 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb.....$2.65
Large boiler rivets, base, per 100 lb..... 2.75
Small rivets .....70 to 70 and 5 per cent off list

Track Equipment

Spikes, ⅞ in. and larger, base, per 100 lb.....$2.35 to $2.50
Spikes, ½ in. and smaller, base, per 100 lb..... 2.75 to 3.00
Spikes, boat and barge, base, per 100 lb..... 2.75 to 3.00
Track bolts, base, per 100 lb..... 3.25 to 3.50
Tie plates, per 100 lb. ..... 2.00 to 2.25
Angle bars, base, per 100 lb. 2.40

Welded Pipe

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛	54½	28	⅛ to ⅜.....	+ 3½	+22½
¼ to ⅜.....	60	33½	½	36½	18½
½	65	50½	¾	42½	27½
¾	69	56½	1 to 1½.....	44½	29½
1 to 3.....	71	58½			

Lap Weld

2	64	51½	2	39½	25½
2½ to 6.....	68	55½	2½ to 6.....	42½	29½
7 to 8.....	65	51½	7 to 12.....	40½	27½
9 to 12.....	64	50½			

Butt Weld, extra strong, plain ends

⅛	50½	33	¼ to ⅜.....	+ 4½	+37½
¼ to ⅜.....	56	38½	½	35½	23½
½	62	50½	¾	42½	28½
¾	67	55½	1 to 1½.....	44½	30½
1 to 1½.....	69	57½			
2 to 3.....	70	58½			

Lap Weld, extra strong, plain ends

2	62	50½	2	40½	27½
2½ to 4.....	66	54½	2½ to 4.....	43½	31½
4½ to 6.....	65	53½	4½ to 6.....	42½	30½
7 to 8.....	61	47½	7 to 8.....	35½	23½
9 to 12.....	55	41½	9 to 12	30½	18½

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 and 2½ per cent.

Boiler Tubes

Lap Welded Steel		*Charcoal Iron*	
1¾ in.	26½	1½ in.	5
2 to 2¼ in.....	41	1¾ to 1⅞ in.....	15
2½ to 3 in.....	52	2 to 2¼ in.....	25
3¼ to 13 in.....	57	2½ to 3 in.....	30
		3¼ to 4½ in.....	32

To large buyers of steel tubes a supplementary discount of 5 per cent is allowed.

Standard Commercial Seamless Boiler Tubes

Discounts on cold-drawn or hot-rolled tubes in carload lots, f.o.b. Pittsburgh, follow:

1 in.	60	2½ and 2¾ in.....	43
1¼ and 1½ in.....	52	3 in.	47
1¾ in.	36	3½ to 4 in.....	52
2 and 2¼ in.....	39	4½ in. to 5 in.....	44

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Tin Plate

Standard cokes, per base box.....$4.75

Terne Plate

(Per package, 200-lb.)

8-lb. coating	$9.30	25-lb. coating I. C.....$14.25	
8-lb. coating I. C.....	9.60	30-lb. coating I. C.....	15.25
15-lb. coating I. C.....	11.80	35-lb. coating I. C.....	16.25
20-lb. coating I. C.....	13.00	40-lb. coating I. C.....	17.25

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....2.40c. to 2.60c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.15c. to 3.40c.

Galvanized

No. 28 (base), per lb.....4.15c. to 4.40c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.15c. to 3.40c.

Manufacturers have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic.	$0.325	Buffalo	$0.265	St. Louis	$0.43
Philadelphia, export...	0.265	Cleveland	0.215	Kansas City	0.735
Baltimore, domestic...	0.315	Cleveland, Youngstown		Kansas City (pipe)...	0.705
Baltimore, export.....	0.255	Comb.	0.19	St. Paul	0.595
New York, domestic...	0.34	Detroit	0.295	Omaha	0.735
New York, export.....	0.285	Cincinnati	0.295	Omaha (pipe)	0.705
Boston, domestic	0.365	Indianapolis	0.31	Denver	1.275
Boston, export	0.285	Chicago	0.34	Denver (pipe)	1.215
				Pacific Coast	$1.50
				Pac. Coast, ship plates	1.20
				Birmingham	0.69
				Memphis	0.385
				Jacksonville, all rail..	0.50
				Jacksonville, rail and water	0.415
				New Orleans	0.515

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha, and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 30c. to 40c.; ship plates, 30c. to 40c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 30c. to 40c.; sheets and tin plates, 50c.; rods, wire rope, cable and strands, 75c.; wire fencing, netting and stretcher, 50c.; pipe, not over 8 in. in diameter, 50c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

NON-FERROUS METALS

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
Aug.	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
9.....	14.12½	13.75	32.12½	5.85	5.52½	6.65	6.30
10.....	14.12½	13.75	32.12½	5.87½	5.52½	6.60	6.25
11.....	14.12½	13.75	32.00	5.87½	5.52½	6.55	6.20
12.....	14.12½	13.75	32.12½	5.87½	5.52½	6.55	6.20
14.....	14.12½	13.75	32.12½	5.90	5.55	6.52½	6.17½
15.....	14.12½	13.75	32.12½	5.90	5.55	6.50	6.15

*Refinery quotation.

New York

NEW YORK, Aug. 15.

The markets are only moderately active, due to midsummer dullness and also to the effect of the strikes. Domestic buying of copper continues in fair volume with prices steady. The tin market is only moderately active. Demand for lead is not quite as heavy, but the market is stronger. A reaction in the zinc market has resulted in lower prices.

Copper.—The price situation in the electrolytic copper market continues unchanged and firm at 14c., delivered, or 13.75c., refinery, for delivery through October, with 14.12½c., delivered, or 13.87½c., refinery, for last quarter, with sales for domestic consumption in fairly good volume for both positions. There is some inquiry for first quarter. Several days ago there was some slackening in demand, due to industrial conditions, but in the last day or two business has increased both for domestic and foreign consumption. Lake copper continues firm at 14.12½c., delivered.

Tin.—Until toward the end of last week, when interruption of cable service became serious, the market for Straits tin had been dull and uninteresting, with business confined to light sales of spot and future delivery. Last Friday, however, Aug. 10, due to the cable difficulties, buyers became more anxious and came into the market and, as a result, fair sales were made, mostly to consumers, the total being close to 250 tons. The larger part of these sales were spot delivery, with some October shipment from the East, all at around 32c. Late in the same day there were offerings at 32.12½c., with buyers at 32.10c. Because of the cable situation business was done on Saturday, Aug. 12, in good volume with buyers at 32c. Yesterday about 250 to 300 tons of spot and nearby shipment changed hands at 32.12½c. for the former and 32.25c. for the later position. The market to-day has been very quiet, with quotation at 32.12½c., New York, for spot Straits. Quotations in the London market to-day were about £1½ per ton less than a week ago, with spot standard quoted at £159, future standard at £159 2s. 6d. and spot Straits at £160. Arrivals thus far this month have been 2050 tons with the quantity afloat reported as 4175 tons.

Lead.—This market continues very firm, with the volume of business not quite as heavy as in the last two or three weeks, but demand continues good and specifications on contract show no let-up. Prices in the outside market have been hardening until quotations have reached a level of 5.90c., New York, or 5.55c., St. Louis, but there has been no change in the asking price of the leading interest which continues at 5.75c., New York, and 5.55c., St. Louis.

Zinc.—About the middle of last week a slight reaction set in in this market with a distinct easing in prices; the issuing of statistics for July of the American Zinc Institute has caused this tendency to accelerate. These data showed a reduction in stocks for July smaller than had been generally expected and they also revealed an increase in the number of retorts in operation, amounting to 2322. These facts, coupled with the necessary decrease in consumption due to the strike, have had some effect upon the market. The production for July was 31,917 tons, or 3370 tons more than June, and the shipments are returned as 32,875 tons, or 6505 tons less than June. The surplus stocks at the end of July were 28,618 tons. The fact is pointed to, however, that the reserve stocks are less than a month's consumption, which has averaged about 32,000 tons thus far this year. Prime Western for early delivery is quoted and has sold at 6.15c., St. Louis, or 6.50c., New York, which we quote as the market, a decline of 15 points in the week. Demand, however, is fairly good.

Antimony.—The market is quiet and wholesale lots for early delivery are quoted unchanged at 5.25c. per lb., duty paid, New York.

Aluminum.—Wholesale lots of virgin metal, 98 to 99 per cent pure, are still obtainable from the leading interest at 19.10c. per lb., f.o.b. plant, for early delivery, while the same grade of foreign metal, imported by dealers, is offered at 17.75c. to 18c. per lb., New York, duty paid.

Old Metals.—Business has been fairly active this week and the market has been firm. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	13.50
Copper, heavy and wire	12.75
Copper, light and bottoms	11.25
Heavy machine composition	10.50
Brass, heavy	8.25
Brass, light	6.50
No. 1 red brass or composition turnings	9.00
No. 1 yellow rod brass turnings	7.50
Lead, heavy	5.00
Lead, tea	4.00
Zinc	3.75

Chicago

AUG. 15.—Some zinc users fearing a car shortage have shown anxiety to get immediate shipments. This prompt demand, however, has been insufficient to sustain the market. All of the metals are quieter, not alone zinc, but tin has declined. The old metals are unchanged. We quote, in carload lots, lake copper, 14.25c.; tin 33c. to 33.50c.; lead 5.60c.; spelter, 6.25c.; antimony, 7c.; in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 10.75c.; copper bottoms, 9.25c.; red brass, 8.75c.; yellow brass, 6.75c.; lead pipe, 4.50c.; zinc, 3.50c.; pewter, No 1, 20c.; tin foil, 22.50c.; block tin, 26c., all buying prices for less than carload lots.

St. Louis

AUG. 15.—The lead market is steady at 5.52½c. to 5.50c. carlots; slab zinc is steady at 6.30c. On old metals we quote light brass, 3.50c.; heavy red brass and light copper, 7c.; heavy yellow brass, 4c.; heavy copper and copper wire, 7.50c.; zinc, 2c.; lead, 3c.; pewter, 15c.; tin foil, 16c.; tea lead, 2c.; aluminum, 9c.

General Electric to Build Pacific Coast Factory

The General Electric Co. will build a new factory at Oakland, Cal., part of which will be devoted to increased facilities for the manufacture of switchboards and the remainder occupied by motor and instrument laboratories, service shops and offices. Official announcement of the project, which represents an investment of about $200,000, has just been made from the headquarters of the company at Schenectady.

The tract upon which the new factory will be erected comprises 23 acres on East Fourteenth and Fifty-fourth Streets, Oakland. The floor space of the factory will be 32,000 sq. ft. The building will be 131 by 236 ft., of brick and steel construction, with concrete floors and foundation, and will embody all the best features of modern construction. The contract has been let to the Foundation Co.

British Iron and Steel Market

American Coal Purchases Continue—America Has Bought 1,000 Tons of Cleveland Iron—All Prices Sag Except Galvanized Sheets

(*By Cable*)

LONDON, ENGLAND, August 15.

American demand for coal and coke continues and purchases are on a good scale. Canada also is inquiring for Welsh coal.

America is inquiring for ferromanganese and special and foundry pig iron, but the business done is unimportant; 1000 tons of special Cleveland foundry iron was sold last week for prompt shipment. Further business has been hampered by an increase in freight rates from Glasgow to Boston.

Scotch foundry iron has hardened to £5 5s. ($23.42) f.o.b. Other makes of pig iron show an easy tendency and home buying is dull. Italy is buying hematite. Makers are anxious to reduce stocks, which makes prices easier. Germany has been buying hematite; 500 tons of East Coast mixed numbers have been sold.

Export inquiry for finished steel is improving. India and Australia are buying plates, sheets and angles, but no large tonnages are involved. Home trade price fixing on finished steel was temporarily abandoned last week, and quotations generally are lower. Some works are not disposed to accept the new prices. Substantial orders for structural material have been placed on the Northeast Coast.

Iron and steel exports for July amounted to 251,473 tons.

There is improved Continental demand for steel, but it is difficult to set prices, owing to vagaries in exchange. South America, Chile and China have purchased plates. Sales have been made of merchant bars, angles, tees and sheets. India and Japan are endeavoring to resell wire, wire nails and plates. Belgian wire nails are now quoted at 14s. ($3.12) basis f.o.b., for October and November shipment.

Tin plate is easier for forward position, due to poor demand. South America and Canada are inquiring and Welsh makers anticipate securing orders. European buying is dull. Wasters stocks are decreasing. Welsh output was reported last week to be between 80 and 85 per cent of normal.

Demand for galvanized sheets is increasing and quotations are firm. South America paid £16 10s. (3.29c. per lb.) basis, f.o.b.

Continental black sheets have been sold at £10 7½s. (2.07c. per lb.) c.i.f., India. Japan is inquiring here, and also offering to resell.

We quote per gross ton, except where otherwise stated, f.o.b. maker's works, with American equivalent figured at $4.46 per £1, as follows:

Durham coke, delivered	£1	6¾s.				$5.96	
Cleveland No. 1 foundry	4	15				21.19	
Cleveland No. 3 foundry	4	7	&	£4	8s.*	19.40 &	$19.62*
Cleveland No. 4 foundry	4	5	to	4	7	18.96 to	19.40
Cleveland No. 4 forge	4	2½	to	4	5	18.60 to	18.96
Cleveland basic	4	0				17.84	
East Coast mixed	4	10	&	4	10½*	20.07 &	20.18*
Ferromanganese	15	0				66.90	
Ferromanganese*	14	10	to	14	15	64.67 to	65.79
Rails, 60 lb. and up	7	15	to	9	0	34.57 to	40.14
Billets	7	0	to	8	0	31.22 to	35.68
Sheet and tin plate bars. Welsh	7	7½				32.89	
Tin plates, base box	0	19⅛	to	0	19½	4.27 to	4.35
						C. per Lb.	
Ship plates	9	0	to	9	10	1.79 to	1.89
Boiler plates	11	10	to	12	10	2.29 to	2.49
Tees	9	5	to	10	5	1.84 to	2.04
Channels	8	10	to	9	10	1.69 to	1.89
Beams	8	5	to	9	5	1.64 to	1.84
Round bars, ¾ to 3 in.	9	5	to	10	0	1.84 to	1.99
Galvanized sheets, 24 g.	16	5	to	16	10	3.24 to	3.29
Black sheets	12	0				2.39	
Steel hoops	12	0	&	12	5*	2.39 &	2.44*
Cold rolled steel strip, 20 g.	23	2½				4.60	
Cotton ties, Indian specifications	15	0				2.99	

*Export price.

Continental Prices, All F. O. B. Channel Ports, Delivery as Specified

No. 3 foundry pig iron:							
Belgium, September	£4	2½s.				$18.40	
Luxemburg, Sept.	4	0				17.84	
France, September	4	2½				18.40	
Billets:							
France	5	15				25.65	
Luxemburg	6	5				27.88	
Lorraine	6	5				27.88	
Wire nails (keg basis):							
Germany, August	0	14½				3.23	
Belgium	0	20½				4.57	
Wire rods, 5 mm. (0.2 in.):							
Belgium	7	5	to	£10	7½s.	32.34 to	$46.28
						C. per Lb.	
Angles:							
Belgium, September	7	7½				1.47	
Tees:							
Belgium	8	5				1.64	
Merchant bars:							
Belgium, October	7	7½	to	7	15	1.47 to	1.54
Luxemb'g, October	7	7½	to	7	15	1.47 to	1.54
Germany, October	7	15	to	7	17½	1.54 to	1.57
France, October	7	7½	to	7	15	1.47 to	1.54
Channels:							
Belgium	7	10	to	7	12½	1.49 to	1.52
Joists (beams):							
France, Sept., Oct.	7	0	to	7	5	1.39 to	1.44
Belgium, Sept., Oct.	7	0	to	7	5	1.39 to	1.44
Luxemb'g, Sept., Oct.	7	0	to	7	5	1.39 to	1.44
¼-in. plates:							
Germany, Sept.	8	0	to	8	5	1.59 to	1.64
Belgium, Sept.	7	17½	to	8	0	1.57 to	1.59
Luxemburg and France, not offered.							
⅛-in. plates:							
Germany	9	0				1.79	
No. 8 gage wire:							
Belgium, August	14	10⅝				2.89	

New Labor Troubles Threatened—Markets Quiet and Easy—Better Export Prospects

LONDON, ENGLAND, July 27.—A further labor crisis has arisen which seems likely to seriously retard the long-looked-for revival in iron and steel in this country. At the end of the three months lockout of the engineers last month, a conference was held, when the employers proposed to introduce wage reductions amounting to 16s 6d in three instalments. A ballot has now been taken on these terms, and in a total poll of nearly 115,000, a majority of nearly 27,000 have declared for refusal of acceptance. What will be the actual result, however, is not quite clear at the moment, but it is certainly interesting to note that, of the total membership, only about 8 per cent returned votes at all.

In the meantime business in both pig iron and manufactured iron and steel has been quiet. Of course the holiday periods both in the North of England and in Scotland are partly responsible, but there seems to be a general opinion among consumers that, if they wait long enough, they will be able to place all their future requirements at considerably below to-day's prices. The freeing of Cleveland pig iron from minimum fixed selling prices has resulted in a drop in this material of about 2s a ton, while substantial business could doubtless be placed for still less money. There are quite plentiful supplies of No. 3 foundry, but the stock of No. 1 is scarce, and sellers hold firmly to the old price of 95s. It is hoped that America will buy again if the labor troubles continue in that country, but at the present time such purchases are confined to ferromanganese and special irons.

In finished iron and steel business does not improve, and, as a result, though prices generally are quotably unchanged, suitable specifications can be placed at less money. Export buying is quiet, but there are signs that demand from such sources is looking up, and hopes are being entertained of some good business with India before long. Continental competition is again being felt, not only for export but also with the home trade here, and though home trade prices on this side have been subject to a fixed agreement for a long time, instances have been found recently where makers have been allowed to make their own quotations to get the business which is badly needed. Consequently it is thought in many quarters that the only natural result is that this price fixing should be definitely abandoned.

PERSONAL

Carmi A. Thompson, Republican nominee for governor of Ohio, has been identified with the iron business since 1913. He was born in Wayne County, W. Va., Sept. 4, 1870, and his first work was that of a coal miner. He graduated from Ohio State University in 1892, was admitted to the bar in 1895, and later filled the following positions: member of the House of Representatives of Ohio, 1904 to 1907; Secretary of State of Ohio, 1907 to 1911; secretary to President Taft, July 1, 1912, to Nov. 20, 1912; treasurer of the United States, Nov. 20, 1912 to April 1, 1913. Mr. Thompson then became associated with James J. Hill as general manager of the Great Northern Iron Ore Properties and continued in that position until Oct. 1, 1917. He was president of the Cottonwood Coal Co. and South Butte Mining Co. of St. Paul from 1913 to 1917, when he resigned his positions in St. Paul and became associated with the Tod-Stambaugh Co., Cleveland becoming financially interested in that company and taking an active interest in its affairs as vice-president, which position he now holds. He is also chairman of the board of directors of the Marting Iron & Steel Co., Ironton, Ohio, in which the Tod-Stambaugh Co. is financially interested.

CARMI A. THOMPSON

A. R. Gould, a director and general manager of the St. Louis Malleable Casting Co., St. Louis, has resigned to become vice-president Malleable Iron Range Co., Beaver Dam, Wis. He will be associated in the active management with F. W. Rogers, president and general manager.

Henry Harnischfeger, president Pawling & Harnischfeger Co., Milwaukee, has returned from a business and recreation tour of the Far East, lasting six months. He visited Japan, China, the Philippines, India and other foreign countries with the primary object of investigating business conditions and possibilities with special reference to gasoline-driven excavating units manufactured. He witnessed the operation of one of the large type of excavators on the Imperial Japanese Railways by the Musashi Engineering Corporation. Mr. Harnischfeger said that, contrary to the general opinion, there is a growing market in the Far East for labor-saving machinery of all kinds.

Clark M. Osterheld, assistant general superintendent Stoughton Wagon Co., Stoughton, Wis., in charge of the motor truck manufacturing department, resigned Aug. 15 to assume active duty as president and general manager of the Stoughton Mfg. Corporation, which with associates he incorporated recently to engage in the manufacture of electric water heaters and other electrical devices of his design.

H. E. Collins of Rogers, Brown & Co., Boston, has resigned, effective Sept. 1, to accept a position with the Harry M. Hope Engineering Co., Boston. He formerly was associated with this engineering firm.

C. O. Rowe has been appointed manager of the steel department of Carson & Co., Pennsylvania Building, Philadelphia, broker in pig iron, steel, coal, coke, etc.

A. G. Bolenbaugh has resigned from the engineering department of the Truscon Steel Co., Youngstown, Ohio, to accept a position with the United Erecting Co., Los Angeles, Cal., effective Sept. 1.

Harold L. Stevens, who has been appointed general sales manager of Central Iron & Steel Co., Harrisburg, Pa., has spent practically his entire life in the steel business. He was employed in the Sweet mills at Syracuse, N. Y., and later by the Sweet's Steel Co., Williamsport, Pa. Some years later he joined the Lackawanna Steel Co., in the Buffalo sales department. He was made New England district sales manager of the Lackawanna Steel Co. about eleven years ago, with headquarters in Boston. A native of Portland, Me., he attended Cornell University and is an ex-president of the Cornell Club of New England. The change takes effect Sept. 1.

W. C. Robbins, for the past two and a half years general manager of the Eberhart Steel Products Co., Inc., Buffalo, is no longer with that company but is carrying on consulting and manufacturing work in the same city.

W. H. White, formerly connected with the United States Naval Ordnance plant, Charleston, W. Va., has been appointed superintendent of the open-hearth department Pittsburgh Crucible Steel Co., Midland, Pa., succeeding L. A. Lambing, resigned.

E. W. Rossiter has been appointed engineer of construction for Freyn, Brassert & Co. He was previously chief engineer of the Interstate Iron & Steel Co., Calumet River, Chicago, and prior to that was with the American Sheet & Tin Plate Co., the Minnesota Steel Co., and the Canadian Steel Corporation, Ltd., Ojibway, Ont.

E. L. Ford is president of the Youngstown Steel Co., Youngstown, Ohio, which is installing a mechanical puddling plant at Warren, Ohio. Mr. Ford is a son-in-law of Joseph G. Butler, Jr., Youngstown, and has been associated for many years with the development of the iron and steel industry of the Mahoning Valley. Mr. Ford is a director of the Youngstown Sheet & Tube Co. and a member of the executive committee of the Brier Hill Steel Co. The mechanical puddling machine to be used in the Warren installation is the result of years of experimentation by Mr. Ford and associates. It is modeled after a design by Mr. Ford, fully covered by patents. Plans provide for an extensive plant to consist of two blast furnaces, by-product coke oven complement and 16 mechanical puddling machines.

E. L. FORD

LeRoy Richards, for several years connected with the sales department of the Alan Wood Iron & Steel Co., Philadelphia, on Sept. 1 will become associated with A. B. Ambler, Pacific Coast representative of the same company, San Francisco. Mr. Richards will locate in Los Angeles, where he will be resident sales representative, with offices in the Higgins Building.

Paul H. Diver, who for four years has been sales representative of the Ohio Electric & Controller Co., Cleveland, has been appointed manager of sales.

C. J. Pagel, who has been associated with the Robbins & Myers Co. in the Cleveland district, has been appointed sales representative of the Ohio Electric & Controller Co., Cleveland, effective Sept. 1.

Charles E. Hulick, superintendent of blast furnaces of the Thomas Iron Co., Hokendauqua, Pa., has resigned, effective Sept. 1.

H. G. Naylor, formerly with the United States Radiator Corporation at Corry, Pa., has been appointed manager of the Niagara Radiator & Boiler Co. plant at Chicago.

Capt. Robert W. Hunt, Robert W. Hunt & Co., engineers, specializing in rail inspection, Chicago, has

Joseph G. Butler, Jr., at Home

A VISIT to the venerable manufacturer in Youngstown and to the McKinley Birthplace Memorial at Niles, Ohio.

(*Editorial Correspondence*)

YOUNGSTOWN, Aug. 10.—It was my privilege to-day to come to this busy capital of the Mahoning Valley to pay my respects to its First Citizen, Joseph G. Butler, Jr., the grand old man of the iron industry. Mr. Butler, now in his 84th year, sits in his big, comfortable chair —comfortable as any chair could be for one who suffers as he does. For more than two years Mr. Butler, as a result of being struck by an automobile after returning from the funeral of Henry C. Frick, has been unable to walk without assistance and at times the pain which he heroically endures is very severe. Although Mr. Butler admitted to-day that those dreadful pains were troubling him, there was nothing to indicate that fact as he most cordially received his visitors and talked of the past, present and future.

Emphasis should be placed on the present and future rather than on the past, for, while Mr. Butler delights in talking over the early days of iron making and politics, his thoughts are largely on the problems of to-day and of his plans for writing a new book and enlarging the beautiful art gallery, across the street from his home, which he had erected for the people of Youngstown. He is constantly adding to the art treasures and has in mind important enlargements of the building.

The large room in which Mr. Butler now spends so many of his hours overlooks an extensive lawn, made beautiful by the rich green of the grass and the choice flowers of many colors. The walls are lined with books and almost hidden by pictures. Everything has some historic interest, recalling the progress of the iron industry, stirring days of politics from the time of Lincoln to Harding, or delightful journeys to many parts of this country and Europe. Inscriptions on photographs, particularly that of President Harding, written the night he received the news that he would be the next occupant of the White House, show gratitude and affection. A year or so ago a part of the Butler home was destroyed by fire. Numerous paintings and other treasures were burned. One, a photograph of the King of Belgium, with whom Mr. Butler became well acquainted while visiting Brussels with other steel manufacturers a few years ago, has been graciously replaced by his majesty.

Mr. Butler's visitors include from time to time some of the most distinguished men in the United States. Charles M. Schwab never misses an opportunity to drop in on "Uncle Joe." Justice John H. Clarke of the United States Supreme Court is a resident of Youngstown and while spending his vacation at home, is a frequent caller upon Mr. Butler.

After reluctantly bidding Mr. Butler good-bye, I was driven past the homes of countless happy, prosperous mill workers to Niles, the birthplace of William McKinley, and visited the McKinley Memorial at Niles, which is indeed a monument to Mr. Butler, who conceived the idea and with untiring energy worked in carrying it out, as well as to Ohio's second martyr President, whose life was so closely connected with the prosperity of the iron industry, especially the tin plate industry, established through the McKinley law, despite all the ridicule that was heaped upon the author. Although I had heard much about the memorial, it was far beyond my expectations. The great beauty of the marble structure is a pleasant surprise to one who had gotten his idea of it from the photographs, which do not do it justice. The heroic statue of McKinley is, of course, the center of attraction and is a real work of art, as indeed are almost every one of the bronze busts of leaders of industry and statesmanship —Taft, Roosevelt, Root, Harding, Gary, Farrell and others. The relic room chains the attention and the library wins the admiration of all, while the assembly room is a most important feature.

One can hardly resist regretting that this memorial was not erected in a greater center of population, where a much larger number of people would be able to see it and be impressed by it, but after all the relatively few who do visit it go there from many parts of this country because it has a genuine attraction for them and the citizens of the Mahoning Valley, to whom it is most easily accessible, are not satiated by sightseeing and are more deeply impressed than would be the citizens of a large city. "Uncle Joe" was right. Niles is the proper place for the McKinley Memorial.

G. S.

recovered from a severe illness which confined him to his home and has resumed his duties at the office of the company. Captain Hunt is in his eighty-fourth year.

Joseph Edmonds, formerly superintendent structural mill finishing ends, Illinois Steel Co., South Chicago, was recently appointed superintendent of finishing mills, No. 2 plant, Inland Steel Co., Indiana Harbor, Ind.

Morris W. Lee, formerly vice-president, Frank D. Chase, Inc., Chicago, has established an advertising agency at 220 South Michigan Avenue, Chicago.

Obituary

WILLIAM G. FLAIG, sales representative specializing in railroad work, Niles-Bement-Pond Co., at Chicago, died suddenly in that city on August 11, at the age of 43.

VALENTINE B. CHAMBERLAIN, JR., mill superintendent Stanley Works, New Britain, Conn., died suddenly Aug. 5, at Oak Bluffs, Mass. Mr. Chamberlain was born in New Britain thirty-six years ago.

CHARLES GRAY COOPER, whose death on Aug. 4 after an illness dating from April, 1918, was mentioned in this column last week, was for forty-five years identified with the C. & G. Cooper Co., engine builder, Mt. Vernon, Ohio. He was born in Mt. Vernon Dec. 11, 1845, and was the son of Elias Cooper, who, with his brother Charles Cooper, founded Cooper company 90 years ago. He was educated in the public schools of Mt. Vernon and at Oberlin College. He served in the Civil War and became connected with the Cooper company in 1866, at which time it was a partnership. At its incorporation in 1898, he became secretary and served in this capacity until the death of the president, F. L. Fairchild, in 1912, when he was made president. He served as president until his illness in 1918, when B. B. Williams was made president and Mr. Cooper became chairman of the board of directors. Mr. Cooper was one of the pioneer engine builders of this country and practically his entire life was spent in the developing and building of Cooper steam and gas engines. He was a member of the Masonic bodies of Mt. Vernon and for many years an officer of the Congregational Church. The members of his immediate family who survive him are a widow, two daughters and a son.

WILLIAM C. PEARSON, senior member of D. G. Gautier & Co., iron and steel jobbers, 50 Church Street, New York, died at his home on Saturday, Aug. 12

Machinery Markets and News of the Works

STRIKES AFFECT TOOL TRADE

August Business Not Up to That of July, but Prospects Are Good

Rising Costs of Manufacture Disturbing to Machinery Manufacturers Who Consider Advances

The fact that August sales of machine tools are not up to the July record is attributed solely to the uncertain conditions which have arisen because of the continuation of the coal miners' and railroad shop mechanics' strikes. A considerable volume of business is pending, which it is expected will be released when a settlement of the strikes has made the outlook clearer.

Railroads which have recently made known their machine-tool requirements are taking no action and are not expected to do so until their labor troubles are over. There has been some small buying by a few roads, but the large lists of the New York Central, Illinois Central and other roads are dormant.

Industrial companies are also losing interest in new equipment, as fuel shortage threatens their operations. Some plants have already reduced their working forces or the number of working hours, while a few are at the point of being shut down because of inability to get coal. The General Electric Co., Schenectady, N. Y., is getting prices on a large number of tools preparatory to issuing a formal inquiry, this being the largest new prospect in the market.

It is expected that the Milwaukee Sewerage Commission will be in the market in about two or three months for machine tools and other equipment for a shop to be erected on Jones Island. The Lima Corporation, Lima, Ohio, will require a number of tools, but the list has not as yet been issued.

Machine-tool builders are becoming more disturbed over rising costs of manufacture. Pig iron, steel and labor costs are all on the upturn, and with a low rate of operations the overhead charges on new machine tools, it is stated, not only make any further general reductions out of the question but are causing manufacturers to study seriously the question of putting into effect advances which will cover their higher costs. In all probability these advances will come in the fall.

New York

NEW YORK, Aug. 15.

THE machine-tool trade has its attention focused largely on the termination of the coal and railroad strikes in the belief that the present business uncertainty will continue as long as these strikes remain unsettled. While some in the trade enjoyed a fairly good July business there is no indication thus far that August will keep pace. Yet prospects are encouraging for better business as soon as the industrial situation has become clarified. The General Electric Co., Schenectady, N. Y., has asked for preliminary prices on a large number of machine tools, these prices, it is stated, to be used as a basis for preparing a machine-tool budget to cover a formal list which will be issued soon. This is the outstanding development of the week as regards future business.

Railroads are buying in a small way, the larger purchases that were expected being postponed until the shop mechanics' strike is ended. The Chesapeake & Ohio Railroad has bought a 42-in. boring and turning mill and a 1100-lb. hammer; the Texas & Mexican Railroad has ordered a 79-in. driving wheel lathe from a New York company, and the Denver Tramways have ordered a 42-in. car-wheel borer.

The crane market has been quiet the past week, few new inquiries having appeared and but few awards being reported. The 10-ton, 44-ft. span overhead traveling crane inquired for recently by the American Car & Foundry Co. has been postponed. Other small inquiries which have been in the market for some time are reported to have been postponed.

The sale of 36 locomotive cranes at Boston on Aug. 9, by the Navy Department, resulted in high bids being submitted on the various lots by the General Equipment Co., New York; Thomas F. Carey, 120 Liberty Street, New York; the Potomac Power Co., Hagerstown, Md.; B. M. Weiss, Philadelphia, and Philip T. King, 30 Church Street, New York. The cranes, which will probably be awarded to these high bidders, consist of ten 15-ton and one 10-ton, Brownhoists; a 25-ton and 20-ton Brownings; one 15-ton American; four 5-ton and one 10-ton Osgoods; two 20-ton, two 15-ton and one 22-ton Orton & Steinbrenner cranes; four 15-ton and one 10-ton Industrials; one 30-ton Ohio, 20-ton Linkbelt, 12-ton McMyler-Interstate, 15-ton Bucyrus, 15-ton Browning Engine Co. and a 7-ton Victor R. Browning.

Among recent purchases are:

American Car & Foundry Co., New York, a 15-ton locomotive crane from the Orton & Steinbrenner Co.

Southern Pacific Co., 165 Broadway, New York, a 25-ton locomotive crane with bucket from the Ohio Locomotive Crane Co.

General Electric Co., for Atlanta, Ga., a 10-ton, 22-ft. 6-in. span overhead traveling crane from the Northern Engineering Works.

Bethlehem Steel Co., Bethlehem, Pa., a 10-ton, 40-ft. span overhead traveling crane from the Northern Engineering Works.

Utica Heater Co., Utica, N. Y., a 5-ton, 35-ft. span overhead traveling crane from the Niles-Bement-Pond Co.

Warner Sugar Refining Co., New York, a 10-ton overhead traveling crane, for use in Cuba, from the Reading Chain & Block Corporation.

Johns-Manville Co., Inc., New York, two industrial trucks for Waukegan, Ill., from the Towmotor Co., Cleveland.

Valabhas Runchordas & Co., 70 Apollo Street, Bombay, India, have written to THE IRON AGE stating that they are in the market for the following equipment and desire to buy against cash in New York: Dynamo for copper plating and nickel plating; complete installation for copper and nickel plating; oil engines, steam engines, small boiler, electric motors, lathes, milling machines, band saws, planers and tools for small work shop; complete machinery for the manufacture of phonograph horns and toys; machinery for manufacturing phonograph and sewing needles on small scale; complete machinery for making phonograph records; wood-working machines for phonograph cabinets; also other equipment for a complete phonograph manufacturing plant. Specifications may be examined at the New York office of THE IRON AGE or information will be given by mail.

A one-story power house and refrigerating plant will be erected at the new candy factory to be built by Ridley's, Inc., 345 West Fortieth Street, New York, at Long Island City, estimated to cost in excess of $100,000. W. Kenneth Watkins, company address, is architect.

The Board of Education, Saratoga Springs, N. Y., is arranging a list of equipment for installation in the machine shop and vocational department of its new high school.

The Egyptian Lacquer Mfg. Co., 5 East Fortieth Street, New York, is taking bids for a one-story building, 50 x 100 ft., on Maple Avenue, Los Angeles, for a Pacific Coast works. Mott M. Marston, 533 San Fernando Building, Los Angeles, is architect.

Parker Axles, Inc., 1819 Broadway, New York, manufacturer of automobile axles, with plant at Poughkeepsie, N. Y., has tentative plans for a new factory at York, Pa.

An automobile service and repair works for company trucks will be constructed by the Holland Laundry Co., 373 President Street, Brooklyn, on Twenty-fifth Street, in connection with a new three-story plant building.

The Superior Aluminum Corporation, 175 Fifth Avenue, New York, has leased floors in the building at 132 Bleecker Street for local works.

Jacob Roth, New York, has leased the building at the northwest corner of Ninth Avenue and 209th Street for the operation of an automobile service and repair works. Immediate possession will be taken.

The American Lamp Co., 25 West Forty-third Street, New York, organized with a capital of $2,000,000 to manufacture incandescent and electric lamps, is concluding the purchase of the former plant of the New England Products Co., Stamford, Conn., manufacturer of kindred specialties, now in receivership. The company is also planning the establishment of branch plants at Newark, N. J.; Philadelphia, Detroit, Chicago and New Orleans. It is proposed to operate one of the largest works at Long Island City where a site will be selected. William H. Young is president, and Walter L. Tremper, vice-president and treasurer.

Charles R. Barnes, 246 Washington Avenue, Albany, N. Y., has awarded a contract to the William G. Sheehan Building Co., 28 DeWitt Street, for a one-story automobile service and repair works, 65 x 165 ft., on Central Avenue, to cost about $85,000.

Material-handling machinery, etc., will be installed in the new warehouse to be erected by the Republic Storage Co., 541 West Thirty-fourth Street, New York, estimated to cost about $200,000. Russell G. Cory, 30 Church Street, is architect and engineer.

The Tidal Oil Co., 11 Broadway, New York, a subsidiary of the Tide Water Oil Co., same address, operating oil refineries and gasoline plants in Oklahoma and Kansas, has received an appropriation of $1,000,000, from the parent company, to be used for extensions and improvements. The bulk of the fund will be used for oil refinery additions, including new equipment.

The Electric Supply & Equipment Co., Hartford, Conn., will take bids at once for a new four-story building, 40 x 60 ft., at Broadway and Church Street, Albany, N. Y., for branch works. It will cost about $50,000.

The State Highway Department, 8 Elizabeth Street, Utica, N. Y., L. D. Brownell, division engineer, will commence the erection of a one-story machine shop, 45 x 210 ft., with storage department for road machinery and equipment.

A vocational department will be installed in the new high school, 53 x 170 ft., to be erected at Greenburgh, N. Y. Jallade, Lindsay & Warren, 129 Lexington Avenue, New York, are architects.

Francis J. Sheridan, New York, has leased the four-story and basement building at 147-51 West Eighty-third Street, for an automobile service and repair works.

A vocational department will be installed in the new high school, 160 x 200 ft., to be erected at East Hampton, L. I., estimated to cost in excess of $150,000. A. F. Gilbert, 80 Maiden Lane, New York, is architect.

The West India Sugar Finance Corporation, 129 Front Street, New York, operating plants in the West Indies, is arranging for an increase of $835,000 in its preferred stock, the proceeds to be used for extensions and improvements, including the consolidation of other sugar refining properties in the same district.

Hoisting equipment, conveyors, loading and unloading machinery, etc., will be installed in the new distributing and storage plant to be constructed at Roosevelt, N. J., by Ichabod T. Williams & Sons, Eleventh Avenue and Twenty-fifth Street, New York, lumber merchants. Waterfront property totaling 69 acres has been acquired from the Bethlehem Shipbuilding Corporation, heretofore used in connection with the Moore shipbuilding plant. The lumber terminal will occupy the entire site.

A vocational department will be installed in the two-story and basement high school, 60 x 195 ft., to be erected at Bridgeton, N. J., for which foundations are now being laid. It will cost about $200,000. Ritter & Shay, North American Building, Philadelphia, are architects.

An electrically operated pumping plant and industrial railroad will be constructed in connection with the new sewerage disposal plant to be built by the Hackensack Improvement Commission, Hackensack, N. J., to cost about $481,000. A general contract for the project has been let to the Public Service Production Co., Public Service Terminal, Newark, N. J.

Robert O. Beebe, director Essex County Vocational Schools, 316 Essex Building, Newark, will lease a building in the Watsessing district, Bloomfield, N. J., for the establishment of a Boys' Continuation School. The initial shop space will approximate 4000 sq. ft. In connection with the new Seymour Vocational School, Sussex Avenue and First Street, Newark, which will be ready for occupancy in September, a number of departments will be omitted from immediate service and equipped later; one of these will be the foundry and another, the steam fitting department.

The Durant Motors, Inc., 1819 Broadway, New York, is arranging to transfer different features of production from the Long Island City plant to the new works at Elizabeth, N. J., as soon as the latter plant is ready for service, about the middle of September. The Long Island City works will then be arranged to manufacture a limited number of Flint automobiles for the Flint Motor Co., a recently organized subsidiary. The machinery installation at the new Elizabeth works will require several months for entire completion.

An electrically operated pumping plant will be installed by the Township Committee, Cove and Centre streets, Pensauken, N. J., in connection with a new sewerage system. Remington & Vosbury, 601 Market Street, Camden, N. J., are engineers.

Chicago

CHICAGO, Aug. 14.

THE machine-tool market has become exceedingly quiet, inquiries having disappeared almost entirely and others having dropped to the vanishing point. The railroads are taking no action on their inquiries and industrial plants are losing interest in new equipment as the fuel shortage threatens operations. In a number of instances local machinery houses have received reports that certain plants have reduced operations because of lack of coal and some of them, in fact, are at the point of closing down entirely. The Continental Motors Co., Muskegon, Mich., has added a boring mill and a large special manufacturing grinding machine to its recent list of purchases. This order is one of a very few which are reported in the local market.

The Pullman Co., Pullman, Ill., has ordered a railroad coach hoist from the Whiting Corporation, Harvey, Ill.

The E-K Mfg. Co., 31 North State Street, Chicago, recently incorporated with $60,000 capital stock, will manufacture electric soldering machines for jewelers, opticians and dentists, and has leased a plant at 1775 Ogden Avenue. Very few metal-working machines will be used as most of the parts are to be manufactured outside. A steel cutting shear is the only machine used at present. The officers are P. N. Nelson, president; D. C. Spencer, vice-president and secretary; L. S. Nelson, treasurer.

The West Woodworking Co., 304-08 North Ada Street, Chicago, has let contract for a one-story factory to cost $16,000.

The Duffin Iron Works, 4843-55 South Kedzie Avenue, Chicago, has let contract for a one-story addition, 40 x 65 ft., to cost $10,000.

The Manufacturers Terminal Co., Waukegan, Ill., has had plans prepared by Fox & Fox, architects, 38 South Dearborn Street, Chicago, for remodeling a three and five-story factory, 43 x 62 ft., and for providing a small addition.

A contract has been awarded by George S. Kingsley, 109 North Dearborn Street, for a one-story garage, 100 x 125 ft., at 916-22 Madison Street, Oak Park, Ill., for A. Y. Lucal, to cost $25,000.

The Schuessler Foundry Co., Alton, Ill., has let contract

for a new foundry, 120 x 230 ft., around which are to be constructed a number of smaller buildings.

The Sloan Valve Co., 4300 West Lake Street, Chicago, will build a one-story plant, 39 x 142 ft., to cost $10,000.

The McDonald Loose Leaf Co., 638 Federal Street, Chicago, has let contract for a one-story factory, 95 x 125 ft., at 1809-17 Summerdale Avenue, to cost $30,000.

The report that the Ford Motor Co. has purchased a site in the Calumet industrial district of Chicago has been confirmed. A tract of 80 acres has been purchased from the Calumet & Chicago Canal & Dock Co. The property is southeast of the Calumet River and west of Torrence Avenue, running south to the South Shore Railroad at about 130th Street. An assembling plant will be erected.

The McKelvey Pulverizing Co., 136 West Lake Street, Chicago, recently incorporated, will grind or pulverize pigments by a new method, using the McKelvey patent machine for pulverizing by compressed air. The company has equipped a plant at Utica, Ill., formerly occupied by the Black Ball Cement Co. Its work for a time will be of an experimental nature and it will not manufacture any machinery at present outside of the initial McKelvey machine which is now completed. The officers are H. V. Gressang, president; David McKelvey, general manager, and J. Neuburger, secretary and treasurer.

The Public Service Co. of Northern Illinois will commence the construction of a new generating station at Waukegan, Ill. about Sept. 1. The first unit will contain a 20,000-kw. turbine, a condenser and three boilers of 1430 hp. each. Plans provide for an ultimate layout comprising eight turbine units, developing 250,000-kw. A tract of 80 acres adjoining Waukegan will be occupied by the plant.

The American Foundry & Furnace Co., manufacturer of furnaces and boilers, Bloomington, Ill., is building an addition.

The Bowman Dairy Co., 140 West Ontario Street, Chicago, will build a new one-story machine shop, 45 x 90 ft., at its plant at Harvard, Ill.

Fred Riebel & Co., 6221 Wentworth Avenue, Chicago, manufacturer of sheet iron and metal products, is said to be planning the installation of machinery to manufacture metal cans and containers.

A vocational department will be installed in the new three-story high school, 150 x 250 ft., with one-story extension, 40 x 90 ft., to be erected at St. Paul, Minn., estimated to cost about $325,000, for which revised bids will be called. F. X. Lewes is city architect.

The Northwestern States Portland Cement Co., Mason City, Iowa, will commence the immediate erection of a new one-story machine shop.

The United States Government, Post Office Department, Washington, has tentative plans under consideration for new works in the vicinity of Maywood, Ill., to manufacture aeroplanes and parts, primarily for mail service. The plant is estimated to cost in excess of $500,000.

The Advance Rumely Co., Laporte, Ind., manufacturer of agricultural machinery, etc., is taking bids for a two-story and basement building, 100 x 132 ft., at Ninth and Farnam streets, Omaha, Neb., for a factory and distributing branch, estimated to cost about $200,000, including equipment. John Latenser & Sons, 732 Peters Trust Building, Omaha, are architects.

The Chicago, Burlington & Quincy Railroad Co., Omaha, Neb., will commence the construction of a new electric power plant at Plattsmouth, Neb., to cost about $50,000.

W. F. Bleck & Co., 1846 Lamon Avenue, Chicago, is taking bids for a one and two-story and basement addition to its sash and door manufacturing plant, 180 x 200 ft., to cost about $100,000, including machinery. H. H. Green, 304 South Wabash Avenue, is architect.

The Commonwealth Edison Co., Chicago, has awarded a general contract to the George A. Fuller Co., 140 South Dearborn Street, for a new electric generating plant at 100th Street and the Calumet River, six-stories, 120 x 280 ft., estimated to cost $1,000,000.

The St. Paul Casket Co., 227 West Seventh Street, St. Paul, Minn., is completing plans for a new four-story plant, 95 x 150 ft., at Griggs and University avenues, estimated to cost about $140,000, including machinery. A. H. Stein, 601 Endicott Building, is architect. Ernest C. Reiff is president.

The Pullman Co., 79 East Adams Street, Chicago, is planning for enlargements in its automobile body manufacturing works. Up to the present time manufacture to a large extent has been limited to bodies for the Packard Motor Co., Detroit.

The Universal Office Devices Co., Inc., 56 East Superior Street, Chicago, desires to get in touch with companies equipped to manufacture a sheet metal part about 0.025 in. thick and 3 in. long by 1⅝ in. wide, with a ⅜-in. flange, and having two slots cut lengthwise 2⅝ in. by ⅛ in. wide. Parts made from wire about 0.125 in. thick, bent in horseshoe form, 2⅝ in. long and 1⅜ in. between legs, and notched on each leg, are also required.

Philadelphia

PHILADELPHIA, Aug. 14.

THE Jones Machine Works, Inc., Fifty-third Street and Lansdowne Avenue, Philadelphia, manufacturer of machinery and tools, will break ground at once for a new plant on property recently acquired at Primos, Pa., to include a machine shop, foundry, pattern shop and minor structures. The erection of the foundry will be deferred for several months.

The Logan Ice Mfg. Co., Tenth Street and Windrim Avenue, Philadelphia, has plans in progress for four one-story buildings to comprise a new plant. J. T. Hockstra, 1713 Sansom Street, is architect. C. W. Roberts is president.

A one-story power house, with cooling tower and other auxiliaries, will be constructed by the Philadelphia Brewing Co., Philadelphia, at Fairhill and Clearfield streets.

The Corrugated Container Co., Trenton and Venango streets, Philadelphia, will install new cutting and creasing machinery at its plant.

The F. W. Hosbach Cabinet Works, 2415 South Street, Philadelphia, will build a new two-story plant, 65 x 76 ft., at Twelfth and Brown streets.

The George W. Blabon Co., Twenty-first Street and Hunting Park Avenue, Philadelphia, will install additional tools and equipment in the machine shop at its linoleum plant.

The Northeastern Ice Mfg. Co., Front and Luray streets, Philadelphia, has awarded contract to E. R. Hall, 34 South Seventeenth Street, for a new building to cost $50,000.

The Philadelphia Rapid Transit Co., 810 Dauphin Street, Philadelphia, has arranged for a bond issue of $2,150,000, a portion of the proceeds to be used for extensions and improvements, including power houses and equipment. W. C. Dunbar is vice-president.

The Hurley Motor Co., 219 North Broad Street, Philadelphia, has awarded contract to Cramp & Co., Denckla Building, for a new two-story service and repair building, 100 x 204 ft., at Thirty-first and Thompson streets, estimated to cost in excess of $100,000. J. Scott Hurley is president.

A one-story automobile service and repair works, 90 x 105 ft., for company trucks and automobiles, with department for wagon work, will be constructed by the Breyer-Sharpless Milk Co., Ninth and Cumberland streets, Philadelphia. In connection with a new dairy building the structure will cost about $100,000.

The William Cramp & Sons Ship & Engine Building Co. Richmond & Norris streets, Philadelphia, is reported to be planning for enlargements in the drydocks, including the addition of shop and repair facilities.

Charles B. Warren, superintendent of purchases, Board of Education, 9 South Stockton Street, Trenton, N. J., will receive bids until Aug. 18 for manual training supplies needed at the public schools during the coming school year, as per specifications on file.

The Coatesville Boiler Works, Coatesville, Pa., is disposing of a bond issue of $300,000, a portion of the proceeds to be used for the purchase of additional equipment.

The Excelsior Coal Co., West Excelsior, Pa., has authorized the immediate preparation of plans for rebuilding its anthracite coal washery, recently destroyed by fire. A list of equipment is being arranged.

The Board of Education, Herrick Center, Pa., is planning for the early purchase of equipment for installation in the vocational department at the local high school. G. B. Giles is secretary.

The Reading Hardware Co., Sixth and Willow streets, Reading, Pa., has plans in progress for a new power house, 50 x 96 ft., to be used in connection with a seven-story addition. George Gerhard & Sons, 619 Penn Street, are architects.

The Stallum Metals Co., Temple, Pa., recently organized to manufacture special metal products, will commence the erection of a new one-story foundry and machine shop, estimated to cost in excess of $150,000, including equipment. S. S. Staley heads the company.

A vocational department will be installed in the proposed high school to be constructed in the Allison Hill district, Harrisburg, Pa., estimated to cost in excess of $250,000. A site is being selected and plans will be prepared at an early date.

The York Mfg. Co., York, Pa., manufacturer of ice-making and refrigerating machinery, has plans under consideration for a new five-story building at its plant, 60 x 100 ft., estimated to cost in excess of $300,000.

The Boyertown Burial Casket Co., East Greenville, Pa., is planning for the erection of an electric light and power plant for works service.

A vocational department will be installed in the new two-story high school, 90 x 180 ft., to be erected at Jenkintown, Pa., for which revised plans are being drawn. It is estimated to cost about $225,000. Heacock & Hokanson, 1218 Chestnut Street, Philadelphia, are architects.

The Coopersburg Casket Co., Coopersburg, Pa., has construction under way on a new two-story plant.

The Solomon's Radiator Repair Works, Harrisburg, Pa., recently organized, will operate a general sheet-metal works and repair shop at 252 Hamilton Street. M. Solomon is general manager.

A vocational department will be installed in the new two-story junior high school to be erected at Ardmore, Pa., estimated to cost about $540,000, for which foundations will be commenced at an early date. Savery & Scheetz, Stephen Girard Building, Philadelphia, are architects.

A power house will be built by the Worth Chocolate Co., Hershey, Pa., in connection with its new factory at Cleona, Pa. Harvey T. Hauer, 829 Cumberland Street, Lebanon, Pa., is architect. Harry Worth heads the company.

Albert Hanker, New Cumberland, Pa., operating a box factory, has tentative plans for a new one-story plant for the manufacture of a patented window, with lifting and locking devices, etc., for which he has purchased the patents. He is also interested in the erection of a new local automobile body manufacturing works.

Fry Brothers, 310 West Fourth Street, Williamsport, Pa., will commence the erection of a new one-story automobile service and repair works, 125 x 130 ft., on West Fourth Street.

The Audubon Wire Cloth Co., Audubon, N. J., is adding another one-story unit to its plant to take care of growing business. When completed the present floor space will be doubled and will cover an area 145 x 180 ft. Robert F. Korb is president and general manager.

New England

BOSTON, Aug. 14.

UNCERTAINTY of the coal and railroad labor situation continues to restrict business in the New England machine-tool market. A sale of a ½ x 8 in. full automatic lathe, costing about $1,500, to a Rhode Island manufacturer, with a prospect of the firm taking an additional dozen machines, is the most noteworthy development for new tools. The Lawrence, Mass., school list is still pending, the trade being inclined to hold off because of conditions connected with the deal. The list includes 10 12-in. engine lathes, one 16-in. and one 14-in. lathe, a milling machine, planer, drill press, shaper, sensitive drill and other machinery, in addition to considerable wood-working equipment, all motor driven, and a complete blacksmith outfit. A New Bedford, Mass., piston ring maker, who recently purchased four lathes, two with turret attachments, is in the market for additional new tools costing about $5,000. Three or four other sizable inquiries for new tools are out, details being withheld. One of these inquiries is for export. Business in used machine tools has been further restricted by the announcement that the equipment of a Quincy, Mass., shop of fair proportions, will be sold at auction this week.

A Middle West maker of drill presses whose prices were considerably out of line with other drill presses, has made a substantial reduction in prices. New England machine-tool builders are understood to be working on new price schedules, which will show an advance and be announced probably in September or October.

A Worcester machine tool builder has contracted with the Wickwire-Spencer Steel Co. for the building of special machinery, the order being of sufficient size to keep the plant running on its present schedule two months.

The Boston & Maine Railroad Co., Springfield, Mass., has work under way on an addition to works at Holyoke, Mass., which will be used for repairing locomotives. It is proposed to provide a capacity for handling 20 engines at one time.

The Walsh Boiler Works, Holyoke, Mass., has contracted with the Boston & Maine Railroad for a considerable amount of locomotive boiler repair work. No new equipment is required.

The Hoyt Silver Co., 338 Pearl Street, New York, has incorporated to manufacture stainless metal to be used in cutlery at Milford, Conn. Plans call for a factory to give employment to about 300. William T. Hoyt is president.

A vocational department will be installed in the new two-story and basement high school, 66 x 161 ft., to be erected at Shrewsbury, Mass. Chester R. Stacey is superintendent of schools in charge.

The Holyoke Supply Co., 210 Race Street, Holyoke, Mass., manufacturer of pipe, plumbing equipment, etc., has awarded a contract to P. J. Kennedy, 464 Maple Street, for a five-story addition to cost about $50,000.

The Bassick Co., Austin Street, Bridgeport, Conn., manufacturer of casters and hardware specialties, is planning for the installation of a number of machine tools, including lathe, milling machine and drill press.

William H. Hickey, Jr., Dorchester, Mass., has acquired the building at 1233-45 Dorchester Avenue, corner of Hancock Street, and will remodel the structure for an automobile service and repair works. A machine shop will be installed.

A vocational department will be installed in the new three-story high school to be erected at Fall River, Mass., in the North Park district, estimated to cost about $400,000. N. S. Chase, 583 Center Street, is architect.

The Gloucester Electric Co., Gloucester, Mass., has made application for permission to issue capital stock for $91,600, the proceeds to be used for extensions and improvements.

The Boston Ice Co., 262 Heath Street, Boston, will build a new plant to cost about $200,000, including machinery. Plans have been completed.

The Standard Oil Co., 26 Broadway, New York, has surveys under way for its proposed new oil distributing plant at Middletown, Conn., estimated to cost in excess of $500,000 with equipment.

The Deerfield Valley Paper Co., recently organized, has acquired the plant and business of the Monroe Bridge Paper Co., Monroe Bridge, Greenfield, Mass., and will operate the mill in the future. Extensions and improvements are planned.

E. H. Blake, 18 Harvard Avenue, Dorchester, Mass., will commence the erection of a new one-story automobile service and repair building, 100 x 120 ft., on Harvard Avenue. James T. Ball, Trinity Court, Boston, is architect.

The Metropolitan Concrete Block Co., Danbury, Conn., will build a plant and install complete automatic machinery for lowest production cost. Charles Woods is in charge.

The Dasco Spring Cover Co., Allston, Mass., has leased a floor of the Wilcox factory at Athol Highlands, Athol, Mass., for a new works to manufacture spring covers for automobile service.

Baltimore

BALTIMORE, Aug. 14.

J. ROSENBLATT & CO., 32 South Howard Street, Baltimore, desire to hear from companies equipped to cut, stamp and curl flat, decorated tin sheets into trays 13¼ in. square in lots of 10,000. Other stampings wanted are doors 11 x 15 in., from galvanized sheets in quantities of 5000 or more.

The Edro Richardson Brass Co., 318 North Holliday Street, Baltimore, will break ground at once for a one-story addition to its foundry, estimated to cost about $35,000.

The Board of Awards, office of the City Register, City Hall, Baltimore, will take bids until Aug. 23, for machinery in the vocational department of Junior High School No. 47, as per specifications at the office of the Board of School Commissioners, Madison and Lafayette avenues. John H. Roche is secretary of the board.

The Security Cement & Lime Co., Equitable Building, Baltimore, is planning for enlargements in its plant at Hagerstown, Md., to increase the capacity about 50 per cent. New equipment will be installed.

The Charlottesville & Albemarle Railway Co., Charlottesville, Va., will install new electrical and other equipment at its power plant.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until Sept. 5 for one I-beam crane, for the Mare Island Navy Yard, San Francisco.

The Post Office Department, office of the purchasing agent, will receive bids until Aug. 18, for two trip hammers.

The Kneip Motor Car Co., 1017 Eutaw Street, Baltimore, has awarded contract to the Consolidated Engineering Co., Calvert Building, for a two-story service and repair building, 40 x 150 ft. The Franklin Motor Car Co., will occupy

a portion of the structure. Otto C. Simonson, Inc., Maryland Casualty Building, is architect.

A vocational department will be installed in the new one and two-story high school, 80 x 150 ft., to be erected at Smyrna, Del., for which bids are being asked until Sept. 5. The Delaware School Auxiliary Association, du Pont Building, Wilmington, is in charge.

The Metallic Press Cloth Co., Augusta, Ga., is planning for the establishment of a factory to manufacture metallic cloth for oil mill service. William A. Lee is president.

Fleming Aytes, 1006-A Bacon Street, Richmond, Va., is planning for the establishment of a factory to manufacture special automobile parts.

A vocational department will be installed in the new two-story and basement high school, 54 x 100 ft., to be erected at Franklin, Va. W. Newton Deihl, Monroe Building, Norfolk, Va., is architect.

S. J. Schmenner, 1422 Whitelock Street, Baltimore, has filed plans for a two-story automobile service and repair building, 50 x 81 ft., at 2913-37 Walbrook Avenue.

Hugh McRae, Wilmington, N. C., is organizing a company to build and operate several industrial plants in a portion of New Hanover County, including a machine shop, crate manufacturing plant, and basket factory.

The Strickland Machine Shop, 2322 East Main Street, Richmond, Va., is planning for the installation of a new lathe and drill press.

The Consolidated Gas, Electric Light & Power Co., Lexington Building, Baltimore, is planning to rebuild the coal handling tower at its Spring Garden power plant, recently destroyed by fire with loss of about $25,000.

The Atlanta Glass Mfg. Co., P. O. Box 439, Atlanta, Ga., is inquiring for glass manufacturing machinery and mechanical equipment.

H. C. Richardson, 1918 East Franklin Street, Richmond, Va., is planning for the installation of a lathe, bench tools and other mechanical equipment in his machine and automobile repair shop.

A vocational department will be installed in the new high school to be erected at Vanceboro, N. C., estimated to cost about $150,000, for which foundations will be laid at once.

The L. C. Isenhour Co., Colon, N. C., has tentative plans for the establishment of new works to manufacture brick, tile, etc.

The Chapin-Sacks Mfg. Co., First and M streets, N. W., Washington, will build a new three-story ice plant, 109 x 120 ft., estimated to cost about $75,000.

The Reding Gold Mining Co., Danville, Va., recently organized, will establish a power house in connection with its proposed plant in the vicinity of Ashboro, N. C. Motors and other electrical and mechanical equipment will be installed. E. L. Walton is president.

The Port Development Commission, Baltimore, has preliminary plans in progress for a large storage plant on the municipal wharf at Hughes Street.

A vocational department will be installed in the new high school to be erected at Newton, N. C., estimated to cost about $100,000. Benton & Benton, Wilson, N. C., are architects.

Henry M. Earle, Spartanburg, S. C., representing bond holders of the Carolina Light, Power & Railway Co., is arranging for the purchase of the plant and property at a receiver's sale. A new company will be organized to operate the works and extensions and improvements will be made.

The Wilson-Hock Co., City Point, Va., is planning for the installation of new gas engine equipment to be used in connection with a new combination saw.

A. J. Lucas, 2112 East Main Street, Richmond, Va., is planning to purchase sheet-metal working machinery for installation in a local building.

Detroit

DETROIT, Aug. 14.

THE Paige-Detroit Motor Car Co., 100 Fort Street, West, Detroit, will commence the erection of a new building to be used as an enameling department and other operating service. William B. Cady is secretary.

The Michigan Central Railroad Co., Detroit, is considering the erection of new car shops at Bay City, Mich., to replace its present main shops at Detroit. The City Board of Commerce, Bay City, is negotiating with the company regarding a site.

The Columbia Motor Co., 6501 Mack Street, Detroit, has leased the plant of the Saxon Motor Co., and will take immediate possession. It will be used for increased production, developing an output of about 200 cars a day, compared with a present production of about 60.

The Lincoln Motor Co., Detroit, has revised plans in preparation for an addition, one-story, 250 x 880 ft. Albert Kahn, 1000 Marquette Building, is architect.

The City Commission, Cadillac, Mich., has tentative plans under consideration for a municipal electric light and power plant. A bond issue will be arranged.

A vocational department will be installed in the new three-story high and grade school, 185 x 250 ft., to be erected at Houghton, Mich., estimated to cost about $340,000.

The Detroit Marvel Brass Mfg. Co., 1742 Rivard Street, Detroit, is planning the installation of additional equipment for machining and finishing work.

The Filer Fibre Co., Filer City, Mich., manufacturer of pulp and paper products, has arranged for a bond issue of $500,000, the proceeds to be used in connection with the erection of a new mill, estimated to cost considerably in excess of this amount with machinery.

The Detroit Edison Co., Detroit, will commence the immediate erection of an addition to its Superior power plant on the Huron River, near Ann Arbor, Mich., estimated to cost about $50,000. Gardner S. Williams, Cornwell Building, Ann Arbor, is consulting engineer.

The Ford Motor Co., Highland Park, Mich., has had plans prepared for a new two-story slag-crushing plant at River Rouge, Mich. The machinery will be electrically-operated. Albert Kahn, 1000 Marquette Building, Detroit, is architect.

Pittsburgh

PITTSBURGH, Aug. 14.

MACHINE tool business has not been brisk the past week and inquiries are also fewer. Apparently, prospective buyers are awaiting a clearing up of the labor situation before closing against inquiries. The Lima Corporation, Lima, Ohio, will require a number of tools in connection with the extension of its plant, but the list has not yet been issued.

The Weirton Steel Co., Weirton, W. Va., has put out an inquiry for an 8-stand sheet mill with a 2000-hp. motor for the drive. In connection with this installation the company is taking bids for a ladle crane and soon will inquire for three or four mill type cranes. It recently closed with the Koppers Co., Pittsburgh, for a by-product coke nd motor fuel recovery plant, the coking plant to consist of 37 ovens. This business forecasts an inquiry for at least one hoist and probably other equipment. The Otis Steel Co., Cleveland, which is to install a strip mill, is taking bids for the continuous furnaces, and is expected to shortly inquire for the cranes and other equipment. The H. C. Frick Coke Co., is taking bids on a conveyor system for installation in its Scottdale, Pa., mines and the National Mining Co., another Steel Corporation coal mining subsidiary, has just placed through the Dravo-Doyle Co., Pittsburgh, an order for two Nordburg hoists, for operations near Bridgeville, Pa. The Jones & Laughlin Steel Co. has ordered three 10-ton cranes and one 15-ton crane, all of 35 ft. span, for installation at the South Side works, Pittsburgh, for which Manning, Maxwell & Moore, Inc., was the successful bidder.

A local foundry is in the market for a 7½-ton, 3-motor overhead crane and the Standard Steel Spring Co., Coraopolis, Pa., has not yet acted on a 10-ton crane, with two-point lift, for which it inquired several weeks ago. The United Engineering & Foundry Co., which is taking bids on three cranes for the National Enameling & Stamping Co., St. Louis, has revised the specifications and asked for new bids.

S. S. Jones, 30 Sixth Street, Belle Vernon, Pa., has awarded a contract to the Austin Co., Union Arcade, Pittsburgh, for a two-story automobile service and repair plant, 65 x 100 ft., at Donner Avenue and Ninth Street, Monessen, Pa.

The Kurtz Brass & Wood Bed Co., Corry, Pa., will build a two-story addition, 100 x 150 ft.

A new corporation is being formed with capital of 150,000 shares of stock, no par value, to take over and operate the plant and property of the United States Glass Co., South Ninth and Bingham streets, Pittsburgh, the consideration involving $1,920,000. Extensions and improvements will be made at the works. Ernest Nickel is secretary of the company.

The Board of Education, Oil City, Pa., is reported to be arranging a list of machinery for installation at the new local high school, for which plans are being prepared by E. E. Bailey, Chambers Building.

The Freedom Oil Works, Freedom, Pa., has plans under way for a two-story addition, 48 x 75 ft., to its automobile service and repair works. J. E. Martsolf, 513 Third Avenue, New Brighton, Pa., is architect.

A vocational department will be installed in the new high school to be erected at Woodlawn, Pa., estimated to cost about $500,000. Carlisle & Sharrer, Jenkins Arcade, Pittsburgh, are architects.

Fire, Aug. 2, destroyed the plant of the Superior Glass Products Co., Adams Avenue and Nineteenth Street, Huntington, W. Va., with loss estimated at $150,000, including machinery. It is planned to rebuild.

The Miller Motor Co., 228 West Seventh Avenue, Homestead, Pa., is taking bids for a new two-story service and repair works, 75 x 110 ft., at Munhall, Pa., estimated to cost about $50,000. J. E. Dwyer, 5808 Forbes Street, Pittsburgh, is architect.

The Carmichael Motor Co., Clarksburg, W. Va., is planning the erection of a new one-story automobile service and repair works, estimated to cost $50,000. Floyd Carmichael is head.

A vocational department will be installed in the new two-story and basement junior high school building to be erected at Sisterville, W. Va., estimated to cost $100,000. Holmboe & Pogue, Empire Bank Building, Clarksburg, W. Va., is architect.

The Pittsburgh, Lisbon & Western Railroad Co., Lisbon, Ohio, is said to be planning for the installation of machinery at its locomotive repair shops at New Galilee, Pa. N. B. Billingsley is general manager.

The Beatty Motor Co., Fairmont, W. Va., recently organized, has plans under way for a new three-story automobile service and repair works. Carl E. Beatty is president.

The Clarksburg Ice & Storage Co., Clarksburg, W. Va., has plans under way for a new ice and cold storage plant, with daily capacity of about 4500 tons. The Engineering Department of the American Ice Co., is in charge.

The Central South

ST. LOUIS, Aug. 14.

THE Missouri Pacific Railroad Co., Railway Exchange Building, St. Louis, has awarded contract to the T. S. Leake Construction Co., 608 South Dearborn Street, Chicago, for a one-story addition to its car repair shops at Sedalia, Mo., and improvements in present shop.

The Eldorado Development Co., Eldorado Springs, Mo., recently organized with a capital of $300,000, is planning for the installation of additional machinery at its zinc works and will take bids early in the fall. A. B. Stricklett is president and general manager.

The Louisville Garage Co., Louisville, has plans in preparation for a new three-story and basement automobile service and repair building estimated to cost about $250,000, including equipment. D. X. Murphy & Brothers, Louisville, Trust Building, are architects. Lee R. Miles is president.

The Arkansas Light & Power Co., Pine Bluff, Ark., is planning the construction of new hydroelectric generating works on the Illinois River, near Russellville, Ark., estimated to cost about $250,000, with machinery. H. C. Couch is president and general manager.

The United States Engineer Office, Nashville, Tenn., will receive bids until Sept. 5 for steel gates for Lock F, Cumberland River, as per specifications on file.

Fire, Aug. 4, destroyed the power house at the plant of the Madill Grain & Elevator Co., Madill, Okla., with loss estimated at $25,000. It is planned to rebuild.

The Southern Lumber & Mfg. Co., Nashville, Tenn., will commence the erection of two buildings, 30 x 150 ft., and 60 x 200 ft., with warehouse, 50 x 200 ft. The machinery installation is estimated to cost close to $50,000. L. Frank is secretary and general manager.

A vocational department will be installed in the new two-story high school, 70 x 120 ft., to be erected at Hickman, Ky., for which foundations will be placed under way at once. W. Earl Gore, City National Bank Building, Paducah, Ky., is architect.

The Joplin Foundry Co., East Seventh Street, Joplin, Mo., is planning for the installation of two new chain hoists, about 1 and 3-ton capacity, respectively.

The Duncan Machinery Co., 721 North Central Avenue, Knoxville, Tenn., machinery dealer, is inquiring for a lathe, 12-in. swing, belt driven, provided with hand feed and compound rest; also for boilers, horizontal, tubular type, 150 and 200 hp., and for a 150-hp. engine, throttling or slide valve type.

The Central Electric Co., North Market Avenue, Wichita, Kan., will install a lathe, drill press and other equipment at its shops.

The Union Electric Power Co., St. Louis, has been acquired by the American Edison Co., which will extend and improve its power plants and system in this section. The new company will operate with a capital of $25,000,000, and 650,000 shares of common stock, no par value.

The Dixie Power Co., Memphis, Tenn., recently organized, will commence work early in the coming year on its new hydroelectric generating plant on the White River, near Cotter, Ark. The plant will have a capacity of close to 100,000 hp., and is estimated to cost about $15,000,000, including dam and machinery. It will be supplemented by two other hydroelectric plants on the same river, the first to be known as the Buffalo dam, and the other as the Big North Fork dam, with installation to total 25,000 hp. and 30,000 hp., respectively, estimated to cost $5,000,000 and $6,000,000. An extensive transmission system will be built, totaling about 400 miles of steel towers. Colonel Henry A. Allen, 154 West Rand Street, Chicago, is engineer. Walter Powell is president.

The M. J. S. Radio Co., 128 Loraine Avenue, Wichita, Kan., will install a lathe, drill press and other equipment at its local plant.

The Tennessee Electric Power Co., Nashville, Tenn., comprising a recent consolidation of the Tennessee Power Co., Chattanooga Railway & Light Co., and the Chattanooga & Tennessee River Power Co., is disposing of a preferred stock issue of $3,000,000, a portion of the proceeds to be used for extensions and improvements in plants and system.

The Prairie Pipe Line Co., Jenks, Okla., is planning to rebuild the portion of its oil storage and distributing plant, recently destroyed by fire with loss estimated at $75,000, including equipment.

A vocational department will be installed in the new three-story and basement high school to be erected at Liberty, Mo., 140 x 189 ft., estimated to cost about $125,000, for which new bids will be asked at an early date. C. A. Smith, 602 Finance Building, Kansas City, Mo., is architect.

Cincinnati

CINCINNATI, Aug. 14.

MACHINE-TOOL orders slowed up perceptibly last week but no diminution in inquiries was evident. Favorable developments in the rail and coal strikes are confidently expected to release a number of orders for machine tools, purchase of which is being deferred on this account. While there are no new inquiries of size, the aggregate of those outstanding amounts to a considerable sum, and if only a portion of the business is placed, would mean fair activity in the industry. Orders now being booked are mostly for special machinery, suitable for rapid production. A local manufacturer is asking prices on four punch presses and an Indiana manufacturer on six tools, new or used.

Some manufacturers have declared that higher prices are certain to come as wages are steadily advancing and the cost of materials has added as much as 25 per cent to the cost of certain tools. In some cases tools are being sold, it is said, at an actual loss to clear stocks to make room for new designs, prices of which will be higher than those now in effect.

Some shops have taken considerable machine work from railroads, and while this will be only a temporary arrangement, it will keep organizations intact until the railroad difficulty is adjusted and the industry gets back to the position it held before the strike.

The Shartle Brothers Machine Co., Middletown, Ohio, manufacturer of paper mill machinery, has let contract for an addition to its plant on Clark Street, to be used principally as a warehouse.

The Indiana State Reformatory is a prospective purchaser of machine tool and foundry equipment, two new buildings for which are being erected at Pendleton, Ind., 125 x 300 ft. Work is under way on the power house.

A company will shortly be organized in Columbus, Ohio, to manufacture shafting, bolt and nut machinery and automatic screw machine products. C. W. Brightman, G. F. Brightman, H. L. Brightman and H. M. Brightman, all formerly connected with the Brightman Mfg. Co., are the organizers, and contemplated plans call for the erection of a factory.

The Clark Grave Vault Co., Columbus, Ohio, will move to a new location following the sale of its plant to the Herb Paper Box Co. It is understood that the Clark company has purchased property in the north end of the city on which a factory will be erected. No official anouncement of plan has been made.

Indiana

INDIANAPOLIS, Aug. 14.

A NEW one-story and basement building, 38 x 50 ft., will be erected by the Metals Refining Co., 627 Hohman Street, Hammond, Ind., to cost about $35,000.

The Indiana Oil Refining Co., Columbus, Ind., will install an electric generator and other electrical and mechanical equipment in its plant. Stephen Schwartz is chief engineer.

The Indianapolis Street Railway Co., Indianapolis, has plans under consideration for new car shops and extensions and improvements in the power plant and electrical system.

A vocational department will be installed in the two-story and basement high school, 124 x 140 ft., to be erected at Chesterton, Ind., estimated to cost $200,000, and for which work is under way. Herbert E. Erickson, 17 East Fifth Avenue, Gary, Ind., is architect.

The Beveridge Paper Co., Pearl Street, Indianapolis, has filed plans for an addition, estimated to cost $50,000.

The Kentucky Tire Pump Co., Madisonville, Ky., has acquired the building of the Heyns Furniture Co., West Franklin Street, Evansville, Ind., for its new plant. Immediate possession will be taken and the present business will be removed from Madisonville. A new company will be organized.

A vocational department will be installed in the new high school to be constructed at Upland, Ind., estimated to cost close to $100,000. Albert Fisherbuck, Jefferson Township Trustee, is in charge.

The Board of Education, Fort Wayne, Ind., has awarded contract to the Austin Co., 208 South La Salle Street, Chicago, for a one-story vocational and mechanical training school, 40 x 120 ft., estimated to cost about $100,000.

The Mileage Oil Refining Co., Kokomo, Ind., has been reorganized and the capital increased from $100,000 to $800,000, a portion of the proceeds to be used for extensions and improvements in its refinery and system. It is planned to resume operations at the works at Fairmount, Ind., with capacity of about 1200 bbl. per day. J. C. F. Martin is president and S. W. Winder, secretary-treasurer.

The Simplex Lock Rim Co., Petersburg, Ind., manufacturer of metal rims, has work in progress on an addition to its plant. It is proposed to double, approximately, the present capacity. Considerable new machinery will be installed.

The Illinois Central Railroad Co., 135 East Eleventh Place, Chicago, has tentative plans under way for a new engine house and locomotive repair shops at Evansville, Ind., estimated to cost approximately $75,000. C. C. Kunz is general agent at this location.

Milwaukee

MILWAUKEE, Aug. 14.

AS an uncertainty growing out of the dual strikes the machine-tool trade is suffering more restriction. While industries have not abandoned hope of early settlement, the prolongation of the labor difficulties in coal mines and railroad shops has created an unfavorable prospect which has checked fall and winter plans of manufacturers. A fair amount of tool business is passing, but it is limited to the barest necessities. On the other hand, there is a relatively large volume of new business in the foreground, placement of which is to some degree delayed by the labor situation. Included in this prospective volume are the large needs of railroad shops and railroad supply industries which await strike solution.

The Milwaukee Sewerage Commission, City Hall, Milwaukee, will be in the market in about 60 or 90 days for a list of machine tools and shop equipment, including lathes, milling machines, drill presses, boring mills, etc., for a machine and service shop to be erected on Jones island. This will serve the steam generating plant, pumping plant, boiler house, and other units of the sewage disposal plant now under construction at an estimated cost of $10,000,000. Definite specifications of equipment requirements will be available within a short time. T. C. Hatton is chief engineer, and John H. Fowles, secretary of the commission.

The American Airway Transport Co. of Milwaukee, capital stock $100,000, has been incorporated in Wisconsin as a preliminary step in the proposed establishment of a large American aircraft plant and transportation system by A. H. G. Fokker of Amsterdam, Holland, in Milwaukee. The incorporators are Clarence R. Falk, vice-president Falk Corporation; T. C. Hatton, chief engineer Sewerage Commission of Milwaukee; E. M. McMahon, S. J. McMahon, and Fritz Cremer, representative of the Fokker interests in the United States. The new company has opened joint offices at 290 Third Street, Milwaukee, with the Netherlands Aircraft Mfg. Co.—Fokker, Amsterdam and New York. It is now engaged in its initial activities, consisting of a survey of manufacturing and commercial transportation facilities, prospects and possibilities.

The Seaman Body Corporation, 1732 Richards Street, Milwaukee, manufacturer of passenger car bodies, will let contracts this week for two factory extensions, one for metal work and the other for wood-working processes. The new building will be ell-shaped, 100 x 423 and 100 x 225 ft., four stories, of brick and mill construction. The present factory was erected two years ago. The Nash Motors Co., Kenosha and Milwaukee, is one of the principal owners of the Seaman company. Harold S. Seaman is secretary.

The Baraboo Linen Mills, Baraboo, Wis., owned by George S. McArthur & Sons, has plans by C. N. Ward, consulting engineer, Madison, Wis., for improvements and enlargement of its hydroelectric generating plant costing about $30,000. New water wheels and additional generating capacity will be installed.

The Superior Iron Works, Superior, Wis., has taken the contract to manufacture and install practically all of the hoisting machinery for the new ore dock being erected by the Great Northern Railway at Allouez, suburb of Superior. The plant has also booked other orders which require its maximum capacity for 10 to 12 months. While no new plant construction is in immediate prospect, miscellaneous tool and equipment needs are being filled steadily. Ewart H. Williamson is president and general manager.

The Nekoosa, Wis., Motor & Machine Co. is erecting a new brass foundry and machine shop estimated to cost about $15,000, to replace the portions of the plant destroyed by fire early in July.

Jerome Terwilliger, automobile dealer, Clinton, Wis., will build a garage, sales and service building in Beloit, Wis., at 510-512 Broad Street, to be 75 x 135 ft., two stories and basement, and cost about $50,000. Cunningham Bros., Beloit, have taken the general contract.

The Chicago, Milwaukee & St. Paul Railway Co. has ordered the abandonment of the division shop at Tomahawk, Wis., and the transfer of all machinery and equipment to the main shop of the Wisconsin valley division at Wausau, Wis., which is to be enlarged.

The Milwaukee Steam Appliance Co. of West Allis, Wis., has been organized with a capital stock of $100,000 as successor to the Steam Appliance Co., with works and offices at 709 Sixty-third Avenue, West Allis. The articles are signed by L. E. Fichaux, Gustave R. Hoffman and M. E. Engle, all of Fish, Marshutz & Hoffman, attorneys, 120 Wisconsin Street, Milwaukee.

A Maisano, 821 Regent Street, Madison, Wis., has broken ground for a garage and repairshop, 60 x 110 ft., part two stories, estimated to cost $22,000 complete.

The Milwaukee Board of Industrial Education, Seventh and Prairie streets, will soon issue lists of requirements for shop equipment for the second unit of the new Central continuation school, which will be completed about Jan. 1. So far no details are available. R. L. Cooley is director.

The Twin Ports Marine Construction Co., Superior, Wis., has been incorporated with a capital stock of $100,000 preferred and 1000 shares of common stock with no par value, to build and repair vessels. The principal is C. A. Massey, Superior, who has been engaged in general vessel repair work for many years. C. J. Hartley and Louis A. Hanitch, attorneys, appear with Mr. Massey as incorporators.

The Kaerwer Auto Co., Oshkosh, Wis., has let the general contract to the Fluor Brothers Construction Co., local, for a machine shop and service addition, 60 x 130 ft., to its sales and service building. With equipment the improvement will cost about $35,000.

The Scholzen Spring Cushion Co., Milwaukee, has been incorporated with $10,000 capital stock as the development of a factory owned and operated by N. Scholzen at 502 Cherry Street for the manufacture of springs for automobile and furniture cushions, upholstering, etc. C. D. Marks and P. O. Koplin appear with him as incorporators.

The Wisconsin Auto Top Mfg. Co., Racine, Wis., which is enlarging its works, has increased its capital stock from $300,000 to $600,000, consisting of 5000 shares of common and 1000 shares of preferred stock.

The J. Feldman Paper Box Co., Madison, Wis., which recently opened a paper box and container factory on Regent Street, is starting work on a permanent plant on North Charter Street to cost about $45,000, including machinery, motors, etc.

The Tractor & Truck Improvement Co., Merrill, Wis., has been organized with $25,000 capital stock by Daniel Healy, J. G. Frogner and R. E. Kile to manufacture mechanical devices and appliances for the automotive industries. Announcement will be made later relative to plans and equipment needs.

Buffalo

BUFFALO, Aug. 14.

CONTRACT has been awarded by the Lautz Marble Corporation, 861 Main Street, Buffalo, to the Turner Construction Co., for a new one-story plant, 90 x 475 ft., estimated to cost about $125,000, including cutting, grinding, polishing, conveying machinery, etc.

The Western New York Electric Co., 316 North Main Street, Jamestown, N. Y., is planning for extensions and improvements in its power plant and system at Falconer, N. Y., and vicinity, estimated to cost about $454,000.

A machine repair shop will be installed in the new garage and service building to be erected by the New York Telephone Co., Buffalo, at Jefferson and Delevan avenues.

The Eastman Kodak Co., Kodak Park, Rochester, N. Y., has awarded a contract to the Ridge Construction Co., Rochester, for a new two-story building, 160 x 260 ft., estimated to cost $125,000.

The Western New York Utilities Co., Main Street, Medina, N. Y., is arranging for a bond issue of $200,000, a portion of the proceeds to be used for extensions and improvements. C. S. Sweet is vice-president.

A vocational department will be installed in the new two-story high school, 50 x 130 ft., to be erected at Clarence, N. Y., for which excavation work will commence at once. It will cost in excess of $150,000. Herbert C. Swain, 52 West Chippewa Street, Buffalo, is architect.

The Chautauqua Cabinet Co., Mayville, N. Y., is planning for enlargements in its plant to include the installation of additional equipment.

The Chapin-Skelton Machine Co., Syracuse, N. Y., recently organized, will operate a plant to manufacture clothes pressing machinery and parts. The company is closely affiliated with the Brown-Lipe-Chapin Co., manufacturer of automobile transmissions and gears. E. I. Chapin, of the latter company, will act as factory manager. O. H. Green is president.

T. Kennard Thomson and Peter A. Porter, Marine Bank Building, Buffalo, have made application to construct and operate a hydroelectric power plant at Foster Flats, Lower Niagara River. The ultimate project will develop an excess of 1,000,000 hp., and is estimated to cost more than $40,000,000.

The Champion Rotary Motors, Inc., Buffalo, care of L. F. Lindall, attorney, Erie County Bank Building, representative, has tentative plans for a new factory to manufacture rotory engines.

The plant of Jewett & Co., stove manufacturers, Military Road, Tonawanda, N. Y., was destroyed by fire Aug. 10 with an estimated loss of $200,000.

The Gulf States

BIRMINGHAM, Aug. 14.

PLANS are nearing completion for the establishment of works for the Crown Shock Absorber Co., 517 West Building, Houston, Tex., recently organized to manufacture shock absorbers, a part of initial operations to be devoted to assembling. A machine shop will be equipped, as well as departments for enameling and nickel plating. S. B. Segura is president.

The Board of Electric Commissioners, Austin, Tex., will make extensions and improvements in the municipal power plant, estimated to cost about $150,000. New equipment will be installed, including a 5000-kw. generator. Walter L. Eyres is head of the board.

The Merrill-Stevens Drydock & Repair Co., Jacksonville, Fla., has acquired the local plant and business of the T. Murphy Iron Works and will use the property for enlargements.

The Barclay Petroleum Co., Linz Building, Dallas, Tex., has acquired the plant and property of the Star Oil Co., Breckenridge, Tex., for about $100,000. The new owner will continue the operation of the property, and plans for extensions and improvements. George Harris is vice-president and general manager.

The Rockett Foundry & Machine Co., Hattiesburg, Miss., has plans nearing completion for an addition and the installation of new equipment. N. W. Rockett is president.

The Board of City Commissioners, Jacksonville, Fla., will receive bids until Aug. 24 for electrical equipment for the city power house. W. A. Evans is chairman.

A power house will be constructed by the Allied Chemical Co., Dallas, Tex., in connection with its new two-story plant, 40 x 125 ft., at Alma Street and Santa Fe Avenue, for which work will soon be placed under way. It will cost about $50,000. W. R. Sparkman is president, and H. H. Howard, vice-president and general manager.

William H. Kempler, Deer Park, Fla., has plans under way for the construction of a new ice and cold storage plant, 55 x 80 ft., at Melbourne, Fla.

The City Council, Quincy, Fla., will receive bids until Aug. 24 for electrical and other equipment in connection with extensions to the municipal power plant and waterworks, including electric generator, uniflow engine, pumps, boilers, air compressors, motors, etc. The J. B. McCrary Engineering Corporation, Atlanta, Ga., is engineer. J. P. Smith is city clerk.

The mills and timber properties of the Miller-Link Lumber Co., in the vicinity of Shreveport, La., have been acquired by A. J. Peavy, Shreveport, and associates, for $800,000. The new owners will organize a company to operate the plant and contemplate extensions and improvements in the mills. Randall T. Moore, vice-president, Commercial National Bank, Shreveport, is interested in the enterprise.

The United States Engineer Office, 329 Custom House, New Orleans, will take bids until Sept. 5 for the construction of two steel oil barges, each with a capacity of 4000 bbl, for use on the Mississippi River, as per plans and specifications on file.

The Common Council, Brownfield City, Tex., will make extensions and improvements in the municipal electric light and power plant. Additional equipment will be installed.

Hoisting and conveying machinery, elevators and other freight-handling equipment will be installed in the new five-story and basement warehouse, 190 x 250 ft., to be erected by Raymond P. Caruth, Dallas, Tex., and associates, estimated to cost about $550,000. Bertram C. Hill, Dallas, architect, is in charge.

A. C. Campbell, Winnfield, La., is organizing a company to build and operate a plant to manufacture concrete blocks, tiles and kindred products.

The Keystone Lime Works, Keystone, Ala., recently organized, has acquired a local building and will install hydrating, electrical and general equipment for a daily output of 1000 bbl. George L. Scott, Longview, Ala., and W. A. Hammond, Saginaw, Ala., head the company.

The Marion Machine, Foundry & Supply Co., Mexia, Tex., specializing in the production of oil well equipment, is planning to rebuild the portion of its works recently destroyed by fire with loss of $65,000.

The Pacific Coast

SAN FRANCISCO, Aug. 8.

ABOUT five acres has been acquired by the Highland Mfg. Co., Lafayette, Cal., as a site for a new plant to manufacture automobile equipment. A large part of initial operations will be devoted to assembling. A housing development for employees will also be built.

The Guaranteed Battery Equipment Co., 1105 West Pico Street, Los Angeles, is planning to rebuild the portion of its plant, destroyed by fire, Aug. 2, with loss reported at $20,000.

A vocational department will be installed in the new high school to be erected by the Kerman Union High School District, Kerman, Cal., estimated to cost about $150,000. A. Johnson, Kingsburg Bank Building, Kingsburg, Cal., is architect.

The Atchison, Topeka & Santa Fe Railway Co., Kerckhoff Building, Los Angeles, is taking bids for a new electric power plant at San Bernardino, Cal., 80 x 103 ft., estimated to cost about $100,000. The engineering department of the company is in charge.

The Consumers' Milk Co., Los Angeles, has preliminary plans for a new two and three-story ice-manufacturing, cold storage and bottling plant, 60 x 150 ft., to cost about $200,000. Truesdell, Purrington & Newton, 304 San Fernando Building, are architects.

The Atlas Imperial Gas Engine Co., foot of Twenty-second Avenue, Oakland, Cal., has plans under way for an addition to provide extra floor area of about 45,000 sq. ft.

The Pioneer Rubber Co., 68 Sacramento Street, San Francisco, will soon award a general contract for a new two-story plant, 80 x 200 ft., at Pittsburg, Cal., estimated to cost about $150,000.

A vocational department will be installed in the new three-story high school, 145 x 150 ft., to be erected at Selma, Cal., estimated to cost about $200,000, for which bids will be called soon. Norman F. Marsh, 211 Broadway-Central Building, Los Angeles, is architect.

The Eames Co., 55 First Street, San Francisco, manufacturer of factory hand trucks, etc., will soon commence the erection of a new one-story plant at Fifth and Howard streets.

The Potlatch Lumber Co., Spokane, Wash., has commenced the erection of a new mill, estimated to cost about $100,000, including machinery and electrical equipment.

The Peterman Mfg. Co., Tacoma, Wash., is planning to rebuild its lumber mill recently destroyed by fire with loss estimated at $175,000, including machinery. It will be electrically-operated. T. A. Peterman is president.

The Bunker Shingle Mill Co., Bunker, Wash., will soon commence rebuilding its plant, recently destroyed by fire. It is estimated to cost close to $60,000, or approximately the amount of the fire loss. Jesse Wasser heads the company.

The Northwestern Wire & Fence Co., Portland, Ore., has acquired a two-story building at Eleventh and Flanders streets, which will be remodeled for new works.

The Tonga Lumber Co., Seattle, Wash., has tentative plans for rebuilding the portion of its mill recently destroyed by fire, with loss estimated at $150,000, including equipment.

Canada

TORONTO, Aug. 14.

THE past week machine tool buying has been limited, but dealers and manufacturers are still of the opinion that business will begin to show steady improvement early next month. The coal strike and transportation difficulties in the United States are being reflected in some commodities in the Dominion, but interests in practically all lines hold to the expectation that these troubles will shortly be overcome and business will be resumed on something of the old basis in the near future.

The automotive industry continues to hold up its end in equipment buying, but foundries and steel plants generally are only entering the market for special lines from time to time. Wood-working tools and equipment are moving freely and according to the number of plants under construction will be in active demand later in the year. Extensive lists are expected from automobile concerns in Toronto, Windsor and Walkerville, which are erecting factories at these points. Equipment for waterworks, sewage and electric plants is holding up and companies turning out this class of machinery are deriving considerable business from this source. Small tools are in brisk demand with users buying for immediate requirements and stock purposes. Prices are holding firm in most cases, but some shading is again reported in certain districts.

G. W. Gordon, clerk, Port Credit, Ont., is asking for equipment for a waterworks plant, including pumps, valves, castings, erecting overhead steel tank, building settling basin, filters, reservoir and pumping station, meters, gages, hydrants, etc.

Stanley & Aylward, manufacturer of Norman silver plate, will establish a plant at Kingston, Ont., and the removal of machinery from the Toronto plant will begin immediately.

Brodeur & Pilon, architects, Hull, Que., are preparing plans for a factory to be erected at Hull for the Lion Tire Co.

Several thousand dollars damage was done Aug. 7 to the plant of the Galt Malleable Iron Co., Galt. Reconstruction work will be started immediately.

The Bassick Mfg. Co., of Chicago, Ill., manufacturers of Alemite system of lubrication, will establish a manufacturing plant at Belleville, Ont.

The Johnson Wire Works, Ltd., Montreal, has been incorporated with a capital stock of $225,000 by Alexander C. Casgrain, Leslie G. Bell; Sadi C. Demers and others as provisional directors. It will acquire and take over the plant and business of C. H. Johnson & Sons, Ltd., and will continue as agents in Canada for the company.

Receivers who for several months have had charge of the affairs of the American Flexible Bolt Co., Pittsburgh, with a plant at Zelienople, Pa., were discharged by Judge Reid of the Common Pleas Court, Pittsburgh, Aug. 5. A petition presented in behalf of important creditors declared that the affairs of the company had been straightened out in a manner satisfactory to both creditors and stockholders and that as a result of a financial rehabilitation, the company now was in a solvent condition.

Plans of New Companies

[No news in regard to new incorporations is published in THE IRON AGE until it has been investigated by correspondence or by personal call.]

The Allan Mfg. & Welding Co., Inc., was recently organized to take over and conduct the business of the Allan Mfg. & Welding Corporation, and is located at 726 Washington Street, Buffalo, N. Y. The new company will continue to make the Allan polyphase welder, also conducting a general welding repair business.

The Florandin Equipment Co. has been organized by C. H. Florandin with offices at 110 West Fortieth Street, New York, to act as representatives of the Conveyors Corporation of America, Chicago. The new company will also do general contracting business in boiler rooms and industrial plants in the vicinity of New York.

The Oneonta Storage Battery Corporation, Oneonta, N. Y., will have its new structure ready for operation by Oct. 1. It will manufacture Kalo storage batteries.

The Jamestown Malleable Products Corporation, Jamestown, N. Y., has installed a modern foundry and has a plant equipped ready to produce 25 tons daily of malleable castings for automobile and railroad use. H. E. Kies will head the organization.

The Metro Electric Mfg. Co., has been incorporated with a capital stock of $100,000, to manufacture electrical equipment. Plans for operation will be determined in the near future. Address M. Eichner, 1545 Broadway, New York.

The Standard Electro-plating Co. has been chartered under the State laws to manufacture metal goods and to do plating work. It is doing electro-plating in nickel, brass and silver in limited quarters at 155 West Fifty-sixth Street, New York. The erection of a new plant is being contemplated. Incorporators: G. S. Harris, A. Fraun and I. Mines. Hirschman & Roeder represent the company.

The Shuman-Nicholas Co., 2581 Beecher Street, Detroit, Mich., which was recently organized, will handle machinery and other factory supplies as a selling agency. At the present time it is introducing the Chesterfield Cutting Metal, a non-magnetic, non-temperable alloy for use in machining operations on cast iron, cast steel and malleable.

The Accurate Die & Stamping Co., 467 West Thirty-first Street, Chicago, was recently incorporated with a capital of $25,000, to manufacture metal products. It announces that for the present it will manufacture dies and small metal specialties. Incorporators: T. L. Lusk, F. A. Gingerella and J. Schmidt.

The Clifton Mfg. Co., 189 Market Street, Newark, N. J., is in the market for radio equipment parts, which it will assemble to complete its product, the Clifton radio detector.

The Crown Shock-Absorber Co., Houston, Tex., is in the market for compressed steel wire springs, bolts, nuts and name plates. It has been incorporated under the Texas laws to manufacture shock absorbers for Ford cars. Malleable iron castings will be made by the Ross-Meehan Foundries, Chattanooga, Tenn. In the near future the new company plans to open an assembling plant in Houston to assemble the Crown shock absorber, which it is placing on the market. S. B. Segura is president of the company.

The Canton Malleable Iron Co., Canton, Ohio, is adding an annealing department to its plant. It will be in the market for electric charging trucks for annealing ovens in the near future.

The United States Metal Products Manufacturers and Export Corporation, Tampa, Fla., recently incorporated, will manufacture a line of metal products used in the agricultural and automotive industries.

A. Lamy & Son, pattern maker, has purchased the business and property of Parsons Mfg. Co., consolidating the organizations, which have been incorporated under the name A. Lamy & Son, Inc. The business of the Parsons Mfg. Co., which consisted in manufacturing stokers, ash-ejectors, burners and kindred equipment, will be continued together with the pattern making business, which has been conducted by A. Lamy & Son for nearly 30 years. Edward J. Lamy, 535 Livingston Street, Elizabeth, N. J., is secretary.

The Paramount Radio Co., Inc., Warsaw, Ill., has been incorporated to manufacture radio equipment, including a special receiving instrument known as the Paramount. It will also do jobbing and wholesaling in radio supplies.

The Lead-Kote Process, Inc., has been chartered with a capital of $100,000 to coat all kinds of ferrous articles with lead or lead alloys. Temporarily the company will occupy a plant at Sixth Street, Long Island City, L. I., which it is remodeling and hopes to have ready for operations by Sep-

tember. The officers are: M. Robinson, president; I. Lavine, vice-president, and L. C. Bardi, secretary.

The Boiler & Radiator Corporation, Rochester, N. Y., has been incorporated to manufacture heating, plumbing, electrical and builders' supplies with a capital of $30,000, consisting of $100 shares. The directors, all of whom live in Rochester, are: M. S. Welsh, W. F. Devendorf, 470 Court Street, and C. E. Bostwick.

The Erie Enameling Co., Erie, Pa., recently incorporated in Pennsylvania with a capital of $50,000, will do a general line of jobbing enameling work. The company will lease a building of fireproof construction containing 7000 sq. ft. of floor space, now under construction. Officers are H. E. Schabacker, president; H. R. Spencer, secretary-treasurer.

The Commercial Electric Mfg. Co., 442 First Ave., Pittsburgh, recently incorporated with a capital of $25,000 and will manufacture switch boards and electrical control apparatus, and has leased a plant at the above address. The company has supplied its machinery requirements. Officers are R. F. Clark, president; J. M. Miller, treasurer; S. M. Miller, secretary, J. L. Lynds, general manager.

The Ellwood Steel Corporation, Ellwood City, Pa., recently incorporated with a capital of $5000, will manufacture wire nails. The company will install a wire drawing mill and about 20 additional nail machines. This equipment already has been purchased. The company is undecided whether to build an extension to the existing plant or to buy an adjoining factory building.

The Precision & Thread Grinder Mfg. Co., South Twenty-first Street, Philadelphia, has been acquired by A. T. Doud, Philadelphia. The officers are A. T. Doud, president and treasurer, and F. V. Doud, secretary. They together with C. A. White, are the directors. President Doud is a mechanical engineer graduated from Purdue University. He was formerly mechanical engineer for Hale & Kilburn Co., Philadelphia; general superintendent of the Speakman Co., Wilmington, Del. and works manager of the Diehl Mfg. Co., Elizabeth, N. J. During the war he was general manager of the Hero Mfg. Co., Philadelphia, which made gas masks for the American Expeditionary forces under plans and methods developed under Mr. Doud's direction. After the war he was manager of manufacturing for the American Tube & Stamping Co., Bridgeport, Conn. Mr. White is secretary of Leeds & Northrup Co., Philadelphia. He was associated with Mr. Doud at both the Hero and the American Tube & Stamping Companies. F. Rodger Imhoff will be associated with the new organization as consulting engineer. The company's multi-graduated precision grinder is used for grinding thread gages, taps, dies, chasers, etc., also for internal grinding. The company also manufactures a thread lead variator for obtaining precision lead from the ordinary lathe lead screw; also to elongate the lead on parts which are subsequently to be hardened, to compensate for the approximate shrinkage in lead, eliminating correction grinding in non-precision work; and reducing the grinding correction necessary in precision work. Metric threads and any threads of odd or unusual lead may be cut by the use of the variator without requiring special or transplanting gears. Among other things the company makes a gage block for testing lead screws and for setting and testing the lead variator and a permanent alinement wheel truing head for use on all the grinders. The company will be reorganized in all departments.

Trade Changes

The Thompson Foundry & Machine Works, Burlington, N. C., and the Universal Heater & Metal Mfg. Co., Charlotte, N. C., have combined, the merged plant representing invested capital to the amount of $75,000.

Homer F. Livermore, Inc., 85 Pearl Street, Boston, has changed its firm name to the Guaranteed Parts, Inc., at the same address.

B. L. Schmidt & Co., Davenport, Iowa, has changed its name to the Micro Grinder Co., and has moved to Bettendorf, a suburb of Davenport.

Holt & Merrall, Inc., 342 Madison Avenue, New York industrial real estate, has changed its name to William B. Merrall, Mr. Holt having resigned from the company.

The Boustead Electric & Mfg. Co., Inc., Minneapolis, Minn., has been appointed northwestern distributers for the Ideal Electric & Mfg. Co., Mansfield, Ohio, manufacturer of squirrel cage, direct current, and synchronous motors, AC and DC generators up to 1000 kw., motor generator sets, electro-plating outfits, etc. The Boustead company for years has specialized in rebuilt motors and generators and manufactures switchboards.

The U. S. Electro Galvanizing Co., 32 Stockton Street, Brooklyn, has changed its name to the U. S. Galvanizing & Plating Equipment Corporation. Personnel remains unchanged, and it will continue to manufacture mechanical and automatic cleaning, pickling, acid dip, neutralizing, washing and galvanizing apparatus.

The Press Weld Products Co., recently formed, will take the place of the Pennsylvania Iron & Steel Products Co., which was reorganized three weeks ago. D. E. Frew, First National Bank, Ellwood City, Pa., is interested.

The Chapin & Baker Mfg. Co., Inc., and the Skelton Tool Co., both of Syracuse, N. Y., completed a merger in July. The corporate name of the new company is the Chapin-Skelton Corporation, located in the same city at 406 Ash Street. It will manufacture reamers, boring bars and production tools.

The Lonergan Cutting Die Co., 4514 Lexington Street, Chicago, has changed its name to the Lonergan Die Co. It makes dies for cutting soft materials.

The Mercury Radio Products Co., 51 Thomas Street, Orange, N. J., is moving to its new plant in Little Falls, N. J.

The Norwalk Iron Works, Norwalk, Conn., which recently absorbed the plants, patents, designs and property of the Automatic Carbonic Machine Co., Peoria, Ill., is planning the removal of the business to Norwalk.

The Spaulding Electric Co., is now at 1346 Michigan Avenue, Detroit.

The Chicago Flexible Shaft Co., Chicago, announces the change in address of its New York office for Stewart Industrial Furnaces, from 350 Broadway to 16 Read Street, New York.

The American Machine Products Co. has changed its name to the Ampco Twist Drill & Tool Co., Detroit.

The Pittsburgh office of E. J. Lavino & Co. has been removed from 1922 Oliver Building to room 509 of the same building.

The Westinghouse Electric & Mfg. Co., announces the transfer of the industrial heating section from the supply sales department to the industrial sales department. Wirt S. Scott, is directing the activities of this unit and associated with him are M. R. Armstrong, A. T. Ruttencutter, H. W. Lincoln, John M. Strait and C. R. Dakin.

William E. Hoblitzelle, who with his associates recently purchased the controlling interest in the Smith & Davis Mfg. Co., St. Louis, maker of bed springs and beds, has been elected president of the company. Other officers are: Vice-president, James C. Harvey; secretary, J. H. Kentnor, and treasurer, W. H. Whitehill.

The Globe Steel Tubes Co. has been incorporated under the laws of Delaware following the change in the principal interest in the Globe Seamless Steel Tubes Co., Milwaukee, as recently announced. The new corporation has a capital stock of $500,000 preferred and 100,000 shares of common without par value. The incorporators are C. F. Schlundt, Charles G. Jarchow and Thomas J. Christian, all of Chicago. By the recent transfer of ownership, William Renshaw, Chicago, president, and Lawrence Fitch, Milwaukee, vice-president and secretary, retire. Frank J. O'Brien continues as vice-president and general manager. The new ownership is represented by Robert P. Lamont, president American Steel Foundries, Chicago; Paul J. Kalman, president Paul J. Kalman Co., St. Paul, Minn., and Mr. O'Brien. As part of the financing planned when the property was sold, a first mortgage loan of $1,200,000 has been made by the First Trust & Savings Bank, Chicago.

The Curtain Supply Co., 350 West Ontario Street, Chicago, will move to Elkhart, Ind., where a one-story plant, 179 x 400 ft., is being constructed.

The Cherrytree Machine Co., Cherrytree, Pa., following a recent reorganization and change of name to the Brown Mine Equipment Co., has arranged for the removal of its business to Johnstown, Pa., where extensive increase in manufacturing facilities will be provided. The plant will specialize in the manufacture of hoisting machinery, pumps, etc., for mine service. H. V. Brown is president, H. J. Meehan, vice-president, and J. C. Cosgrove, secretary.

The Electro-Magnetic Tool Co., 2902 Carroll Avenue, Chicago, has changed its address to Nineteenth Street and Fifty-second Avenue, Cicero, Ill.

The Barnes Foundry Co., Inc., 169 Second Street, Jersey City, N. J., has moved its office and salesroom to 515 West Fifty-sixth Street, New York. The foundry is now located in a new plant at Freeland, Pa.

Carson & Co., Pennsylvania Building, Philadelphia, has been appointed selling agent in the Philadelphia district by the Sizer Steel Corporation, Buffalo.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossbile to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

	Per Lb.
Bars:	
Refined iron bars, base price	2.83c.
Swedish bars, base price	7.00c.
Soft steel bars, base price	2.83c.
Hoops, base price	4.03c.
Bands, base price	3.63c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	2.93c.
Channels, angles and tees under 3 in. x ¼ in., base	2.83c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	2.83c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	2.93c.
Toe-calk, ½ x ⅝ in. and larger	3.70c.
Cold-rolled strip, soft and quarter hard	6.25c. to 7.25c.
Open-hearth spring steel	4.00c. to 6.00c.
Shafting and Screw Stock:	
Rounds	3.65c.
Squares, flats and hex	4.15c.
Standard cast steel, base price	12.00c.
Extra cast steel	17.00c.
Special cast steel	22.00c.

Tank Plates—Steel

¼ in. and heavier	2.93c.

Sheets

Blue Annealed

	Per Lb.
No. 10	3.93c.
No. 12	3.98c.
No. 14	4.03c.
No. 16	4.13c.

Box Annealed—Black

	Soft Steel C. R., One Pass, Per Lb.	Blued Stove Pipe Sheet, Per Lb.
Nos. 18 to 20	4.00c. to 4.30c.	.....
Nos. 22 and 24	4.05c. to 4.35c.	4.60c.
No. 26	4.10c. to 4.40c.	4.65c.
No. 28	4.20c. to 4.50c.	4.75c.
No. 30	4.45c. to 4.75c.	.....

No. 28 and lighter, 36 in. wide, 10c. higher

Galvanized

	Per Lb.
No. 14	4.30c. to 4.60c.
No. 16	4.45c. to 4.75c.
Nos. 18 and 20	4.60c. to 4.90c.
Nos. 22 and 24	4.75c. to 5.05c.
No. 26	4.90c. to 5.20c.
No. 27	5.05c. to 5.35c.
No. 28	5.20c. to 5.50c.
No. 30	5.70c. to 6.00c.

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
½ in. Butt..	—56	—40	¾ in. Butt..	—30	—13
¾ in. Butt..	—61	—47	1½ in. Butt..	—32	—15
1-3 in. Butt..	—63	—49	2 in. Lap....	—27	—10
3½-6 in. Lap.	—60	—46	2½-6 in. Lap.	—30	—15
7-8 in. Lap..	—56	—34	7-12 in. Lap.	—23	— 7
9-12 in. Lap.	—55	—33			

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	3.50c. to 3.75c.
Annealed soft	3.50c. to 3.75c.
Galvanized annealed	4.25c. to 4.50c.
Coppered basic	4.00c. to 4.25c.
Tinned soft Bessemer	5.50c. to 5.75c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	18¾c. to 19¾c.
High brass wire	19¼c. to 20¼c.
Brass rod	16¼c. to 17¼c.
Brass tube, brazed	25⅝c. to 26⅝c.
Brass tube, seamless	22½c. to 23 c.
Copper tube, seamless	24¾c. to 25 c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 21¾c. to 22¾c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin Grade "AAA" Charcoal 14x20	Bright Tin Grade "A" Charcoal 14x20	Coke—14-20	Primes	Wasters
		80 lb.	$6.05	$5.80
		90 lb.	6.15	5.90
		100 lb.	6.25	6.00
IC.. $10.00	$8.50	IC..	6.40	6.15
IX.. 11.50	10.00	IX..	7.40	7.15
IXX.. 13.00	11.25	IXX..	8.40	8.15
IXXX.. 14.25	12.50	IXXX..	9.40	9.15
IXXXX.. 16.00	14.00	IXXXX..	10.40	10.15

Terne Plates

8-lb. coating, 14 x 20

100 lb.	$7.00
IC	7.25
IX	7.50
Fire door stock	9.00

Tin

Straits, pig	35c.
Bar	42c. to 46c.

Copper

Lake ingot	15¼c.
Electrolytic	15 c.
Casting	14¾c.

Spelter and Sheet Zinc

Western spelter	8 c. to 8½c.
Sheet zinc, No. 9 base, casks	8¾c. open 9¼c.

Lead and Solder*

American pig lead	6¾c. to 7c.
Bar lead	8c. to 8½c.
Solder, ½ and ½ guaranteed	25c.
No. 1 solder	23½c.
Refined solder	20¼c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	75c.
Commercial grade, per lb.	35c.
Grade D, per lb.	25c.

Antimony

Asiatic	6½c. to 7c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	25c. to 27c.

Old Metals

The market continues firm and business is fair. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	11.75
Copper, heavy wire	11.25
Copper, light and bottoms	9.25
Brass, heavy	6.25
Brass, light	5.25
Heavy machine composition	8.50
No. 1 yellow brass turnings	6.50
No. 1 red brass or composition turnings	8.00
Lead, heavy	4.50
Lead, tea	3.50
Zinc	3.25

THE IRON AGE

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ESTABLISHED 1855 VOL. 110, No. 8

Continuous Heating Furnaces for Steel*

Importance of Careful Attention to Roof Slope—Flow of Gases Outlined to Prevent Uneven Heating of Ingots or Billets

BY W. E. GROUME-GRJIMAILO

THE only continuous reheating furnace type whose design has been correctly established is that of the Morgan furnace. All of the other continuous reheating furnaces contain many constructional errors. These may be analyzed in this order.

The hearth may be flat, though latterly there has been a tendency to prefer for this purpose furnaces where the material to be heated is supported upon skids or chairs above the masonry hearth or for low temperature work upon conveyor chains or a "walking beam." These latter constructions are thoroughly logical. In the same manner as with all other mechanisms within which work is placed, and from which it is to be withdrawn after the completion of the operation, a furnace should be correctly fed with the heated gases coming from the combustion chamber. At the same time the products of combustion must be carried away from the heating chamber.

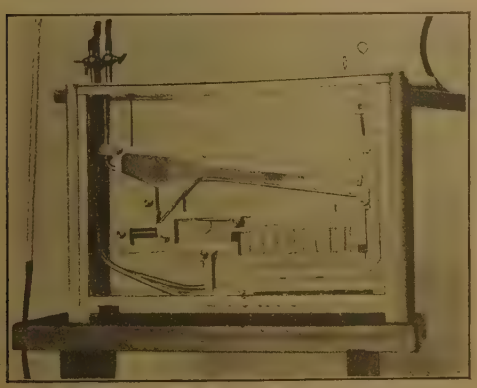


Fig. 1. Model Demonstration of the Circulation of Hot Gases in a Morgan Continuous Heating Furnace

The stagnation or pocketing of partially cooled gases in these furnaces will result in considerable damage to the material being heated, since the hot gases coming from the combustion chamber are thus prevented from passing through the heating chamber, and this reduces the time of contact between the hot gases and the material being heated.

When the ingots or billets are carried upon pipe skids, the channel thus formed below them must be of sufficient height to carry the partially cooled gases dropping below the material being heated and to carry these cooled gases to the waste gas port as it follows the hearth of the furnace, and thus permit their replacement by hotter gases. This arrangement results in a uniform circulation of the gases within the heating chamber. The flame occupies the highest and hottest portion of the furnace under the roof, where the reactions of combustion can be completed before the gases are cooled below their ignition temperature. Then the hot gases drop upon the ignots or billets, losing their heat on coming in contact with them, the colder gases descending to the lower level, from which they flow to the waste gas port.

Compare this type of construction with the working system of many of the continuous heating furnaces of widely known and used designs. Fig. 1 is a photographic demonstration of the circulation of the hot gases (colored kerosene) in a Morgan continuous heating furnace. Fig. 2 is a similar demonstration of the pocket of chilled gas (water) which forms in those continuous heating furnaces having a roof rising toward the charging end. It is readily seen, in this last case, that the forcing out of the chilled gases by the inflowing hot gases is obstructed to the last degree.

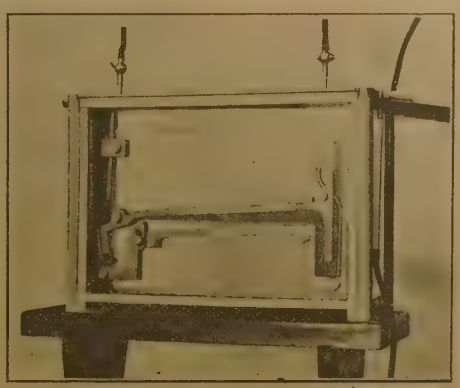


Fig. 2. Model Showing Pocket of Chilled Gas Which Forms in a Continuous Heating Furnace Having a Roof Rising Toward the Charging End

The working of the continuous heating furnace with a horizontal hearth will be slightly better. It does not form a pocket for the cold gases, but the flow of the colder gases to the waste gas port is badly obstructed by the ingots or other material being heated. In the computations for determining the width of the hearth of the furnace, careful consideration must be given to the fact that the cooler gases must be removed from the heating chamber by flowing along the hearth. In practice, the hearth is frequently given a width equal

*From "The Flow of Gases in Furnaces," to be published by Wiley and Co., translated and copyrighted by A. D. Williams, P. O. Box 92, Newark, N. J.

to twice the length of the ingots to be heated, the purpose being the formation of a wide channel past the ends of the ingots.

What reason can be assigned for making the hearth so wide? Would it not be better to proportion the width of the furnace more closely to the length of the ingots or billets to be heated? The author has been unable to find any other reply to the foregoing questions than the following: In order that the furnace may work well, and heat uniformly, it is absolutely necessary that the waste gases shall be rapidly and completely removed from the heating chamber and from contact with the material being heated. The side channels at the two ends of the row or file of ingots being reheated form the only clear path by which these gases may flow to the waste gas port.

If it is desired to have the rear or charging end of the furnace at a low temperature, it will be necessary to give these side channels considerable width.

Fig. 3 shows a continuous heating furnace with a horizontal hearth and roof, in which the height of the gas port over the bridge wall is h; the height of the working doors of the furnace is less than this dimension. The waste gases are carried away from the heating chamber by a port at the level of the hearth. The velocity of the current of hot gases in the heating chamber is retarded, as the chamber is constructed as an inverted weir with a reservoir, the height of the roof above the hearth h_1 being greater than h. As the ingots rest directly upon the hearth, two paths for the current of gases flowing through the furnace are possible: *aa* following the roof and *bb* following the hearth. To reach the waste gas outlet, the hot gases *aa* must descend a distance h_1 and expend in doing this a certain hydrostatic pressure, say d in. of water. The current of gases *bb* must overcome the frictional resistance offered by the ingots, etc.

It is evident that the current of hot gases *aa* cannot pass directly to the waste gas flue unless the resistance offered to the passage of the current of gases *bb*, equal to d_1 in. of water, is greater than d. The greater the width of the furnace in comparison with the length of the ingots, the lower the frictional resistance d_1; and, therefore, there will be little reason to fear that the hot gases will reach the waste gas outlet without giving up their heat to the ingots.

When the ingots are placed upon pipe skids, Figs. 4 and 5, a channel *pp* will be formed below them through which the cooler waste gases pass to the port *q*; further, the heating chamber having a descending roof, a well defined combustion chamber *mm* is formed at the highest part of the furnace, making a rational construction for the heating chamber of a continuous furnace.

Note: This design is supplied with a sand hearth upon which the ingots may be turned to get rid of the cold spots formed by the water cooled skids.

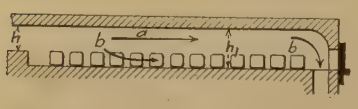


Fig. 3. Continuous Heating Furnace with Horizontal Hearth and Roof

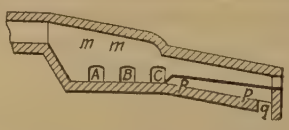


Fig. 4. Furnace with Inclined Roof, Giving Combustion Chamber at *m m* Which Holds Gases Until Combustion Is Complete

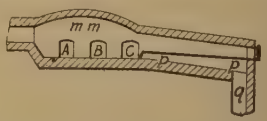


Fig. 5. Morgan Type of Roof, with Slope Retarding the Flow of Burning Gases Until Combustion Is Finished

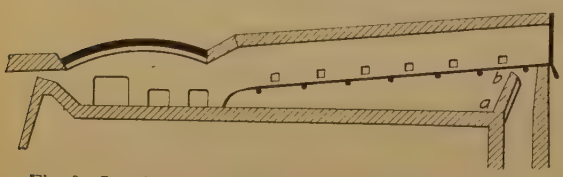


Fig. 6. Longitudinal Section of a Large Furnace of Swedish Design, Built in Russia, Which Had to Be Rebuilt

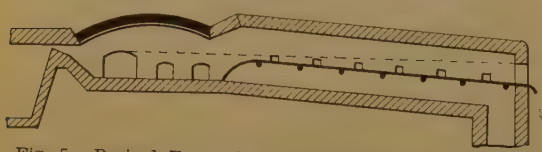


Fig. 7. Revised Form of the Furnace of Fig. 6, Showing Change in Slope of Skids and of Roof and Removal of Bridge Wall

Figs. 4 and 5 show two methods by which the flow of the reacting gases during combustion will be slowed down sufficiently to permit the completion of the reaction in the fore part of the heating chamber, before the gases have an opportunity to come in contact with anything which will cool them below the ignition temperature. In Fig. 4 this is accomplished by an inclined roof, which in the fore part of the furnace is sprung upward. The tongues of flame, until combustion is completed, are held within this higher portion of the chamber.

Fig. 5 shows the Morgan type of roof. The downward slope of the roof acts to retard the flow of the burning gases. The combustible gases and air enter the heating chamber at a considerable elevation above the hearth. The author is of the opinion that there is very little choice between these two methods of holding the reacting gases in the fore part of the chamber until combustion is completed.

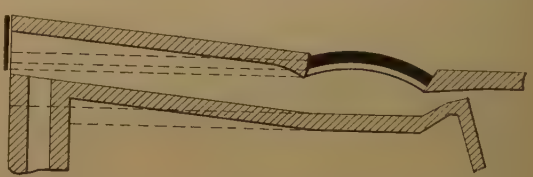


Fig. 8. Another Furnace Design (Solid Lines) Which Had to Be Changed (into the Form Shown by Dotted Lines)

However, attention must be called to an error frequently embodied in furnace structures: The working door openings, *A*, *B*, *C*, etc., should all be located at the same level. If they are located at different levels, the highest door acts as a chimney in connection with lowest door. Cold air will be drawn into the heating chamber at the lowest opening while flame and smoke will escape at the highest door. The sills of all the openings should be at the same level.

The reconstruction, according to the directions of the author, of two costly continuous furnaces of Swedish design, follows. These furnaces were installed at a plant in the Oural district of Russia. Fig. 6 is a longitudinal section of the large furnace as originally built. During its operation it became evident that the wall *a b* caused the formation of a pocket of relatively stagnant cooler gases. As a remedy for this condition, the author suggested the removal of this wall and the

reconstruction of the furnace according to the sketch, Fig. 7.

Note by translator: Furnaces with ascending roofs and hearths may usually be forced to heat with a certain amount of satisfaction, but the fuel expenditure will be several times as great as it should be. One serious trouble with these furnaces is that any delays which cause the material to be held in the furnace result in overheating. Frequently the billets or blooms will sag in the center between the pipe skids and the ends will catch in the roof. When this occurs, it causes considerable trouble and the furnace is frequently damaged in attempts to turn the bent billet or to remove it from the furnace.

The longitudinal section of a smaller, but similar, furnace is shown in Fig. 8. The changes made in reconstructing are shown by the dotted lines. As a consequence of these changes the production of the furnace increased from 11.2 tons to 14.7 tons per hour, about 30 per cent, while the fuel consumption remained the same.

With regard to the form which should be given to the roof of a continuous heating furnace, the following general suggestions may be of service:

If the mixing of the combustible gases and the air is not sufficiently intimate to insure complete combustion in the combustion chamber, recourse is sometimes made to a strangulation of the stream of gases in the port. A big disadvantage of this method arises from the fact that it impresses upon the gases forming the flame an increased velocity. To absorb and reduce this velocity, two special forms of roof construction are used, which are shown in Figs. 7 and 8. If the mixing in the firebox is complete, or if the gases forming the flame flow into a free space in the heating chamber immediately below the roof, which acts as a combustion chamber and is sufficiently large to permit the completion of the reaction, there will be no necessity for reducing the area of port through which the gases enter the heating chamber.

If the rear end of the furnace roof slopes upward, recourse is frequently made to short arches dropped below the roof level, to restrict the flow of the gases. The height of these arches above the hearth may be determined by the formula of Yesmann for the inverted weir. For the ascending or rising roof, and when the hearth is so arranged that it formes a pocket within which the colder gases accumulate, these mixing or strangulating arches will be useless.

As a general conclusion, it may be stated that a roof which drops toward the charging end will result in the concentration of the hottest gases at the front end of the furnace, and is conducive to uniform heating and economy of fuel. A roof which rises toward the charging end will cause the hottest gases to flow toward the charging or rear end of the furnace, where they come in contact with the coldest material. For these reasons, continuous heating furnaces should be built with the roof and hearth dropping toward the charging end. Long furnaces for the uniform heating of long shafts, billets, etc., should be given a roof rising toward the end of the furnace at which the waste gas port is located.

BURNING MINE WASTES

Thirty-Day Test of High Ash and Low Volatile Fuel in Pulverized Form in French Boiler Plant

A series of tests on burning mine wastes has recently been completed by La Societe des Mines de Houille de Blanzy, at Montceau-les-Mines. These tests demonstrated that mine waste of not over ☆ in. size, corresponding in analysis to low grade American anthracite or river coal, could be burned in pulverized form under boilers with a combined furnace and boiler efficiency of 82 to 85 per cent, although the boiler used was not equipped with superheater or economizer.

The fuel employed corresponded, after drying, to the following average analysis: ash, 29.2 per cent; volatile matter, 11.2 per cent; fixed carbon, 59.1 per cent; moisture, 0.5 per cent; B.t.u. per pound, 10,728; fusing temperature of ash, 2120 to 2228 deg. Fahr.

The installation for the test consisted of one Babcock & Wilcox boiler, having 2368 sq. ft. of heating surface. The test consisted of an uninterrupted 30-day run of 704 hr. During this period the hourly evaporation for each 10 sq. ft. of heating surface was 30.19 lb. of water per hour, which exceeded the 29 lb. guarantee. Evaporation of 36 to 45 lb. of water per 10 sq. ft. was easily attained for periods of several hours at a time. The average evaporation per pound of coal was 6¾ lb. of water, which also well exceeded the guaranteed performance of 5½ lb.

During the first 12 days of the test, the best method of operation and regulation was determined, and once having been attained was maintained until the end without any difficulty. The hourly evaporation per 10 sq. ft. of heating surface showed an average of 30 lb. of steam, and the average evaporation per pound of fuel was 7.38 lb. of steam, which corresponds to an overall efficiency of 82 per cent for furnace and boiler. During periods of more than 48 hr., the evaporation per pound of fuel was maintained between 7.61 and 7.65, which is equivalent to an efficiency of 85 per cent.

During the whole time of the test, the ash was extracted easily—partly in a state of dust and partly in a spongy and vitrified state. The smoke leaving the stack was light and of a clear color and caused no deposit of dust in the neighborhood or surroundings of the installation. After cooling off, the combustion chamber was found in good condition and ready to operate again without making any repairs whatever.

Coal preparing and burning equipment consisted of one 5-roller pulverizer, one dryer; two powdered coal feed controllers and two low-pressure burners at the combustion chamber with the necessary blowers for supplying air, for carrying the coal from the powdered coal feeders into the burners. The equipment for the powdered coal installation was manufactured in France along American lines by Societe Quigley-France (Emploi des Combustibles Pulverises) with the assistance and guidance of Quigley Fuel Systems, Inc., New York, and their engineer resident with the Quigley-France company.

Distribution of Iron and Steel Exports

Figures of the Department of Commerce show that 106,647 tons of American iron and steel products were shipped in June to destinations in Asia, with Japan taking 80,806 tons of this amount. North America and the West Indies took 61,534 tons, most of which went to Canada. South and Central America absorbed 26,069 tons, Argentina taking more than one-third of this. Europe took only 11,080 tons and Australasia 8139 tons. Details by countries are shown in the table.

Leading Foreign Markets for United States Iron and Steel in June

Countries	Tons	Countries	Tons
Japan	80,806	Chile	3,015
Canada	47,343	Persia	2,850
Argentina	9,666	Colombia	2,657
Mexico	9,348	Peru	2,647
China	8,941	Chosen	2,289
United Kingdom	8,609	Hongkong	1,611
Brazil	6,237	Honduras	1,240
British India	6,223	Norway	1,057
Cuba	4,843	France	867
Philippine Islands	4,236	Dutch East Indies	791
Kwantung (leased territory)	3,801	Straits Settlements	626
Australia	3,112	Guatemala	607
		Denmark	547

At the Usines Metallurgique du Hainaut, at Couillet, last week, a blast furnace which had been re-kindled a few hours previously suddenly exploded, apparently owing to the charge having dropped after having been choked. Fifteen men were killed outright, including the engineer in charge, and 30 others injured.

Improves Line of Pipe Machinery

The Curtis & Curtis Co., Bridgeport, Conn., manufacturer of the Forbes pipe cutting and threading machinery, has placed on the market a line of improved pipe threading machines for hand, belt or electric power, in all commercial sizes, from the small, ¼ to 2 in. size, to a machine for 8 to 16 in. pipe.

The new line is said to be almost 100 per cent greater in speed and the design simplified so that operation is now semi-automatic. A die release and lock, attached to the die head, serves to lock the dies in position during the threading operation and to automatically unlock and open the die at the completion of the thread. A turn of a lever instantly resets the die. When running on a certain size, all threads will be identical, both as to length and diameter. The cutting off device provided is automatic in its feed and simple in design, cutting the pipe off square and leaving no burr.

High speed steel tools are provided as regular equipment. Spur gears are used throughout, no bevel

Machine for Threading and Cutting Pipe. Increase of speed and semi-automatic operation are among the improvements of the new design. Spur gears are employed throughout

or worm gears being employed. They are machine cut from fibre, machine steel and cast iron, and suitable gear guards are provided.

These machines do not require special foundations, are portable and occupy a small amount of space. They are designed to thread pipe bends or other crooked work.

Melt of Ohio Foundries Increases

The melt in Ohio foundries increased during July from approximately 50 per cent to over 58 per cent according to the monthly report of the Ohio State Foundrymen's Association, which based its data on reports received from 69 members. These reports showed some decrease in the total stocks of pig iron on hand as well as in the amount of pig iron received, these decreases being attributed to conditions resulting from the coal and rail strikes.

The association, of which Arthur J. Tuscany is secretary-manager, has moved its offices from the Wade Building to 405 Century Building, Cleveland.

Lower Spanish Duties for American Products

WASHINGTON, Aug. 22.—Iron and steel, machinery, motorcycles, automobiles, motor trucks, chassis and detached parts made in the United States are included in products which are given the benefit of reductions in Spanish tariff duties. These reductions are similar to those which had recently been granted to France as a result of the Franco-Spanish treaty, and gives assurance that American products will continue to enjoy most-favored-nation treatment which they have thus far been accorded in Spain. The concessions and duties granted by Spain to Switzerland by the treaty of May 16, 1922, which in practice had already been extended to similar American products, are likewise confirmed by the present order of the Minister of Finance of Spain. Owing to conflicting interpretations on the part of the Spanish customs officials as to the application of the concessions granted to France to similar products of other countries, a definite ruling from the Spanish Minister of Finance was informally requested by Commercial Attache Cunningham, working in co-operation with the American embassy. The concessions in duties granted to France by the terms of the Franco-Spanish treaty and extended to the United States amount to reductions of 20 to 25 per cent from the second column, which has heretofore been the minimum scale of import duties into Spain. Among the principal lines of goods affected by these reductions, which are of interest also to American exporters, are pipe fittings, locomotives, printing and electric machinery, motorcycles, automobiles, motor trucks, etc.

More Hearings on Pittsburgh Basing Case

WASHINGTON, Aug. 22.—The Federal Trade Commission has concluded to submit additional direct testimony in the Pittsburgh base case and will reopen hearings for this purpose on Sept. 11. At the offices of the commission, it was stated that the place of the hearing is to be determined by Examiner Bennett and Attorney Steinhauer of the commission, who now are on vacation. The nature of the additional testimony also was unknown to the commissioners here, but it was said that the taking of this testimony will require only a brief time after which the Steel Corporation's side is to be presented, followed by rebuttal testimony by the commission.

Renewal of Merger Efforts Expected

YOUNGSTOWN, Aug. 21.—With the return of executives from their vacations, more definite developments in connection with merger of several Valley independents are expected. The two companies most prominently mentioned now as merger possibilities are the Brier Hill Steel Co. and the Trumbull Steel Co. To round out its finishing capacity, it would be necessary for the Brier Hill company to expend a large sum and probably necessitate some financing. An alternative would be a merger with the Trumbull company, to which Brier Hill would bring valuable raw material resources.

It is known that the possibilities of such an amalgamation have been very seriously considered.

Little Increase in Coal Output

WASHINGTON, Aug. 22.—The Geological Survey in making its report on coal production for the twentieth week of the strike (Aug. 14-19) said it was too early to learn the immediate effect of the agreements signed at Cleveland between mine workers and operators; that the production from the mines that were already operating is estimated at about 4,300,000 tons, and that it is unlikely that the union mines now reopening in Ohio and elsewhere will raise the total output for the week much above the 4,576,000 tons produced in the preceding week. It was pointed out that while mines long closed are reopening, there has been a recurrence of acute railroad disability in certain of the non-union and open shop fields. Reports made to the Central Fuel Committee at the same time indicated that only a little new coal production had resulted from the reopening of mines in Pennsylvania, but these were followed by reports that there were likely to be appreciable increases in Ohio and Pennsylvania early this present week.

In a notable bridge souvenir edition, the Springfield (Mass.) *Republican* has commemorated the dedication of the new Hampden County Memorial Bridge over the Connecticut River, a project which is costing the county some $6,000,000. Several supplements to the paper are devoted to this and other notable bridges and to historical and biographical articles relating to the locality. The new bridge, of reinforced concrete, takes the place of a covered wooden bridge, erected in 1805 and still in service. The engineers were Fay, Spofford & Thorndike, Boston, and the contractors were H. P. Converse & Co., Boston.

For Greater Use of Steel in Dwellings

Potential Tonnage Is Large, Calculated on the Building Movement of 1922—Some Figures Based on the Employment of Pressed Steel Joists

SOME interesting comments have been made on the editorial "Steel in Dwelling Houses," which appeared in THE IRON AGE of Aug. 3, page 291. The point was made in the editorial that the first barrier to the general use of steel in the construction of dwelling houses is in the training and habits of those who are engaged to build houses. The carpenter's work in wood has not yet been standardized, after several generations of house-building, and it was pointed out that the hope of steel must lie in the investment builder, the capitalist, who builds a large number of houses as a business. The problem, it was suggested, is not merely the substitution of one material for another, but the fundamental one of creating a new practice and mechanism for building houses.

One engineering company, writing to this office, referred to the obstacles it had encountered in promoting the use of steel for dwellings and agreed that the case had been well stated in the editorial. The letter concluded: "The writer of the article hit the nail on the head, but the fact still remains that there is a wonderful opportunity for an outlet of enormous tonnage in this direction if properly created."

Joists of Steel Are Put in Place as Indicated in the Bottom Oval and Over Them Is Then Fastened Expanded Metal, on Which in Turn Is Spread Concrete with Wooden Nailing Strips Embedded in the Concrete to Receive the Wooden Floor. The central picture is an illustration of the use of the steel lumber for the framework of a dwelling house

Gilbert Canterbury, of the Central Steel Co., Massillon, Ohio, in commenting on the editorial, said that if the writer had in mind dwellings in which rolled (heavy) sections were used, his position was undoubtedly right, and such a change would be fundamental and revolutionary. "I submit, however, that his line of reasoning is incorrect when applied to the principle of fire-safe, first floor construction with light (pressed) steel joists and metal lath."

Mr. Canterbury's letter is so interesting that we reproduce it in large part below:

"Let us establish common ground by stating that available timber is growing scarce and that in twelve years there will not be enough timber left for use as 'dimension lumber.' Something will have to take the place of wood in dwelling frames. Steel is the logical material.

"Now, on my part I can grant that the change from wood to steel will have to be 'sold' to the entire consuming public and that the building trades will have to be educated in the handling of such a radically different material as steel. To jump right from an all-wood frame to an all-steel frame unquestionably would be a fundamental change, as your editorial has put it.

"But are changes usually wrought in that way? Wouldn't it be more natural for the change from all-wood frame to all-steel frame to be made a step at a time? I think it would, and I have spent a lot of effort guessing what the first step would be.

"In your editorial the statement is made that it is easy to 'substitute' metal lath for wood lath. Right. Now, then, what will be the first step in the 'fundamental' change? I say it will be by the substitution of light steel joists in the first floor in place of wood 2 x 8s, 2 x 10s and 2 x 12s. Here is my line of reasoning:

Some Advantages of Steel

"Joists are plain sections, be they wood or steel. The only field work done on a wood joist is to cut to

length and 'fire-bevel' the ends. It wouldn't be much of a trick to cut steel joists in the field, but there is no earthly reason why it shouldn't be done at the structural steel yard before the material is taken to the job. Fire bevels are not necessary for steel joists.

"Steel joists are as light as wood joists. They are set in place exactly the same as wood joists. Steel joists will not warp, shrink, sag or burn.

"Most dwelling fires originate in the basements or actual first floor sections. In the basements (of all dwellings except in the extreme South) are located such major fire hazards as heating equipment, open-flame laundry stoves, hot water heaters, gas meters, horizontal hot water and hot air pipes, coal and wood supplies, etc. Support the first floor on steel joists, spread over them a thing slab of cinder concrete reinforced and centered by metal lath and you have established a good non-combustible bulwark between these basement fire hazards and the livable sections of the dwelling. Furthermore, such a floor section is dust-proof and vermin-proof. You can nail wood sub-floor directly to the steel joists if you want to use the steel joists only, or you can imbed screeds in the concrete slab for a wood floor finish.

"A 7-in. pressed steel joist weighing 5½ lb. to the lineal foot will take care of most first floor spans in dwelling construction. Space these joists 19 in. on centers and you have about 3½ lb. of steel to the square foot of floor area. A dwelling measuring 30 x 30 ft., which would be about average, is 900 sq. ft., and would require a total of 3150 lb. of steel joists—a ton and a half.

"Steel joists now sell at a price which means that this substitution, including metal lath and a concrete slab for the first floor, would not add over 1 per cent to the cost of the dwelling, or in round figures, about $100.

"There wouldn't be anything so very revolutionary about this one step. Carpenters would still have plenty of work. Two men would set the steel joists for a first floor (bearing wall job) in four or five hours. From that point on it would be regular construction practice. A lot of lumber would be saved and thus the day would be deferred when steel sections would have to be used in such difficult and complicated construction as partitions, walls, roofs, etc.

If All Dwellings Used Steel

"Now, from the standpoint of the steel industry, this may look like small potatoes. Let me point out, however, that the building industry is erecting this year (1922) about 280,000 single dwellings in the United States. The normal for several years will be about 250,000 annually.

"Counting 1½ tons to the dwelling, as above, one and one-half times 250,000 equal 375,000 tons. Pressed steel joists weigh approximately one-third the corresponding section in rolled structural steel. If rolled I-beams were used in this construction, the total of steel thus consumed would be close to 1,000,000 tons. The country's capacity for structural steel shapes (exclusive of pressed joist sections) is only 180,000 tons monthly. These figures will give you an idea of the importance of potential tonnage in the first floors of dwellings.

"T. J. Foster, of the National Bridge Works, Long Island City, N. Y., read a paper on 'Steel Lumber' (pressed steel joists) at the American Iron and Steel Institute meeting last autumn. You printed it in THE IRON AGE of Nov. 24, 1921, p. 1331. I believe you would be surprised if you were to look up the amount of steel joists actually being produced and sold this year. This industry, which is new in the iron and steel trade, is growing very rapidly. The subject of metal lath would also be interesting to you as a growing outlet for steel sheets.

"The whole subject of steel for the building trade is a big one and I verily believe it will show the most pronounced development during the next ten years."

JULY IN FABRICATED STEEL

Almost the Entire Industry Reporting to Department of Commerce—Figures for Second Quarter Revised Upward

In its collections of the sales of fabricated steel work, the Department of Commerce now reports that it is getting figures from "almost the entire fabricating industry." Reports were received from 121 firms and figures were obtained from these companies not only for the business done in July but for the sales of the three months preceding, April, May and June. One result has been a sharp upward increase of the figure taken as indicating the fabricating capacity of the country, the 121 firms being credited with having a total capacity of 204,540 tons against 180,000 tons, the amount which has been taken for a number of years as the monthly capacity of the bridge and structural shops of the country. The new capacity is 13.6 per cent greater than the former, and the apparent rate of contracting has therefore been scaled down from the figures originally given. However, the revised tonnages for the second quarter of the year bring the actual volume of business above any of the estimates previously given.

The actual sales in July of the 121 concerns was 127,765 tons, which is 62.5 per cent of the shop capacity of these same concerns, given as stated, as 204,540 tons. The Department uses the figure of 204,540 tons as capacity against which to indicate the rate of contracting.

The extent of the cooperation which the Department is getting from the industry is indicated by mentioning that compared with hearing from 121 concerns in the latest canvass, the number heard from in June was 96, in May 82, in April 75, while the Bridge Builders and Structural Society in issuing the March statistics based the figures on returns from 64 companies.

The subjoined table gives the tonnage of bookings for April, May, June and July for the 121 identical firms, together with the corresponding percentage of capacity put under contract. These figures thus replace those given already for the second quarter and now put the total amount of business taken in fabricated steel work for the seven months of this year at a total larger than any of the preceding ten years, even including those in which there was active building of factories for the prosecution of the war. While the total for July at 127,765 tons represents but 62.5 per cent of capacity, the monthly total is still a large one, seeing that the average for the last ten years was barely 55 per cent of capacity.

Actual Fabricated Steel Sales for the Past Four Months of 121 Identical Firms

Month	Tonnage Booked	Per Cent of Capacity
April	180,420	88.2
May	158,721	77.6
June	145,989	71.4
July	127,765	62.5

To meet enlarged freight requirements of steel plants at Warren and Niles, the Pennsylvania Railroad has mapped out a program of development which will require the expenditure of a large sum. According to the schedule, 11 tracks, each one mile long, are to be built west of Niles, Ohio, four additional tracks are to be established at the Mosier yard, immediately west of Youngstown, while another main line track is to be built from Youngstown to Niles. The Trumbull Steel Co. and the Brier Hill Steel Co. are among the interests which will benefit from this program.

A pulverized coal system is to be installed in the Owosso, Mich., plant of the American Malleables Co., Lancaster, N. Y. The Holbeck system is to be employed and will be installed by the Bonnot Co., Canton, Ohio. The equipment will cover 24 annealing furnaces, three melting furnaces and two small boilers, with provision for equipping core ovens at a later time.

Free Zone System Included in Tariff Bill

Departure of Interest to Many Manufacturers—Not Certain the Plan Will Be Adopted in Conference

BY L. W. MOFFETT

WASHINGTON, Aug. 22.—Establishment of foreign trade zones in ports of entry of the United States, proposed in an amendment to the tariff bill adopted by the Senate last Wednesday, upon the motion of Chairman Jones of the Committee on Commerce, opens a wide range of interest and would mark a highly important change in the American tariff system. Proponents of the measure, which was recommended for passage by the Committee on Commerce on Aug. 15, 1921, claim that the "free" zone system recognizing the more intimate and interdependent character of world relations would effect a vast improvement in perfecting the means of intercourse between nations and that it would be a great aid to the American Merchant Marine.

The proposed "free" zone system is of importance to all business interests of the country engaged in foreign trade, including iron and steel, machinery and automobile manufacturers. It remains to be seen whether the amendment will be adopted in conference and enacted into law. Senator McCumber, chairman of the Committee on Finance, in charge of the tariff bill, accepted the amendment with the statement that it would be given serious consideration in conference. He conceded that the Senate had not given this broad subject the necessary study. Previous attempts had been made to pass legislation of this kind in a separate bill, after it had been reported out favorably by the Committee on Commerce, whose Republican members unanimously favor it. It also is favored by Democrats. President Harding was a member of the committee when the legislation was being considered by it and it is therefore assumed that he would accept the "free" zone system if it is adopted in conference. One of the outstanding features of the free zone system, which Republicans maintain is not an assault upon the protective system, would be to wipe out the intricacies and red tape involved in tariff customs regulations under the present system of bonded warehouses, the drawback and the bonded manufacturing warehouse. These apply with particular stress to certain lines using metal products, assembling automobiles and warehousemen.

Plan of the Zone System

The proposal under the free zone system is to authorize the establishment of places at the various ports, in which, under proper regulations and precautions to protect the Treasury of the United States, goods designed not for domestic consumption, but for transshipment, may be landed without the various restrictive regulations which now apply to such goods in the bonded warehouses. Then, when the time has come for transshipment to the place where they are intended to go, they may be taken out without further restriction. Regarding metals, the drawback system, which would be abolished by the "free" zone plan, has applied particularly to aluminum, tin plate, lead ore, and zinc, although application of the drawback system to tin plate has progressively decreased in importance owing to the ability of the American tin plate industry to meet foreign competition. In this connection it is noted that in 1907 under the tariff act of 1897, drawbacks on tin plate imports, which were remanufactured into finished products in this country and then exported, amounted to $1,525,282, while in 1918, they totaled $2,359,486, and in 1913 declined to $45,271. In 1915 they were increased to $451,246, while in 1916 they dropped to $22,473. The tin plate drawbacks under the tariff acts of 1897, 1909 and 1913, represented 0.14 per cent of the total drawbacks under those acts, up to and including 1916.

The legislation has been recommended by the Tariff Commission, which in a report made to the Committee on Commerce last year, pointed out conditions in Europe and the conditions in the United States and the advantages of the proposal and the disadvantages of the present systme.

As pointed out by Senator Jones, the proposed free zone system means that if, for instance, someone in Europe desires to send 500 tons of goods to South America and that is all he has to ship, and a vessel bound from Europe to New York can take on that tonnage as a part of its cargo, it may do so, bring in the 500 tons of goods and discharge them in the zone where they may be kept until there is a ship ready to take it into South America. The senator declared that the plan would facilitate the assembling and transshipment of commodities which constitute a large item in the world's commerce and it was estimated that such business amounts to about $4,000,000,000 annually. Where some of the products to be brought to free zones in the United States require completion, they could be added to for purpose of assembly. For instance, automobile bodies, chassis, or engines could be provided by American interests, the finished product being assembled in warehouses in the free zone territories, which would be practically foreign territory and exempt from tariff duties. The bill was amended to prohibit manufacturing in the zones but probably this will be made allowable later. Under the present system, goods that are to be completed and transshipped, go to bonded warehouses where there is heavy expense for producers, because of a complicated system of Government regulations and a drawback of 99 per cent of the duty is granted when the transshipment takes place. Senator Jones pointed out that in the past a great deal of American business heretofore has been done in a sort of triangular way and that much of American produce destined for South America has left this country and gone to Europe and then to South America through transshipment in foreign vessels. It is desired, he said, to avoid that, so the United States can do much of the business from Europe to South America by making American ports one apex of the triangle by encouraging the shipment of goods to this country which are destined for South America, and then transport them to South America. It was stated that this will not only give American interests the business in this country, but it would also furnish cargoes for American ships. It was declared that one of the great difficulties with the American Merchant Marine is in securing cargoes bound for this country on return voyages. He said that the main thing is not to provide for what cannot now be done, but is to remove the restrictions under which goods intended for transshipment must be placed in bonded warehouses and comply with the drawback provisions provided by law and in the proposed legislation. The proposal was declared to be simply an expansion of the drawback and the bonded-warehouse systems, providing a freer and better facility for the distribution of goods to the markets of the world. As pointed out by the Senate Committee on Commerce, the system does not do away with the present Government agencies, but it does open the way for another agency that may be made use of to avoid many of the vexations of the present system.

Relation to Protective System

The committee in its report on the bill last year said that the only substantial objection that had been urged is that the measure is a subtle device to undermine the protective tariff system. The Republican members of

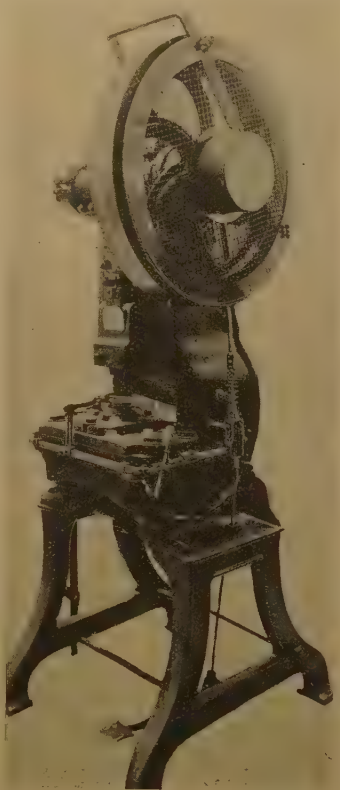
the committee gave this objection special consideration, the report pointed out. It added: "They are protectionists from principle and would not favor any measure inimical to that system. They came to the conclusion that this measure does not affect in any way the principles of a tariff either for revenue or for protection. It provides for a very valuable instrument in connection with either system. If it has any special relation to either system, it is especially desirable in connection with the enforcement of a protective tariff and will strengthen rather than weaken that policy. Action under it will add greatly to the value of protection."

The Tariff Commission recommended the free zone system after the investigation covering so-called free zone ports of the world, including those at Hamburg and Copenhagen. Because the term "free" in connection with "port" or "zone" is misleading, inasmuch as it has no relation either to port charges or to any policy of free trade or protection, the Tariff Commission says that a "neutral" zone would be more properly descriptive. Those who have urged the establishment of so-called free zones, have suggested that there be three or more ports on the Atlantic Coast, including New York, Philadelphia and Boston and at least two ports on the Pacific Coast, possibly San Francisco and Portland. Suggestions also have been made for the establishment of one or two such ports on the Gulf Coast, particularly at New Orleans.

New Safety Guard for Power Presses

A safety guard for power presses designed to protect the operator at the point of operation and also to prevent the press from repeating, has been developed by J. J. Flynn, 72 Grand Street, New York.

The device is illustrated as attached to an inclinable press but can be applied also to straight-sided upright, and double-crank machines, and can be used in blanking, stamping, piercing, and forming operations. The press is under the operator's control at all times, a feature which is claimed to permit of increased production by relieving the operator of the monotony of having an arm swinging before him, giving him also a free hand to feed the blanks to the die.



Safety Device Arranged to Give Protection at Point of Operation and to Prevent Press from Repeating

The operator in pulling the hand lever of the guard has an advanced motion which moves the guard at the point of operation, forcing the operator's hand away. Further movement of the hand releases the treadle stop, permitting the treadle to be forced downward and releasing the clutch. The lever inside of the press is set within ⅛ in. of the downward stroke of the press before it starts on its upward motion. This forces the lever downward, releasing a dog connecting the upper and lower treadle rods and permitting the upper rod to move upward, locking the press and thus preventing it also from repeating.

When released the hand lever is forced back by spring pressure, which locks the upper rod. To start the press the pressure treadle must be released so that it will move upward, re-engaging the dog in the upper rod.

The position of the hand lever and the mounting of the treadle rod are shown clearly in the illustration.

Advance in Price of Seamless Steel Tubes

The Detroit Seamless Steel Tubes Co., Detroit, announces that due to the continued heavy demand for seamless steel tubes, the advancing prices for raw material, and higher labor costs, the following prices have been put into effect by the company:

Seamless Steel Merchant Boiler Tubes—Carloads

1 in.	57 per cent
1¼ in.	48 per cent
1½ in.	47 per cent
1¾ in.	30 per cent
2 in. and 2¼ in.	32 per cent
2½ in. and 2¾ in.	36 per cent
3 in.	40 per cent
3¼ to 4 in. inclusive	45 per cent
4½ in. and 5 in.	37 per cent

The usual differential applies for less than carload quantities.

The usual extra for heavy gages and long lengths remains the same.

Seamless Steel Mechanical Tubing

Base discounts on direct shipment from mill in large quantities on all steels under 0.30 carbon, 85 base discount. On 0.30 to 0.40 carbon steel, 83 base discount, plus usual differentials and extras for cutting.

Seamless Steel Locomotive and Superheater Tubes

Outside Diameter		Net Price
2 in.	No. 12 gage	14c. per ft.
2 in.	No. 11 gage	15c. per ft.
2 in.	No. 10 gage	16½c. per ft.
2¼ in.	No. 12 gage	16c. per ft.
2¼ in.	No. 11 gage	16½c. per ft.
2¼ in.	No. 10 gage	18¼c. per ft.
3 in.	No. 7 gage	35½c. per ft.
1½ in.	No. 9 gage	13c. per ft.
5⅝ in.	No. 9 gage	53c. per ft.
5½ in.	No. 9 gage	55c. per ft.

Plus extras for forming and for long lengths.

Increased Use of Scrap

YOUNGSTOWN, Aug. 22.—Valley interests are purchasing old material for steel making purposes on a broader scale, indicating preparations for expanded production. In some cases, open-hearth furnaces are being charged 60 per cent scrap, and the rest pig iron. Under ordinary conditions, the reverse ratio is maintained. Shortage of pig iron and its high price are compelling steel makers to resort to scrap in larger tonnages.

Prices are very susceptible to supply and demand. Heavy melting grades are nominally quoted at $18, but any firm buying movement will produce a markup. One recent purchase of hydraulically compressed scrap, involving several thousand tons, was closed at $16.50.

New Rail Rates Ordered

WASHINGTON, Aug. 22.—In a decision handed down last Thursday in connection with a complaint of the West Virginia Rail Co., the Interstate Commerce Commission held that lines serving Huntington, W. Va., Pittsburgh, and Johnstown, Pa., Newark, Ohio, and Cumberland, Md., must not later than Nov. 11 establish rates on new light iron and steel rails to points in the Pittsburgh-Buffalo and Central territories, no greater than 78 per cent of the sixth class rates from the points of origin to the destinations. The rates on this class of rails are to be 20 times the rate per unit of 112 lb.

Bethlehem - Lackawanna Merger Approved

Directors Act Without Waiting for Action of Federal Trade Commission—Extensive Building Program Announced

THE merger of the Bethlehem Steel Corporation and the Lackawanna Steel Co. was approved at the meeting of the board of directors of the former company held last Thursday, Aug. 17. President Eugene G. Grace, of the Bethlehem Steel Co., announced that there would be a readjustment of the capitalization of Bethlehem, calling for a retirement of all classes of stock now outstanding and exchanging them for new preferred and common stock, both of which will have complete voting power. The readjustment is subject to the approval of the stockholders, who will meet on Sept. 18. This is a departure from the old plan under which control of the company's operations rested in the hands of a few large stockholders.

400,000 Tons Additional Capacity

President E. G. Grace of the Bethlehem Steel Co. made an announcement in the past week concerning extensions the company is to make at the Sparrows Point, Md., plant. These lately authorized improvements include the addition of a 250-ton tilting open-hearth furnace to the present No. 2 open-hearth plant, making a complete unit of five such furnaces. In addition to the present five 70-ton rebuilt stationary furnaces in the No. 1 open-hearth building, four 100-ton stationary furnaces are to be built. Thus the increase in ingot output at Sparrows Point, through the new additions, will be about 400,000 tons per year. This additional steel will be rolled down in the present finishing mills.

Another important improvement authorized at Sparrows Point is the installation of a 10,000-kw. turbo-generator with boiler plant, condensing system, etc., as an auxiliary to the present gas engine station and to provide power for the additional ingot tonnage.

Chairman Schwab's Statement

Charles M. Schwab, chairman of the board of directors, and President Grace said in a letter to Bethlehem stockholders:

While no additional financing is required in connection with the Lackawanna purchase, it will eventually be wise to spend from $10,000,000 to $15,000,000 in improving and enlarging the Buffalo plant. Your board prefers to raise this money and be in a position to meet other future capital needs through the sale of stock instead of bonds. Your corporation is advised by its bankers that it should be in a position to offer cumulative 7 per cent preferred stock instead of the present non-cumulative 7 per cent preferred stock. Your board therefore recommends the authorization of $15,000,000 of new 7 per cent cumulative preferred stock.

Your board has become convinced that it will be to the advantage of the stockholders and greatly strengthen your corporation in meeting future capital requirements if its financial structure can be simplified by consolidating its entire outstanding stocks into two classes, 7 per cent cumulative preferred stock with full voting powers and common stock with full voting powers. Argument seems to be unnecessary to show the advantages of the substitution of this simple financial structure in place of the present capitalization involving four classes of stock, to which a fifth class would be added by the creation of the proposed new 7 per cent cumulative preferred stock. In order to accomplish this it is proposed to offer to the stockholders the opportunity of exchanging their holdings on the following bases:

1. The existing $30,000,000 8 per cent cumulative convertible preferred stock to be exchangeable for new 7 per cent cumulative preferred stock for a limited period on the basis of $115 in new stock for each share of the old stock, and thereafter, until the privilege shall be terminated by the board of directors, on such basis, not exceeding that specified, as shall be fixed by it.

2. The existing $15,000,000 of 7 per cent non-cumulative preferred stock (and the additional stock of that class to be issued in connection with the Lackawanna purchase) to be exchangeable for new 7 per cent cumulative preferred stock for a limited period, which may be extended by the board, dollar for dollar.

3. The existing Class B common stock (and the additional stock of that class to be issued in connection with the Lackawanna purchase, to be exchangeable for common stock with full voting powers, dollar for dollar.

It is proposed that a sufficient increase in the capital stock shall be authorized to accomplish the purposes above stated and provide an additional amount of common stock of approximately $38,000,000, to be available for use, in the discretion of the board of directors, in the payment of stock dividends and for any properties that may be acquired.

Upon the consummation of the Lackawanna purchase, the sale for capital purposes of $15,000,000 of the new 7 per cent cumulative preferred stock and the consolidation of the existing classes of stock as above proposed, the outstanding capital stock of your corporation would be as follows:

7 per cent cumulative preferred stock...	$77,000,000
Common stock	82,608,500

Members of your board of directors (whose holdings consist principally of preferred and common shares with full voting powers) and other large stockholders have already approved the plan above outlined, which the board of directors recommends to the stockholders for their favorable action.

Federal Trade Commission Investigation

Regarding the purchase of the Lackawanna Steel Co., the letter points out that "the fact that a formal complaint by the Federal Trade Commission is pending would seem to furnish no reason for further delaying the call for the meeting of stockholders to act upon the proposed purchase, the legality of which is supported by the opinions of counsel of both companies." The Attorney General of the United States some time ago investigated the consolidation and said "I am unable . . . to find in the exhaustive investigation I have made any reasonable warrant for asserting that the public will suffer if this consolidation is consummated."

Under the contract of purchase the consideration to be paid for all the properties of the Lackawanna company, in addition to the assumption by Bethlehem of the existing liabilities and obligations of the Lackawanna company, is $308,680 in cash and Bethlehem stock for Lackawanna stock par for par. The new Bethlehem stock thus to be issued is divided as follows: $12,500,000 7 per cent non-cumulative preferred and $22,608,500 Class B common stock.

President Grace's View of Conditions

A resumption of the prosperity which was interrupted when the strikes broke out will again be ushered in with heavy buying, according to President Eugene G. Grace. This prosperity, however, qualified Mr. Grace, will be short-lived unless settlements of strike troubles are made upon a sound and economic basis. This means a liquidation of labor which represents the important factor in the cost of production.

"Unless the settlement eventually contemplates the liquidation of cost as represented through labor, then the settlement is not sound and will stand in the way of reinstatement of prosperous times," said Mr. Grace, following the meeting of the Bethlehem Board of Directors.

"If the settlement is on a basis which increases the cost of production and requires increases in the selling prices of steel," said Mr. Grace, "it will have the effect of stopping investment money from going into business and, therefore, will curtail business rather than stimulate it."

Inclusions in Aluminum Alloy Sand Castings

Technical Paper 290, "Inclusions in Aluminum Alloy Sand Castings," by Robert J. Anderson, metallurgist, has been issued by the United States Bureau of Mines.

In aluminum alloy foundry parlance, metallic and non-metallic inclusions are termed "hard spots," and in aluminum alloy sand castings and in die castings they are very troublesome. The inclusions differ so widely that the term "hard spots" is only roughly descriptive at best; in fact, the term is exceedingly undesirable and should not be accepted in the nomenclature of metallography. However, because it has been in common usage for such a long time, it is used in this paper to include all kinds of metallic and non-metallic inclusions that cause difficulty in polishing and machining aluminum alloy castings. Hard spots in aluminum alloy sand castings are well known to founders, and certain kinds of hard spots are frequently found in aluminum base die castings. Ordinarily, hard spots are not noticed during the routine inspection of rough castings in the foundry, but usually come to light during machining. Much difficulty may be experienced when machining aluminum alloy castings containing hard spots, and their presence may be one of the principal causes of machine shop scrap, in addition to ruined milling cutters, lathe tools, and drills. Certain kinds of hard spots may be found when gates are being sawed off at the band saw, or on cutting at the sprue cutter, or when chipping and grinding is being done. Furthermore, several kinds of hard spots may be readily detected in the foundry by fracturing the gates; if hard spots are present in the gates, they will normally be present in the castings. Whether or not hard spots are numerous in an aluminum alloy casting, this defect may be such as to cause much difficulty in machining and, at times, even to prevent the finishing of machine work after it has begun. Milling cutters, turret lathe tools, drills, and other machine tools can be quickly dulled and rendered unfit for cutting when the cutting edges strike hard spots in a casting. When hard spots are present in aluminum alloy castings, they slow down machining, cause many castings to be scrapped, involve loss of machine work, reduce production, ruin cutting tools and irritate machine operators.

Although many representative aluminum alloy founders, by care in practice, have been able practically to eliminate hard spots and resulting trouble when aluminum alloy castings are machined, others still have periodic difficulties because of this defect. A number of foundrymen have suggested at various times that the Bureau of Mines investigate hard spots, put the available information on record and suggest preventive methods. Such an investigation was undertaken and carried out in connection with the Bureau's work on casting losses in aluminum alloy foundry practice. The present paper is published as a contribution to the literature of aluminum foundry practice and as a guide to founders in preventing scrap losses from hard spots in castings.

Study of Uranium and Other Alloy Steels

The results of studies in the experimental production of certain alloy steels are given in Bulletin 199, by H. W. Gillett, chief alloy chemist, and E. L. Mack, assistant alloy chemist, which has just been published by the United States Bureau of Mines.

The Bureau of Mines has recently made up experimental heats of alloy steels for the army and the navy. The steels for the army were desired for work on gun erosion, especially as regards the effect of nitrogen on the steel. The request from the war department for this experimental work was made during the course of the world war and followed the receipt of information from a creditable source that Germany was using uranium steel in the liners of some high-power naval guns. It was stated that uranium stiffens steel at high temperatures, and raises the softening point some 200 deg. C., so that gun erosion is reduced. The fact that the German guns retained accuracy of fire at the end of the Jutland naval engagement was ascribed to the uranium steel gun liners. Somewhat similar reports had been received as to the use of molybdenum steel.

The ingots made for the navy were in two series, the first being rolled, heat-treated, and given physical tests by the Bureau of Standards. The second series was made in larger ingots, which were rolled into plates, cut up into smaller plates, and heat-treated to different Brinell hardness numbers by the Halcomb Steel Co. Physical tests of this series under several heat treatments are being made by the navy.

Another series of alloy steels was made up in the course of co-operative work with the Vanadium Corporation of America and the Welsbach Co.; various impact and endurance tests are being made on these steels, the results to be given in a later publication. The present report deals only with the preparation of the ingots on any of the series of steels.

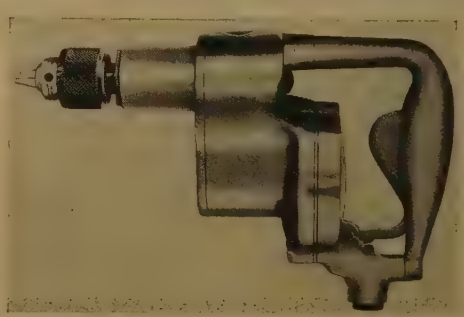
Some of the points brought out in preparing the steels, particularly as to the recovery of the alloying elements from the various ferroalloys entering the steel, may be of interest and are therefore put on record at this time. The indirect arc furnace finally used seems also to be a sufficiently useful piece of experimental apparatus to justify its description.

Detailed information regarding tests made with uranium, silicon, manganese, molybdenum, chromium, vanadium, nickel, copper-nickel, aluminum, zirconium, cerium and boron as alloying agents are given in Bulletin 199, which may be obtained by addressing the Bureau of Mines, Washington, D. C.

Turbine Air Drill

A portable drill, known as the No. 2-A Tiny turbine, having a capacity of 5/16 in. in steel and ⅜ in. in wood, and weighing 6 lb. complete, is being offered by the Turbine Air Tool Co., Cleveland.

The propelling portion of the tool is of turbine construction, and is made from an aluminum-magnesium alloy which is said to have the strength of mild steel with about one-third the weight. The speed of the turbine being high, a gear reduction is employed, the shafts and gears of which are of high-carbon chrome-nickel steel, oil treated. Ball bearings are used throughout. The housing is of an aluminum alloy. Lubrication of the tool is accomplished by having all bearings and gears in one housing and using a semi-liquid lubricant sufficient for 3 to 6 months run.



The Propelling Member Is of Turbine Construction Made from an Aluminum Magnesium Alloy

The member containing the nozzles has been designed to permit of easy cleaning of dirt or foreign matter that may become lodged in the nozzles.

Announcement was made last Friday by the Navy Department of the sale of the old fleet refrigerator ship Glacier to the Bardo Steel & Machinery Co., Seattle, Wash., for $22,000. The same company also purchased for $15,000 each the hulks of submarines F-2 and F-3. The three vessels were sold at Mare Island Navy Yard. The navy tanker Alameda, also on the West coast, was sold for $100,000 to the Newport Engineering Co., Washington, D. C.

Numerous Changes in the Metal Schedule

Few Are, However, Important—Duty on Pig Iron and Scrap Reduced—Bill Now in the Hands of the Conference Committee

BY L. W. MOFFETT

WASHINGTON, Aug. 22.—With the Tariff Bill passing the Senate last Saturday by a vote of 48 to 25, after being before that body for four months, and 13 months after it was first acted upon in the House, the metal schedule is largely similar to the form in which it passed the House. While numerous changes have been made in it by the Senate, they are not taking them as a whole, of any essential importance with certain exceptions, as they relate to the duties themselves. It is generally conceded that in phaseology and in reclassification the Senate improved the metal schedule, but its final action has left the more important rates not much changed from those provided in the House bill. The Senate Committee on Finance itself had made some important changes, such as placing manganese ore on the free list and reducing the duty on ferromanganese to $2.50 per ton. The Senate, however, upset the action of the committee and restored the House duty of 1c. per lb. on manganese ore and placed a duty of 1⅞c. per lb on ferromanganese containing more than 1 per cent carbon as against a duty of 2½c. per lb., provided in the House bill. The Senate bill also makes 30 per cent the division between ferromanganese and spiegeleisen. The Senate, as reported previously, also made substantial reductions in duties on tool steel ores and alloys. The changes made during the past week by the Senate in the metal schedule are shown in the accompanying table, as well as the change made in duties on magnesite, the latter restoring those reported originally by the Senate Committee on Finance.

Among the changes included is a reduction from $1.25 to 75c. per ton on pig iron and from $1 to 75c. per ton on scrap; a slight reduction in rates on structural and fabricated material and a reduction from 7-40 of 1c. per lb. on steel rails to 1-10 of 1c. per lb.; and an additional duty of 10 per cent on cold-worked nickel, alloys, bars, etc., and slight decreases in the duty on tool steel.

Senatorial Discussion

In reply to a suggestion by Senator Lenroot of Wisconsin that with the rate on pig iron reduced the reduction should be carried throughout the metal schedule, Senator Smoot of Utah, a member of the Finance Committee, said that the reduction amounted to so little that he did not know how it could be done throughout the schedule. He stated that importations are of the heavy products made from pig iron, which before becoming finished material generally come into the United States as ballast. The Senator from Utah said that the committee did not think it worth while to take that class into consideration, but called attention to the fact that reduction had been made in the rates upon steel rails and structural steel. He also said that it is to be remembered that the committee added considerable expense to the manufacture of steel in the United States "through what I call the very high rate on the

Changes Made in Metal Schedule of Tariff Since Tuesday, Aug. 15

PARAGRAPH 301—Duty on pig iron reduced from $1.25 to 75c. per ton and duty on scrap reduced from $1 to 75c. per ton.

Paragraph 302—"Tantalum" struck from list of alloys taking a duty of 25 per cent, an amendment added providing a duty of 40 per cent on ductile tantalum metal or ductile nonferrous alloys of tantalum metal.

Paragraph 312—Rate of 7/20 of 1c. per lb. on structural steel reduced to 1/5 of 1c. per lb.; also duty on fabricated material reduced from 25 to 20 per cent ad valorem.

Paragraph 318—Duty on woven wire cloth with meshes finer than 30 and not finer than 90 wires increased from 30 to 35 per cent.

Paragraph 322—Duty of 7/40 of 1c. per lb. on steel rails reduced to 1/10 of 1c. per lb.

Paragraph 385—Amendment adopted providing an additional duty of 10 per cent over the 25 per cent substantive duty on nickel, alloys, bars, rods, plates, sheets, etc., when cold-rolled, cold-drawn, or cold-worked.

Paragraph 388—Amended so that duty of 1½c. per lb. on lead in ores and mattes of all kinds shall not be applied to the lead contained in copper mattes, unless actually recovered, the provision that the duty should not be applied until after 2000 tons of such lead had been imported in one year, having been eliminated.

Paragraph 347 amended so as to include sewon fasteners, to take a duty of 60 per cent ad valorem, included in item referring to snap fasteners and clasps.

Paragraph 304—Duty on alloy, ingots, blooms, slabs, sheets and plates, etc., valued above 16c. per lb., reduced from 25 to 20 per cent ad valorem.

Paragraph 305—Duty on tool steel containing more than 6/10 of one per cent of nickel, cobalt, vanadium, chromium, tungsten, molybdenum, or any other metallic element, used in alloying steel, reduced from 10 to 8 per cent.

Paragraph 360—Proviso added admitting free of duty philosophical and scientific instruments, etc., which are imported for educational purposes.

Paragraph 375 (Substituted for original paragraph)—Metallic magnesium: Crude, ingots, magnesium alloys and scrap, 10c. per lb.; in coils, plates, sheets, bars, rods, circles, disks, blanks, strips, rectangles, squares and other unfinished forms, 20c. per lb. on the metallic magnesium content; ribbons, tubing, wire, powder, and all other finished articles, 40c. per lb. on the metallic magnesium content and 20 per cent ad valorem.

Paragraph 204a (Earthenware schedule)—Amendment of Senator Calder of New York, restoring duties of Senate Committee on Finance on magnesite adopted. The duties now provided are 5/16 of 1c. per lb. on crude, ⅝ of 1c. per lb. on caustic calcined and 4/10 of 1c. per lb. on dead, burned and grain magnesite. The Senate Committee of the Whole had previously increased these duties to a level of the House rates carrying ⅛ of 1c. on crude and ¾ of 1c. on the other grades.

alloys." He declared that the rates on alloys far exceed the reduction that was made upon pig iron. Senator Lenroot, showing his lack of knowledge of the steel industry, said that, "There is one corporation that fixes the price; and the higher the rate the greater their ability to fix the price to the American consumer." Senator Smoot made the rather surprising statement that "If it were simply for the United States Steel Corporation, these rates would not be as high as they were. I frankly admit that; but the independents are fearful that the prices here will drive them out of business." Senator Lenroot expressed regret that the committee had not seen fit to carry on the reductions in the duties on rolled products in accordance with that made on pig iron.

Senator Phipps' Amendment

The substitute amendment on metallic magnesium was offered by Senator Phipps of Colorado, and replaces the original paragraph 375. The amendment provides that crude material shall come in at the rate of 10c. per lb. instead of 40c.; that the semi-finished forms take a rate of 20c. and that the highly finished forms pay a duty of 40c. per lb. and 20 per cent ad valorem. Senator Phipps explained that metallic magnesium is a substance lighter than aluminum and has greater strength. He stated that it has been found useful in automobile and airplane construction, and that its uses have developed during the last few years, and particularly during and since the war. It was his opinion that the original amendment did not give a proper differential as between the crude, the semi-finished and the finished forms, and because of that he offered the amendment. He told the Senate that the material is made by an electrical process and can be generally introduced in the United States. It is now largely used in Germany, it was stated, where it is most largely produced, and to a great extent supplements the use of aluminum. Chairman McCumber of the Committee on Finance said that the matter is one which is in disagreement, and that the amendment would be accepted and the rates determined upon in conferenee.

Senator Calder's Position

Senator Calder, in offering his amendment reducing the duties on magnesite, pointed out that this commodity is now on the free list and while he favored giving it some protection, he supported his amendment on the ground that the calcined magnesite is used in building operations. Senator Pomerene of Ohio, who supported the reduced rates, said that while some time ago magnesite occupied a certain field in the steel industry, some of the manufacturers have found a substitute for it. He declared that the higher rate which had been proposed may cut off all importations and that, if so, it would defeat the revenue feature of the bill so far as it relates to magnesite. He added that he did not think that the higher rate should be put on at the expense of every user of steel in the country. Senator Jones of Washington and Senator Gooding of Idaho defended the higher rates.

An amendment by Senator Fletcher of Florida to place common horseshoes on the free list and an amendment by Senator Jones of New Mexico to restore the House duty of 35 per cent on card clothing, which in the Senate bill carries a duty of 45 per cent, were rejected.

Efforts to Reduce Rates

The metal schedule was an object of much debate and vigorous but vain efforts were made, particularly by Democratic Senators, to reduce many other rates, such as those on aluminum, kitchen utensils, and cutlery. The metal schedule also was the object of an elaborate and detailed analysis submitted by Senator Simmons of North Carolina, ranking Democratic member of the Committee on Finance, who in having tables and data concerning the metal schedule inserted in the *Congressional Record*, said that the material was furnished by "official experts assigned to the minority of the Committee on Finance in collaboration with the experts of the Fair Tariff League." To say the least, this analysis occupying 9½ pages of 6 point type in the *Record* is interesting even if its value as a statistical study might not be seriously considered. The material takes up each item in the schedule, except some important parts, such as the ferroalloy section, and in its arguments either against the duties proposed or for free listing many of the iron and steel products now dutiable, discusses alleged costs of production, selling prices, profits, exports, imports, relation of wages to prices and makes a comparison of tariff rates under the Payne-Aldrich and Underwood-Simmons Tariff acts and the Senate bill. The big point intended is to show the so-called tariff protections to manufacturers, the cost to the consumers and the revenue to the Government. The table gives the remarkable figure of $1,197,000,000 as the tariff "allowance" to iron and steel manufacturers and the still more amazing figure of $2,504,000,000, as the cost to consumers of seven heavy and 21 light products. The revenue to the Government is given as only $6,890,950. Senator McCumber, chairman of the Committee on Finance, who says that the total revenue from the tariff bill will be $400,000,000 annually, estimates that duties in the metal schedule will raise $18,000,000. Tables submitted by Senator Simmons give figures for the individual items. As to the ratio of wages to factory selling price, the minimum on rolled products is 5.9 per cent, relating to tin plate, while the maximum on rolled products is 22.2 per cent pertaining to bar steel, but cast iron pipe is given a rating of 29.3 per cent. Roughly, the cost to consumers has been arrived at merely by doubling the alleged tariff "allowance" to manufacturers. Those preparing the table apparently recognized that its figures would be questioned, as indicated by comment in the following paragraph:

Criticism Invited

"We invite the criticism that these figures are preposterous. The Senate bill is preposterous. Consequently, its effect upon American life can only be preposterous. Its evil proposals can never be fully availed of by its beneficiaries. It gives these beneficiaries, however, the supporting arm of the Government for price rigging and price maintenance, with the consumer's recourse only to the Department of Justice against unlawful practices to which the bill incites its beneficiaries."

It points out that the figures represent a potential and mostly unnecessary addition to the American cost of living on heavy steel products, plus only 20 per cent on the great number of highly finished steel products.

Sent to Conference

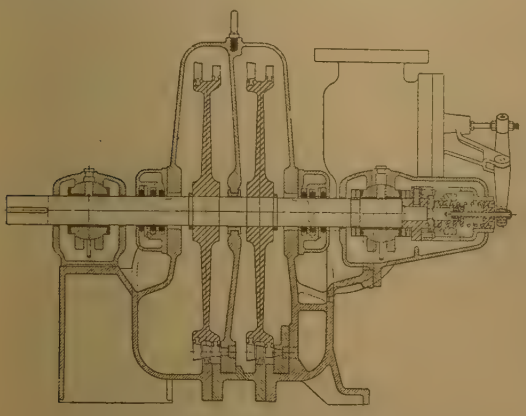
The tariff bill has gone to conference under a special rule and Republican leaders say they hope to have it enacted into law by Oct. 1. While there have been reports that it will be the object of sharp controversy in conference, particularly as it relates to the American valuation and foreign valuation plans, the former being the House and the latter the Senate plan, the general belief is that Chairman Fordney of the House Committee on Ways and Means will yield to the Senate. The adoption by the Senate of a provision for flexible tariffs, it is believed, will be important in influencing House conferees to accept foreign valuation as a basis for assessing duties.

The adoption by the Senate also of the so-called foreign trade zone system may likewise be the object of controversy. But on the vast number of 2000 odd amendments made by the Senate, there promises to be comparatively little disagreement. The only Republican Senator who voted against the bill was Senator Borah of Idaho. It was supported by three Democrats, Senators Broussard, Kendrick and Ransdell. The conferees are Senators McCumber of North Dakota, chairman of the Committee on Finance; Smoot of Utah, and McLean of Connecticut, Republicans, and Simmons of North Carolina, and Jones of New Mexico, Democrats. House conferees are Representatives Fordney of Michigan, chairman of the Committee on Ways and Means; Green of Iowa, and Longworth of Ohio, Republicans, and Garner of Texas and Collier of Mississippi, Democrats.

Turbine for Steel Mill Service

The Standard Turbine Corporation, Wellsville, N. Y., a company recently formed, is placing on the market a new steam turbine, said to be particularly adapted to steel mill service. It is suitable for connection to pumps, blowers and generators, either direct or through gears. Manufacture of this equipment on more of a production basis than has been customary in steam turbine work is planned.

Features of the machine are its heavy construction and simplification of component parts. The coupling-end bearing is supported on a pillow block resting on a pedestal integral with the lower half of the exhaust end, to eliminate vibration and misalinement. The steam-end bearing support is large in diameter and is placed directly under the bearing. The disks are in one



Steam Turbine for Connection to Pumps, Blowers and Generators. Heavy and simple construction are features peculiarly fitting it to steel mill use

piece, each carrying two rows of buckets. Although making necessary the use of forgings instead of plate steel, this construction, it is emphasized, permits a longer fit on the shaft and reduces disk stress at the hub.

The governor is of simple construction. It is connected to the valve with a single lever, the fulcrum of which is rigidly attached to the turbine casing and there are no encumbrances on this connection which may shift its position and cause over-speeding. The emergency governor is independent of the main governor, the valve of the former being also independent of the main valve.

Butterfly valves are used, the seats of which are swept continuously by steam at low velocity, keeping them clean. The governor valve bushing and seats form an integral part, and are of bronze. This construction is said to permit closing both valve seats at the same time at all temperatures, which would be difficult if seats were screwed into a casting of a different material, having a different coefficient of expansion.

The so-called pivot block of the governor is located in the interior, the governor spindle being stationary, which eliminates vibration and permits positive lubricaton of the governor parts. The governor may be removed without dismantling. Thrust collars are said to be made by a special process which assures their faces being exactly perpendicular to the shaft. Bearings, valve seats and packing are made to gages and are interchangeable and readily removable. There are no high pressure joints on the horizontal face of the machine. The nozzles are reamed to suit the steam conditions and capacities. The blading is of bronze, monel metal, or cupro nickel, according to steam conditions.

The two members of the unit are self contained and standard, and one may be replaced conveniently without dismantling the other member. The machines will be built in capacities up to 600 hp. for condensing and non-condensing service. They will also be offered complete with generator, pump and fan sets.

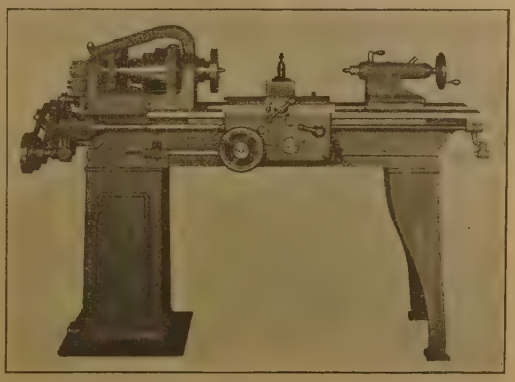
Light Manufacturing Engine Lathe

The latest addition to the line of the Hendey Machine Co., Torrington, Conn., is the Junior model 12-in. engine lathe, shown in the accompanying illustration. This is a plain-geared lathe with belt feed and is intended essentially for light manufacturing and also for use in technical and vocational institutions.

The headstock, tailstock, carriage, apron and lead screw are of the company's standard design. The leg at the headstock end is of the cabinet type, fitted with shelves and partitions for storage purposes. Suitable guards are provided for inclosing the feed belt and the feed gears. The screw cutting is effected through ordinary change gears, the power cross feed and longitudinal feed being driven by a feed belt over two 3-step cones. The feed-belt speed is modified within a wide range by the use of change gears. A two-speed countershaft is provided and both speeds may be run in the same direction at different r.p.m., giving 16 spindle speeds. The starting, stopping and reversing of feeds is controlled from the apron.

The lathe shown has an actual swing of 12⅝ in., and a 5 ft. length of bed, other lengths of bed being available. The swing over the carriage is 7¼ in. and the distance between centers is 27¼ in. The length of carriage bearing on the bed is 16⅝ in. The dimensions of the front and the back bearing are 1⅞ to 2⅜ in. taper, 3 11-16 in. long; and 1 13-16 to 2 3-16 in. taper, 2⅞ in. long, respectively. The hole through the spindle is 15-16 in., the nose of the spindle being 2 in. in diameter, 8 threads per in. and the tail spindle 1 21-32 in. in diameter.

The proportion of gearing in the head is 10.4 to 1. Feeds are by belt or gear. The lead screw is 1 in. in diameter, 6 threads per inch, and the machine will cut screws 2 to 36 per in. Feed and screw cutting reverse is at the apron, and the cross-feed screw is graduated in thousandths of an inch. Cone diameters are 2⅝,



Plain Geared Engine Lathe with Belt Feed for Light Manufacturing

4¼, 5⅞ and 7½ in., countershaft pulleys being 12 by 3½ in. and running at 160 and 210 r.p.m.

All attachments for the 12 in. standard lathe are applicable to this machine. A compound rest, center rest, power cross feed, and large and small face plates are included in the equipment.

New Bureau of Standards Standard Samples

A new standard sample of tin-base bearing metal No. 54 is now being issued by the Bureau of Standards with a provisional certificate. This sample has the approximate composition: Tin, 88 per cent; antimony, 7 per cent, and copper, 4 per cent. In addition it contains small amounts of lead, iron, bismuth and arsenic. The price of this sample is $2 per 140 grams.

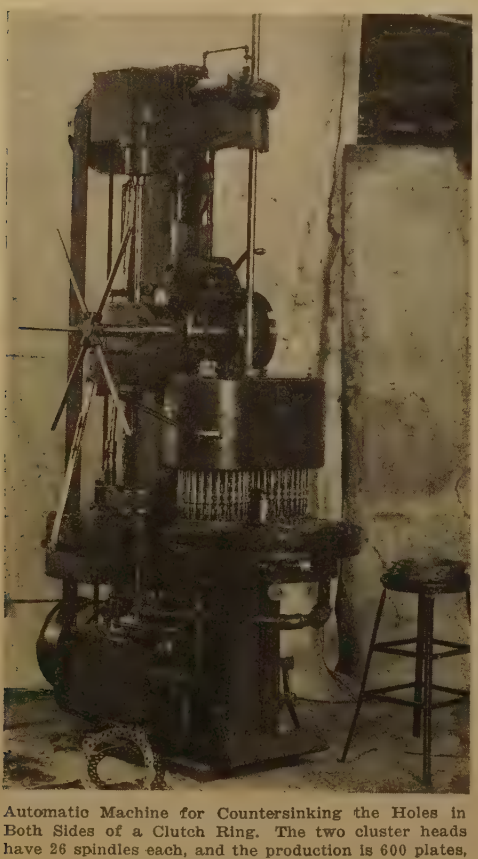
The following renewals are also ready for distribution at the price of $2 per 150 grams: Renewal No. 14b of basic open-hearth 0.8 per cent carbon steel No. 14a; renewal No. 19b of acid open-hearth 0.2 per cent carbon steel No. 19a; renewal No. 20b of acid open-hearth 0.4 per cent carbon steel No. 20a.

High Production Countersinking Machine

An automatic machine in use at the plant of the Hudson Motor Car Co., Detroit, for countersinking holes in both sides of a clutch ring, the production from which is 600 plates per hr., or 520 holes countersunk per min., is shown in the accompanying illustration.

This equipment was built by the Fox Machine Co., Jackson, Mich., and is claimed to have displaced three of four men, whom it was hard to keep on the job because of the muscle exertion in keeping up the continuous hand movement. On a single spindle drill 60 pieces were done an hour and on the machine illustrated 300 pieces.

The machine is full automatic, the head moving ½ in. up and down by a cam movement at the rate of 10 cycles per min. The table is rotated by gearing which is timed to move while the head is going



Automatic Machine for Countersinking the Holes in Both Sides of a Clutch Ring. The two cluster heads have 26 spindles each, and the production is 600 plates, 31,200 holes, an hour

up, the rotation being one-third of a revolution per cycle on head, or 3 1-3 r.p.m. A two cluster special head having 26 spindles each, is employed, as shown, Forced lubrication is provided both in the gear box on top of the column and also in gear chest on the reciprocating head. Oil is prevented from running down on the spindles by a special construction. Drilling compound is delivered by pump directly to the center of the table.

The drive is through an automobile-type dry-disk clutch at the top of the column and controlled by the foot lever shown at the bottom. The weight of the machine is 2450 lb. It is designated as the No. 12 automatic countersinking machine.

The safety trophy awarded by the Carnegie Steel Co. to the plant making the best showing in accident prevention each month, was won by the Edgar Thomson works, Braddock, Pa., for the month of July. The plant had no lost time accidents during the month.

Plans of the Coast Range Steel Co.

The Coast Range Steel Co., Vancouver, B. C., has been given support by the British Columbia government to the extent of a legislative measure guaranteeing one-third of the company's bonds. In return the company proposes to construct a blast furnace plant within 18 months, to have a capacity of 500 tons per day. It is also proposed to erect a large steel plant later. Industrial men in British Columbia anticipate that the establishment of a steel industry in the Province will make it possible to produce a wide variety of finished products at a cost that will enable the company to take care of both local and export business. H. J. Landahl, a member of the deputation that waited on the Provincial Cabinet seeking Government support for the proposed industry, made the following statement:

"We have already been assured by the advisory committee, under the Trade Facilities Act, of Imperial Government support for one-third of our proposed issue of $10,500,000. We have been assured by the Dominion Government that it will do its part. We now have the Provincial Government assuring us of the remaining third. The money awaits us in London, conditional only upon our receiving these assurances. We can now go ahead."

Mr. Landahl further stated that the company has rich ore deposits in the province, and that behind the organization are the skill and experience of three of the greatest iron, steel and coke oven firms in the British Empire. "These three firms have undertaken to come into British Columbia and build up an iron and steel industry," he said. "The plant will be erected under the direction of Vickers, Ltd., as the company's technical adviser. The furnaces and ovens will be manufactured by Simon Carves, Ltd., builder of furnaces and coke oven plants. The steel mills which are to follow in the course of the next few years will be built by the Wellman-Smith-Owen Engineering Co. These arrangements have already been made and it was this information the company laid before the legislature."

Algoma Steel Corporation Activities

TORONTO, Aug. 21.—Wilfrid H. Cunningham, of Philadelphia, president of the Lake Superior Corporation, Sault Ste. Marie, Ont., while passing through Toronto on his way to the Soo to make the annual inspection of the company's plant, stated that business was fair with the Algoma Steel Corporation. Its rail mills are running to capacity on orders received from the Canadian Pacific Railway and the mills have plenty of coal on hand to complete all existing business. Regarding future business, Mr. Cunningham said all depends on coal supply. The plant to-day has some 60 days' supply on hand and a little more coming in, with some more arranged for. It was very doubtful, however, whether the mills would accept any big orders offering for spot delivery, until the coal situation clarified. The small work mills are operating at a fair rate, though more or less on hand to mouth orders.

Will Open Fluorspar Mine

The Webber-Wood Spar Mining Co., 911 Third Street, Eldorado, Ill., recently incorporated with $50,000 capital stock, will soon open a fluorspar mine on land which the company owns five miles from Rosiclaire, Ill. A force is now at work cutting through the vein to determine how much fluorspar is available. Until this has been ascertained, no mining machinery will be purchased. Officers are C. E. Webber, president; D. L. Wood, vice-president; W. E. Troutman, second vice-president; Charles Burks, secretary-treasurer.

Haverstick & Co., steam and mill supplies, Rochester, N. Y., have entered on a program of large expansion of their business. A new concrete warehouse, pipe and machine shop, with private railroad siding, is now in course of construction, at an expenditure of $100,000 and will be ready for occupancy about Jan. 1. The following men have been added to the sales organization: Jas. C. Bashford, Victor C. Bassage, W. D. Hasley, H. A. Hopkins, R. Richardson, A. M. Seymour.

STEEL TREATERS' CONVENTION

Program for October Meeting and Exhibition in Detroit—Drop Forgers to Join

Final arrangements are being made for the fourth international steel exposition and conventions of the American Society for Steel Treating and the American Drop Forging Institute to be held in the General Motors Building, Detroit, Oct. 2 to 7. The exposition will be the largest of the kind ever held, as 99 per cent of the floor space has been sold and many exhibitors who desired to be present will be unable to be accommodated. There will be quite a number of exhibitors who have not been present at previous shows because the drop forging institute is holding its annual convention simultaneously and in the same building with the American Society for Steel Treating, and many members of the Drop Forging Supply Association are accepting the opportunity to exhibit.

The General Motors Building is especially adapted for exhibition purposes. In the large exhibition hall there are 30,000 sq. ft., while the two wings on the same floor leading to the exhibition hall have 20,000 additional square feet of display space. Arrangements have been made so that in one section of the hall gas furnaces will be in operation, while electrical furnaces and other equipment requiring power will be displayed throughout the hall. Practically all of the exhibits will be in operation.

At the three previous expositions held at Chicago, Philadelphia and Indianapolis, the attendance has been in excess of 10,000 and it is expected that because of the great interest in Detroit as a heat treating center as well as a market for steel productions the attendance will be in excess of 15,000. The railroads have granted fare and one-half for the round trip to Detroit on account of the conventions.

The following tentative program is announced:

Monday, Oct. 2

2 p. m.—Opening session; L. A. Danse, chairman:
Address of welcome, L. A. Danse; welcome to Detroit, Mayor Cousins; response, President F. P. Gilligan; report of tellers, C. G. Shontz; report of national secretary, W. H. Eisenman; report of treasurer, J. V. Emmons; president's address, F. P. Gilligan.

Tuesday, Oct. 3

10 a. m.—Carburizing session:
"Carburizing and Decarburizing in Case Hardening," by H. B. Knowlton.
"Case Hardening," by A. H. d'Arcambal.
"Irregularities in Case Hardened Work Caused by Improperly Made Steel," by E. W. Ehn.
"Some Features of Industrial Heat Treating Electrically," by C. L. Ipsen.

2 p. m.—Delegate session; chairman, T. D. Lynch; vice-chairman, A. W. F. Greene:
"The Mining and Metallurgy of Nickel" (illustrated), by A. J. Wadhams.

4 p. m.—Symposium on metallurgical education: "Not How but What to Teach."

4 p. m.—Practical round table discussion on heat treating; H. J. Lawson, chairman.

9:30 p. m.—Smoker and entertainment in auditorium, General Motors Building.

Wednesday, Oct. 4

10 a. m.—General heat treating problems:
"Heat Treating in Lead," by R. B. Schwenk.
"Furnace Atmospheres and Their Relation to Formation of Scale," by G. C. McCormack.
Paper by J. H. Nelson.
"Thermal Transformation of Some Chrome-Vanadium Steels," by J. S. Vanick.
"Heat Treating of Auto Springs," by A. E. Fuller.

2 p. m.—American Drop Forge Institute session:
The papers presented by the American Drop Forging Institute will be of interest and practical value to the forging industry.

4 p. m.—Practical round table discussion on heat treating; chairman, John Halbing.

9 p. m.—Carnival, frolic and dance; auditorium, General Motors Building.

Thursday, Oct. 5

10 a. m.—Tool steel session:
"The Uses and Abuses of Tool Steels from the Standpoint of the Producer and Consumer," by W. P. Woodside.
Paper by A. E. White.
"Effects of Structure upon Machining of Tool Steel," by J. V. Emmons.
"A Metallographic Study of Hollow Drill Steel," by N. B. Hoffman.

2 p. m.:
"Some Failures in Aircraft Plane and Engine Parts," by J. B. Johnson.
Paper by H. J. French.
Paper by F. M. Nair.
"Deterioration of Steel and Wrought Iron in Hot Gaseous Ammonia," by J. S. Vanick.

4 p. m.—Practical round table discussion on heat treating problems; Robert Vincent, chairman.

7 p. m.—Annual banquet of American Society for Steel Treating and American Drop Forging Institute; ball room, Statler Hotel.

Friday, Oct. 6

10 a. m.:
"Heat Treatment and Properties of Duralumin," by H. C. Kneer.

10:45 a. m.—Meeting of Standards Committee of American Society for Steel Treating; T. D. Lynch, chairman.

10:45 a. m.—"Modern Methods in the Manufacture of Steel," moving pictures.

2 p. m.—Research session; A. E. White, chairman:
"Governmental Research," by W. M. Corse.
"Research on Activities of Technical Societies," by A. D. Flinn.
"The Research Laboratory," by F. O. Clements.
"The Executive and Research," by Dr. John A. Mathews.

Plant Visitation

W. B. Hurley, chairman of the plant visitation committee, is making arrangements for the visitation of the following plants: Ford Motor Co., Highland Park and River Rouge Plants; Cadillac Motor Car Co., Central Forge & Gear Co., Lincoln Motor Car Co., Detroit Steel Products Co., Detroit Twist Drill Co. and Hudson Motor Car Co.

There will be two sessions of plant visitations each day, both of them starting from the General Motors Building, the morning trip at 10 and the afternoon trip at 2.

Symposium on Metallurgical Education

Owing to the requests from many members of the American Society for Steel Treating in the teaching profession that an opportunity should be given them to have a conference with metallurgical engineers who are engaged in commercial industries so that the universities and colleges might better prepare their students for the greatest usefullness, a symposium on metallurgical education has been placed on the program of the convention of the steel treaters.

Prof. S. L. Goodale, Carnegie Institute of Technology, will be chairman of the session, while others contributing to the symposium will be Howard J. Stagg, assistant manager Halcomb Steel Co.; H. B. Knowlton, central continuation school, Milwaukee; Prof. John Keller, iron and steel extension department of Purdue University; Prof. H. M. Boylston, professor of metallurgy, Case School of Applied Science; Dr. N. B. Hoffman, metallurgist Colonial Steel Co.; Mr. McCleary, metallurgist Dodge Motor Car Co.; Dr. John A. Mathews, president Crucible Steel Co. of America; Prof. O. A. Knight, State College, Pa.; Prof. Frederick Crabtree, Carnegie Institute of Technology, and Dr. C. M. Johnson, Crucible Steel Co. of America.

This symposium is the first of its kind and is expected to be productive of desirable results and to be a regular feature of the future conventions of the American Society for Steel Treating.

Symposium on Hardness Testing

The hardness testing committee of the National Research Council will hold an important symposium during the convention. The symposium will be in charge of Major A. E. Bellis, formerly metallurgist, U. S. Armory, Springfield, and at present president, Bellis Heat Treating Co., New Haven, Conn. The program follows:

"Object of Committees, Investigation and Questionnaire,"

by Major A. E. Bellis, chairman of hardness testing committee.

"Significance of Hardness Tests," by Dr. H. P. Hollnagel, General Electric Co.

"Hardness and Its Relation to Magnetic Properties," by Prof. R. S. Williams, Oberlin College, Oberlin, Ohio.

"Discussion of Methods of Hardness Testing."

At the annual banquet of both societies C. F. Kettering, president Dayton Engineering Laboratories Co. and a member of the American Society for Steel Treating since its organization, will serve as toastmaster. President Burton of the University of Michigan, one of the best dinner speakers in the country, will address the banqueters. There will be other speakers of national prominence, including the Governor of Michigan and some chief executives of the largest steel companies in the country. The number of banqueters will be limited to 1000.

Entertainment

Extensive plans have been made by the Detroit chapter for the entertainment of members and guests. Monday evening, Oct. 2, has been left open in order that the visitors may have the opportunity to thoroughly study the exhibits which will be open nearly every evening as well as each day. On Tuesday evening, Oct. 3, beginning at 9.30, Frank G. Davis, chairman of the entertainment committee, with the assistance of the Detroit chapter, will give a smoker in the large auditorium of the General Motors Building. Extensive plans and arrangements are being made which promises to eclipse everything that has ever been offered to the members of the society.

On Wednesday evening, Oct. 4, beginning at 9 in the main auditorium of the General Motors Building, the Detroit chapter will hold a carnival, frolic and dance for the members of the Society and their guests. All of the entertainment features of the carnival as well as the necessary adjuncts for a joyous frolic will be on hand and the local committee is sparing no expense to make this event one long to be remembered by those fortunate enough to be able to attend. On Thursday evening, Oct. 5, is scheduled the annual banquet at the Statler Hotel.

METAL TRADES CONFERENCE

Branch Secretaries Hold Their Semi-Annual Meeting at Milwaukee

All but four of the twenty-four local branch secretaries of the National Metal Trades Association met on Aug. 16 and 17 at the Milwaukee (Wis.) Athletic Club for their semi-annual conference. In opening the meeting, W. W. Coleman, Bucyrus Co., president of the national association, gave an interesting review of the political history of Milwaukee and Wisconsin. He pointed out that immigrants of a radical and socialistic tendency were in the majority among the early settlers. At one time a bill was introduced in the State legislature which required that all property be divided every Saturday, or oftener if necessary. It was defeated.

Some of the visiting secretaries were surprised to learn that for many years the metal trades have predominated in the industrial activity of Milwaukee instead of the brewing industry.

Papers on various phases of their work were discussed by the secretaries. These included "An Up-to-Date Employment Bureau," by Chester M. Culver; "Objections to Legislation Favoring Unemployment and Health Insurance and Old Age Pensions," by J. M. Manly; "Experience of the Grand Rapids Branch of the National Metal Trades Association with Its Mutual Workmen's Compensation Insurance Bureau," by A. W. Blodgett; "Comparative Wage Schedules," by W. J. Cronin; "What is 'Normal,'" by Lewis Atherton; "Legislation," by H. A. Jansen; "Superintendents' and Foremen's Clubs," by Paul Blatchford; "Need and Value of Economic Education of Employees," by Donald Tulloch, and "Turnover—Causes and Remedy," by T. F. Silkman.

A committee was appointed by Chairman Fairbairn to devise a more comprehensive comparative statement of wages paid in the various localities, than that which has been issued for some time by the local branches and the national office of the association.

The result of the survey recently completed by the association in regard to industrial betterment work was presented in tabulated form.

H. J. Wiegand, Cutler-Hammer Co., who is president of the Milwaukee branch; Commissioner Sayre, Councilor Hibbard and Secretary Fischer of the National Metal Trades Association and some ten secretaries of allied associations; J. B. Doan, American Tool Works Co., Cincinnati; Paul T. Norton, Case Crane & Engineering Co., Columbus, Ohio, and J. W. O'Leary, Arthur J. O'Leary & Son Co., Chicago—the last three being members of the executive committee of the national association—attended the meeting.

American Electrochemical Society's Fall Meeting

Final arrangements for the forty-second general meeting of the American Electrochemical Society, at Montreal, Que., Sept. 21, 22 and 23, are being made. The technical program for Thursday, Sept. 21, will include papers on electrolysis and electroplating. The recently organized division on electrodeposition (G. B. Hogaboom, chairman; William Blum, secretary) will be well represented and take active part in the discussion. One of the papers will deal with the physical properties of electrolytic iron. There will also be papers on zinc, brass, and other electro deposited metals.

On Thursday afternoon and Friday morning, a symposium on "Industrial Heating" will be in progress. The electrothermic division (Bradley Stoughton, chairman; Colin G. Fink, secretary) which held a successful symposium on "Electric Cast Iron" at the Baltimore meeting, in April, will again be in charge. Twelve papers especially prepared for this session and dwelling on industrial heating in electric furnaces, will cover history of industrial heating; principles of design of furnaces; comparison of fuel costs in different types of electric furnaces, and with combustion furnaces (in this connection, electric energy would be estimated as a "fuel cost"); resistor materials; specific heats; electric conductivity of insulating materials at industrial furnace temperatures; heat emissivity, and heat transfer.

There will be an excursion to Shawinigan Falls to inspect the various industrial plants of one of the most interesting centers on the continent. A popular lecture on the "Progress in Physical Science" is scheduled for Thursday evening. Section Q will be in charge of an old-fashioned smoker on Friday evening. The headquarters for this meeting will be the Hotel Windsor.

International Chamber of Commerce

The second general meeting of the International Chamber of Commerce will be held in Rome, Italy, March 18-24, 1923. Present indications are that there will be from 200 to 300 American business men in attendance. Among those who have made reservations on the Steamship Caronia for the cruise organized by the American Section for the meeting are:

A. C. Bedford, chairman Standard Oil Co., New Jersey, 26 Broadway, New York; Julius H. Barnes, president Barnes-Ames Co., 42 Broadway, New York; William Butterworth, president Deere & Co., Moline, Ill.; Edward N. Hurley, Hurley Machine Co., Chicago, formerly Chairman United States Shipping Board; R. P. Lamont, president American Steel Foundries, Chicago; and Clarence H. Howard, president Commonwealth Steel Co., St. Louis.

General Resumption of Mining Is Probable

Decided Change Comes Suddenly in the Pittsburgh District —Signing of the Cleveland Agreement Is Now Expected

PITTSBURGH, Aug. 22.—A marked change has developed in the past 24 hours with regard to the prospect of a settlement of the coal strike. It is now believed that a general resumption of bituminous coal mining will come within the next few days. Even as recently as yesterday the thought was that coal operators representing the great bulk of the tonnage in this and nearby fields would continue to hold out against signing the agreement reached last week in Cleveland, but to-day has brought definite signs of a break in the ranks of these operators and the general feeling is that before the week ends the Cleveland terms will be accepted by practically all of the producers who hitherto have operated under agreement with the unions.

Disappointment is felt in a good many quarters over the sudden change in the situation since it apparently spells a victory for the union miners and some express the view that it merely means the postponing of a definite settlement until next spring when a new agreement will have to be negotiated.

The H. C. Frick Coke Co. to-day posted a notice restoring the Sept. 1, 1920, wage scales in the Connellsville district except on common labor, which goes to $3.60 per day of nine hours, as compared with $5.40 per day in the 1920 scale. This class of labor lately has been getting $3 per day and the increase figures out exactly 20 per cent, the same increase which the Steel Corporation will make in the steel mills effective Sept. 1. The increase in the wages of the coal miners and coke oven operators goes into effect to-morrow, and the scale of inside mine labor, which has been from $5 to $5.05, now goes to $7.50 to $7.55.

The one favorable development in connection with the coal strike, from the standpoint of the steel industry here, is that the largest gains in production have been in the Connellsville district, where so many of the steel companies have their own mines. The failure of the union leaders at the Cleveland meeting to give consideration or recognition to those in the non-union fields that joined the union during the strike convinced these men that they have not been fairly dealt with and they have been showing considerable anxiety lately to get back to work. The H. C. Frick Coke Co., a Steel Corporation mining subsidiary in the Connellsville district, has benefited particularly as a result of this change in the attitude of the men.

The Pittsburgh Coal Producers' Association, the Freeport Thick Vein Operators' Association, the Northern West Virginia Coal Producers' Association, and the operators in the Kanawha, W. Va., district and in the Cumberland, Md., district all have had the Cleveland agreement before them for consideration, and all of them so far have refused to sign, but may do so. The Cumberland operators announced that they would pay the scale in effect prior to the strike, but in taking this action they emphasized that it did not carry with it recognition of the union or a continuance of the check-off scheme.

Desperate Efforts of Union Leaders

UNIONTOWN, PA., Aug. 19.—Production in the Connellsville bituminous region continues to increase with a larger number of workmen manning plants in the territory. The Monongahela division, Pennsylvania Railroad, today placed cars at 12 plants on the division which, it is said, will resume work on Monday morning after an idleness since last April 1.

A gain of some 500 cars in the week's shipments over shipments for the preceding week out of the region is indicated in estimates available here this evening.

It is estimated that between 150 and 200 men are being imported into the region every 48 hours. Operators, it is understood, have given their former employees their last opportunity to return to work. Failure to comply will result in immediate evictions and the placing of new workmen in the homes.

Desperate efforts are being made by union leaders in the Connellsville region to hold their men in line while other union workers go back to work in the union fields. Outwardly, the union men in the region seem more determined than ever. Under the surface, however, a far different condition exists. There is a pretty general feeling that the union is preparing to throw overboard the Connellsville miners who struck out of sympathy with the union men and then affiliated themselves with the union. That these men are asking questions was indicated in a statement issued over the signature of William Feeney and three other union leaders in which they declared that the "full support" of the union would be placed back of the men in this region until they win their fight. What this "full support" is was not stated. Most observers believe there will be a break in the union ranks within the next fortnight or so unless the union extends material assistance in the way of financial benefits and commissary. The strikers in the region are continuing their solicitations for help throughout the county, but are not getting very much support. The answer to their appeal usually is "go back to work and earn the money you need." The strike is almost wholly lacking in public support in the county.

Reports that there would be an increase in wages in the region were spread during the week. These were effectually suppressed by operators. The position of the operators is unmistakable. The mines will be operated under the present scale and there will be no recognition of the union. Developments during the week have served to emphasize this stand by the operators.

May Reduce Number of Foreigners

New phases in the labor situation are developing which are being watched with great interest by those involved in the industrial development of the region. Stories were published during the week that a large element of the foreign population in the region would be weeded out in the return to operating normalcy and would be replaced by men being brought into the region. The majority of the men imported are Americans and negroes. One large company alone brought in 350 new men in three days.

Just to what extent the alien workers in the region will be eliminated remains to be seen. A large part of the responsibility of the strike in the region, in the opinion of observers, may be charged to activities of certain alien organizations. These activities have been brought formally to the attention of the Department of Justice and an investigation is under way, although the department hesitated to proceed, it is stated, for a time until the facts were more elaborately presented. The demand for action was taken to the Federal department by the new Fayette County Operators' Association.

No specific alien organizations have been named and no specific foreign group is charged with these activities in the absence of complete investigation by Federal officials.

There is a growing sentiment against the influx of

colored workmen. In some labor groups there is a tendency to demand that the men who have joined the union recognize the fact that they have lost the fight for the organization of the region and return to work in order to prevent a further influx of workers.

The whole situation is one of watchful waiting. The operators, for the most part, are proceeding with efforts to return to normal operation. Especially is this true of the H. C. Frick Coke Co., which is now operating at around 40 per cent.

Further Recessions in the Mahoning Valley

YOUNGSTOWN, Aug. 22.—Though operating schedules of Valley iron and steel interests continue to show recessions, makers express hope that the low point in the current movement has been reached, and the next change of consequence will be upward. Plants are operating on a narrow margin of coal, but it is expected additional suspensions will be largely averted.

The Youngstown Sheet & Tube Co. has suspended the third blast furnace in its East Youngstown complement, leaving but three independent stacks pouring in the Mahoning and Shenango Valleys, and nine furnaces of the Carnegie Steel Co., five at the Ohio Works, Youngstown, and four at New Castle, Pa. The Brier Hill Steel Co. and the Republic Iron & Steel Co. are each operating one furnace.

The Bessemer department of the Sheet & Tube company is scheduled for three days' production this week, when it will become idle. One merchant bar mill and one skelp mill, which were active last week at the Sheet & Tube property, are down, while schedules of the Republic company provide for one less bar mill at the Brown-Bonnell works.

The Girard plant of the A. M. Byers Co., Pittsburgh, producer of wrought iron pipe, is wholly idle.

While 106 sheet mills are scheduled by Valley interests, the actual operating number is somewhat less, varying from day to day, and dependent upon labor supply. Last week, for instance, schedules met serious interruption because of the hot wave which engulfed Middle Western States, causing many hot mill workers to desert the rolls.

Of the 51 independent open-hearth furnaces in the Mahoning Valley, 33 are charged. Fabricators are short on some steel supplies, their stocks being unbalanced, but their production is largely unaffected.

Aside from the suspension of its blast furnace, the Trumbull Steel Co. has met with little interference to its activity. The company is maintaining its open-hearth department and finishing mills at a normal rate.

Schedules of the principal Valley interests, for the week of Aug. 21, are:

Youngstown Sheet & Tube Co.—One blast furnace, six open hearths, Bessemer three days, two blooming and bar mills, three skelp mills, nine pipe furnaces, 14 sheet mills, and partial wire, rod and conduit operations.

Republic Iron & Steel Co.—One blast furnace, eight open hearths, one blooming and one bar mill, one skelp mill, four pipe furnaces, three merchant bar mills and 16 sheet mills at the Niles plant.

Brier Hill Steel Co.—One blast furnace, seven open hearths, blooming and bar mills, both plate mills and 28 sheet mills scheduled.

Trumbull Steel Co.—Seven open hearths, blooming and bar mills, three strip mills and 44 sheet and tin plate mills.

Sharon Steel Hoop Co.—Five open hearths, blooming and bar complements, nine sheet and four strip mills.

Carnegie Steel Co.—Ohio Works, 90 per cent; Upper Union Works, normal; Lower Union Works, idle; McDonald bar mills at 90 per cent.

Serious Shortage in Copper Country Feared

DETROIT, Aug. 19.—The Lake Superior copper country, including the properties of the Calumet & Hecla Mining Co., is facing the prospect of a fuelless winter and consequent suspension of operations, according to information which has come to the office of the Michigan Manufacturers' Association in Detroit. Practically all coal used in both the copper and iron ore mines of the upper peninsula of the State is shipped by boat from Lake Erie ports and as less than 3,000,000 tons of the 8,000,000 annually required at upper lake ports has gone forward this season, this represents proportionately what the fuel situation is in the mining region of the State which is included in the "head of the lakes" area.

Because of the fact that the copper mines have been closed during the last two years due to market and labor conditions, only reopening during the last spring and summer, the prospect of another enforced shutdown at a time when market conditions are constantly improving is causing considerable anxiety among both operators and workers. A shut-down of the Michigan mines would have a far reaching effect in the industry, as the State ranks third in copper production, with a normal output of between 150,000,000 and 200,000,000 pounds.

Federal Fuel Administrator Spencer, at Washington, has given assurance that increased shipments of coal would be consigned to the head of the lakes while the season of navigation is open, but current shipments are far from sufficient to preclude the possibility of a large shortage.

Grover C. Good, of the Globe Knitting Co., Grand Rapids, has been named chief of the manufacturers' division of the State Fuel Administration office. He will serve as chairman of a committee of manufacturers named by the Michigan Manufacturers' Association which will devote its time to the task of procuring enough fuel to keep as many industries of the State going as is possible.

The industries of Michigan have contracts with the coal mine companies which not a few have declared they will not permit to be broken. They contend that there is no existing Federal or State legislation authorizing the priority rules laid down by the Federal fuel office whereby certain industries may be classed as non-essential in the distribution of coal and they declare that they will hold railroads liable for damages in the event coal loaded at the mines, in compliance with contracts, is shipped elsewhere. The Chesapeake & Ohio Railroad, over which much of Michigan's industrial fuel is shipped, has taken the stand that all fuel consigned to its lines will be delivered to consignees regardless of priority orders to the contrary, so far as it is able to handle such shipments.

Survey of Fuel Conditions

John L. Lovett, managing director of the Michigan Manufacturers' Association, representing 1200 industrial firms, with approximately 500,000 employees, is completing a questionnaire to determine the amount of fuel on hand for industrial purposes. Out of the 1200 forms sent out, about 400 have been returned showing a surplus of 250,000 tons for those industries reporting. This is equivalent to a 30 days' supply, on the average. Fully 90 per cent of the industries of Michigan are almost exclusive users of power furnished by the two largest public utilities of the State, the Detroit Edison Co. and the Consumers' Power Co.

Effects of the coal shortage are beginning to be reflected in the closing of some of the smaller factories and the suspension of work in certain departments of the larger plants. Two of the largest motor car factories in Detroit are running with less than a week's supply of coal ahead. Suspension of these two plants alone would throw 50,000 to 60,000 men out of employment.

Railroad bidding for coal in the open market has created a runaway market in the Detroit area, $12 and $15 a ton frequently being paid speculators who are in some unexplained manner obtaining large shipments while the State Fuel Administration reports that practically no so-called priority coal has been shipped to

Michigan because of the fact that such orders have not been accompanied by guarantees of payment as required by the Federal Administration.

Motor car manufacturers have been forced generally to curtail operations owing to their inability to obtain freight cars for both in and out bound shipments. Body makers report considerable difficulty in obtaining sheet metal. Most of the factories are using motor trucks between Detroit, Chicago, Cleveland, Toledo and other nearby parts producing centers in obtaining materials which the railroads have been unable to move. These truck shipments, however, are confined to smaller parts. Inventories are at a very low mark owing to the fact that manufacturers, this season, have been wary of again being caught with huge supplies on hand as they were last year when prices began tumbling.

The Employers' Association of Detroit reports a gain of 812 in employment among 79 firms reporting during the current week. The total this week is 182,545.

British Miners' Reaction to Supplying Coal to America

In connection with American coal orders placed in England and Wales, the miners in the Rhondda district have passed a resolution requesting the South Wales executive council to take steps to prevent the coal from being supplied, as its shipment would tend to break the strike of the American miners. This resolution has been referred, by the executive council, to the International Miners' Committee.

It is also questioned whether the coal-loading docks are equal to the demands made upon them by the rush of American orders. This has resulted in some discussion favoring the three-shift system of working at the docks, but it is reported unlikely that such a step will be taken. It is regarded as possibly opening the door to labor trouble, and the railroad and dock interests are both opposed to it, especially as the present two-shifts (each of 8 hr. actual work) are reported giving results considered satisfactory.

Washington More Optimistic

WASHINGTON, Aug. 22.—Negotiations between miners and operators during the past week have brought about additional production of bituminous coal at the rate of approximately 85,000,000 tons per year, and it is now estimated that the total output is at the rate of about 285,000,000 tons, against a normal output placed at 550,000,000 tons. This has given a tone of optimism to the coal strike situation, enhanced by the gradual reopening of fields that have followed one after another such as in southern Ohio, sections of Virginia, West Virginia, and Kentucky, with the hope that other settlements are on the verge of being put into effect so as to reopen all of the fields, especially in Pennsylvania. It also is believed the anthracite strike is about to be settled and output resumed in the near future.

The railroad strike is to be the subject of a further parley in New York on Wednesday of this week, and while administration circles which are closely following negotiations between railroad executives and representatives of the brotherhood as "mediators," a more cautious tone has been adopted as to their outcome. At the same time officials profess to believe that a settlement of the seniority right issue is near at hand. It is recalled, however, that a number of favorable predictions have failed to materialize, and for that reason forecasts are made with considerable circumspection.

It is reported that 60 car-loads of Russian manganese a day are shipped from Tchiatouri, Georgia, and transhipped in Shorapani, where the loading is delayed owing to a lack of cars. Preliminary work is going on at Tchiatouri for the exploitation of further mines, which causes an influx of workmen.

LOWER COAL PRICES

Valley Manufacturers Obtain Some Relief—Pipe Inquiry Is Active

YOUNGSTOWN, Aug. 22.—Firmer steel demand is reported by Valley makers, with price advances becoming applicable on sheets, pipe, bars, plates and wire products. While coal prices are perceptibly softening, producers do not look for a restoration of prices existing prior to July 1 for some time. Pennsylvania coal is now purchasable at $6.50, in comparison with recent maximums of $8 and $9, and industrial consumers believe that further reductions impend which will bring coal down to a $5 base price for the time being.

Coal supply continues to be the dominating influence in the market. Larger tonnages are coming into the Valleys from the Connellsville district, but railroad congestion is still holding up supplies from the West Virginia, Kentucky and Tennessee fields.

Pipe makers report more active inquiry for lapweld sizes, with substantial unfilled commitments on buttweld sizes. The Republic company is operating three lapweld units and one buttweld mill. Line pipe and oil country goods are in active demand.

One Valley interest has made substantial purchases of Bessemer steel lately, getting some tonnage from a Steel Corporation subsidiary and some from an independent maker at Pittsburgh. The $35 quotation on semi-finished material is now only nominal, applying simply to contract business. Where new tonnage may be placed, it is necessary to pay from $2 to $3 more per ton.

Sheet production has been affected very little by the current strikes. Price advance by the American Sheet & Tin Plate Co. on fourth quarter business strengthens the position of those independents which have been quoting from 2.50c. to 2.60c. for blue annealed; 3.30c. to 3.40c. for black and 4.30c. to 4.40c. for galvanized.

Strip demand from the automobile industry is maintaining production in this direction, with prices firm. Hot-rolled strips range from 2.50c. to 2.75c. The Ford Motor Co. is absorbing large tonnages produced in the Valleys.

The Brier Hill Steel Co. has been entering some important plate business and both its 84-in. and 132-in. mills are working off tonnages. Fabricating interests and tank builders are the principal factors in the market. One boiler and tank interest in the Valley, which recently enlarged its capacity, is operating day and night shifts.

Automobile Production High

Reports to the National Automobile Chamber of Commerce indicate that July production of passenger cars and trucks approximated 246,600, compared with the high record of 288,000 in June. This is the highest July in the history of the industry, exceeding July, 1921, by 39 per cent and July, 1920, the best previous July, by 20 per cent. "The July record," says *Automotive Industries*, "brings total production for the year up to 1,403,000 cars and indicates that 1922 will be the industry's greatest year—unless the railroad and coal strike situation exerts a serious curtailing influence on manufacturing activities for the rest of the year."

The St. Louis Coke & Chemical Co., Granite City, Ill., has completed a 17-in. gas line which takes surplus gas from its blast furnace to a gas holder at the nearby Roberts coke oven plant for use at the ovens. A gas washing plant has also been built at the blast furnace. At the coke ovens, a Schuette and Koerting blower is used, having a capacity of 500,000 cu. ft. of gas per hour.

The plant of the Ohio Steel Products Co., Mineral Ridge, Ohio, which has been shut down for about 18 months, will be offered for sale shortly. The company was organized with a capital stock of $500,000, $300,000 of which has been issued and engaged in the manufacture of conduit tubing and other steel products.

COST OF THE THREE-SHIFT DAY

Canvass Being Made of Iron and Steel Manufacturers to Determine What the Increase Will Be

The committee of the American Iron and Steel Institute appointed after the conference with President Harding in May to deal with the problem of the 12-hour day in the iron and steel industry is making a thorough canvass of the situation preparatory to making its report in the coming fall. In gathering facts the committee is carrying its inquiry into all branches of the industry, and all producers of pig iron, steel ingots and semi-finished and finished steel products are being asked to contribute information.

The questionnaire adopted, as will be seen in the data sheet on the following page, goes thoroughly into the problem. The aim is to get complete statistics of the present distribution of forces in respect to 8-hour and 12-hour shifts, also of the number of workers whose day is 10 hours, as in the case of machinists, molders, electrical workers and workers in other trades tributary to mill operations.

The manufacturers are asked to indicate what percentage of hourly wage advance would be necessary in their opinion to compensate for the fewer hours' pay under the three-shift plan. They are also asked to indicate what the increase in their annual pay roll would be, assuming that the hourly rate of pay is increased 50 per cent under a change from 12-hour to 8-hour turns. Calculations are also to be made indicating the increased cost per ton of all products under a change from 12-hour to 8-hour shifts.

TRIBUTE TO CALVIN W. RICE

A Mission to the Congress in Brazil as Representative of American Engineers

Calvin W. Rice, secretary of the American Society of Mechanical Engineers, was the guest of honor at a dinner given at the Engineers' Club in New York, Monday evening, Aug. 21, marking his departure for the engineering congress in connection with the International Exposition which opens at Rio de Janeiro, Brazil, on Sept. 9. Mr. Rice was selected for this mission by the council of the American Society of Mechanical Engineers. He sails from New York on Aug. 24 on the steamer Pan-America, which will convey Secretary of State Charles E. Hughes and party to the Brazilian capital.

The dinner of Monday evening was attended by about 50 members of the various engineering societies, including a number of presidents and past presidents, and was presided over by J. W. Lieb, vice-president of the New York Edison Co. The speakers, in addition to Mr. Lieb, were Dean Dexter S. Kimball, Ambrose Swasey, J. V. Davies, Charles F. Rand, John R. Freeman, A. R. Ledoux, Gano Dunn and E. J. Mehren. Much was said in tribute to Mr. Rice's talents as a diplomat and in recognition of the marked accomplishment of his 16 years in the secretaryship of the mechanical engineers. It was brought out that Mr. Rice had steadily worked for a larger place for the engineer in American life, and had achieved much in the furtherance of closer international relations among engineering organizations. In the United States, through a national net work of local sections, professional divisions, and administrative committees, the combined engineering societies have enlisted the co-operation of nearly 200,000 members. Always the aim had been for an increasing contribution by the engineering profession to the public good.

Among them, the speakers pieced together noteworthy features of Mr. Rice's work, particular reference being made to his stay at Skibo Castle, when Andrew Carnegie's co-operation was secured in the plan for the erection of the engineering societies' building and that of the Engineers' Club, in New York, and to Mr. Rice's management of the visit of American mechanical engineers to Great Britain in 1910. Confidence was expressed that his mission to South America would bind more closely together the associated engineers of the two Americas, just as had been done by the mission of American engineers to Europe last year and by other efforts for closer co-operation in which Mr. Rice had been a prime mover. He was referred to as one who had succeeded well in the difficult role of servant to many masters; but another speaker, in the light of Mr. Rice's mastery of the art of getting others to work, thought it might more appropriately be said that he had been "served by many masters."

In addition to the American Society of Mechanical Engineers, Mr. Rice will represent at the congress at Rio the Federated American Engineering Societies, the American Institute of Electrical Engineers, the Engineering Foundation, the John Fritz Metal Board and the Engineering Division of the National Research Council. The American Institute of Mining and Metallurgical Engineers will be represented by Thomas T. Read, Bureau of Mines, Washington, and the American Society of Civil Engineers by Verne L. Havens, editor of *Ingenieria Internacional*, New York.

Mr. Rice, in addition to his work at the congress, will visit South American engineering centers in behalf of organized engineering. There are Latin American engineering societies at Montevideo, Buenos Aires, Santiago, Lima and Havana. In Buenos Aires, Santiago and Havana there are associations of members of American engineering societies and at Rio de Janeiro and Lima similar associations are being formed. Mr. Rice plans to return to New York about Nov. 10.

Purchases of Machine Tools

CHICAGO, Aug. 22.—The Union Pacific has closed for approximately $200,000 worth of machine tools. The list of this equipment has been pending for some time, having been published in THE IRON AGE of June 29.

The Illinois Central has also commenced to buy against its outstanding list of machine tools with the probability that purchases totaling $150,000 will be completed before the end of the week.

Wire Goods Makers Merge

The Wire Goods Co., Worcester, Mass., the Cassady-Fairbank Co., Chicago, and the Andrews Wire & Iron Co., Rockford, Ill. and Watford, Canada, have consolidated as a $1,000,000 corporation with headquarters at 28 Union St., Worcester. Several other concerns are involved, including the Ayres Mfg. Co., Pawtucket, R. I., and the Wood-Sherwood Co., Lowell, Mass. The new name will be the Washburn Co. The Wire Goods Co. was established in Worcester in 1880, while the Lowell, Mass., concern is the oldest making kitchenware in the country.

The officers of the new company are: Charles G. Washburn, president; Arthur C. Andrews, Rockford, Ill., Perry M. Shepard, Chicago, and William L. Walker, vice-presidents; Reginald Washburn, treasurer and general manager; Irving A. Green, secretary. The officers constitute the board of directors.

American Iron and Steel Institute—Data Sheet for Committee on Twelve-Hour Day

DEPARTMENTS	(A) Number of Employees	(B) Percent:	(C) If 12-Hour Day Eliminated, Number of Employees	(D) Increase ($) in annual pay roll based upon increasing hourly rate of wages ....% to compensate for the fewer hours worked and also based upon adjustment in wage of others to maintain differential. NOTE: Please fill in the percentage hourly wage advance which in your opinion would be necessary and base the figures in this column upon that advance.	(E) Increase ($) in annual pay roll based upon increasing hourly rate of wages 50% so that 12-hour men changed to 8 hours would receive the same daily wage and also based upon adjustment in wage of others to maintain differential. NOTE: Figures based upon this rate of wage increase are requested in order that the returns may be standardized and more easily compared.	(F) Increase in Cost: Dollars per G.T. From Column "D"	(G) Increase in Cost: Dollars per G.T. From Column "E"	(H) Total or Cumulative Increase in Cost: Dollars per G.T. From Columns "F" and "H"	(I) Total or Cumulative Increase in Cost: Dollars per G.T. From Columns "G" and "I"
COKE OVENS: 8-hr. Men									
Annual Capacity 10-hr. Men									
G. T. Over 10-hr. Men				Coke Ovens:	Coke Ovens:				
Total		100		$.....	$.....	Coke: $.....	Coke: $.....		
			..% Increase of Total:						
BLAST FURNACES: 8-hr. Men									
No. of Furnaces.... 10-hr. Men									
Annual Capacity Over 10-hr. Men				Blast Furnaces:	Blast Furnaces:	Pig Iron:	Pig Iron:	Pig Iron:	Pig Iron
G. T. Total		100		$.....	$.....	$..... (From Coke)	$..... (From Coke)	$.....	$....
			..% Increase of Total:						
PUDDLING FURNACES: 8-hr. Men									
Annual Capacity 10-hr Men.									
G. T. Over 10-hr. Men				Puddling Furnaces:	Puddling Furnaces:	Muck Bar:	Muck Bar:	Muck Bar:	Muck Bar:
Total		100		$.....	$.....	$.....	$.....	$.....	$
			..% Increase of Total:						
STEEL WORKS: 8-hr. Men									
No. of O. H. Fcs.... 10-hr. Men									
No. of Converters... Over 10-hr. Men				Steel Works:	Steel Works:	Slabs, Sheet Bars, Billets:	Slabs, Sheet Bars, Billets:	Slabs, Sheet Bars, Billets:	Slabs, Sheet Bars, Billets:
Annual Capacity						$.....	$.....	$.....	$.....
G. T. Total		100		$.....	$.....	(From Pig Iron)	(From Pig Iron)		
			..% Increase of Total:						
ROLLING MILLS:									
Structural: 8-hr. Men									
Annual Capacity 10-hr. Men									
G. T. Over 10-hr. Men				Structural Mills:	Structural Mills:	Structurals:	Structurals:	Structurals:	Structurals:
Total		100		$.....	$.....	$..... (From Semi-Fin)	$..... (From Semi-Fin)	$.....	$.....
			..% Increase of Total:						
Bar: 8-hr. Men									
Annual Capacity 10-hr. Men									
G. T. Over 10-hr. Men				Bar Mills:	Bar Mills:	Bars: $.....	Bars: $.....	Bars: $.....	Bars: $.....
Total		100		$.....	$.....	(From Semi-Fin)	(From Semi-Fin)		
			..% Increase of Total:						
Plate: 8-hr. Men									
Annual Capacity 10-hr. Men									
G. T. Over 10-hr. Men				Plate Mills:	Plate Mills:	Plates:	Plates:	Plates:	Plates:
Total		100		$.....	$.....	$..... (From Semi-Fin)	$..... (From Semi-Fin)	$.....	$.....
			..% Increase of Total:						
Rail: 8-hr. Men									
Annual Capacity 10-hr. Men									
G. T. Over 10-hr. Men				Rail Mills:	Rail Mills:	Rails:	Rails:	Rails:	Rails:
Total		100		$.....	$.....	$..... (From Semi-Fin)	$..... (From Semi-Fin)	$.....	$.....
			..% Increase of Total:						
Sheet: 8-hr. Men									
Annual Capacity 10-hr. Men									
G. T. Over 10-hr. Men				Sheet Mills:	Sheet Mills:	Sheets:	Sheets:	Sheets:	Sheets:
Total		100		$.....	$.....	$..... (From Semi-Fin)	$..... (From Semi-Fin)	$.....	$.....
			..% Increase of Total:						
Tin: 8-hr. Men									
Annual Capacity 10-hr. Men									
G. T. Over 10-hr. Men				Tin Mills:	Tin Mills:	Tin Plates:	Tin Plates:	Tin Plates:	Tin Plates:
Total		100		$.....	$.....	$..... (From Semi-Fin)	$..... (From Semi-Fin)	$.....	$.....
			..% Increase of Total:						
Tube: 8-hr. Men									
Annual Capacity 10-hr. Men									
G. T. Over 10-hr. Men				Tube Mills:	Tube Mills:	Tubes:	Tubes:	Tubes:	Tubes:
Total		100		$.....	$.....	$..... (From Semi-Fin)	$..... (From Semi-Fin)	$.....	$.....
			..% Increase of Total:						
All Other Depts.: 8-hr. Men									
10-hr. Men									
Over 10-hr. Men				All Other Depts.:	All Other Depts.:				
Total		100		$.....	$.....				
			..% Increase of Total:						
GRAND TOTAL				Grand Total:	Grand Total:				
			..% Increase of Grand Total:	$.....	$.....				

The total or cumulative costs of Cols. "H" and "I" should be obtained:—

For Pig Iron: by adding to the Pig Iron figures of Cols. "F" and "G" the proper prorated increase in Coke costs from Cols. "F" and "G."

For Semi-finished: by adding to the Semi-finished costs of Cols. "F" and "G" the proper prorated increase in Pig Iron costs from Cols. "H" and "I."

For finished material: by adding to the finished material costs of Cols. "F" and "G" the proper prorated increase in Semi-finished costs of Cols. "H" and "I."

N. B.—All figures to be based upon operating at full capacity.

IRON MAKERS PROTEST

Objections Made to Proposed Reduction on Pig Iron Rates from South

WASHINGTON, Aug. 22.—Blast furnace interests at Ashland, Ky.; Ironton, Jackson and Wellston, Ohio, and in the St. Louis, Mo.-Granite City, Ill., switching district have filed protests with the Interstate Commerce Commission against proposed reductions by Southern carriers in rates on pig iron from the Alabama district to Ohio River crossings. Contention is made by the protestants that the lowered rates from the Southern iron producing district will unduly prejudice them in the marketing of pig iron in the Ohio River and Northern markets. Representing the St. Louis-Granite City switching district interests, the St. Louis Coke & Chemical Co. claims that the Louisville & Nashville, Illinois Central, Southern, Mobile & Ohio and St. Louis-San Francisco railroads are participants in joint rates on pig iron from the St. Louis district to points reached under the rates from the Alabama furnaces, and that consequently these carriers are proposing to unjustly and directly discriminate against pig iron makers in the St. Louis district.

Meanwhile the Arrow Transportation Co., a river line serving Sheffield and Florence, Ala., with the Chicago, Burlington & Quincy railroad as a participant, has filed a tariff with the commission proposing an even greater reduction in rates on pig iron than that proposed by the all-rail carriers as pointed out by THE IRON AGE last week. The Arrow line and the Burlington Railroad propose to reduce, effective Sept. 15, the rate from Sheffield and Florence to Chicago from $4.98 to $4.18 per gross ton and the St. Louis rate from $3.85 to $3.28. It is proposed to establish these rates from the Arrow line rate of $1.96 to Metropolis, Ill., plus the divisions to be received by the Burlington from its connections south of the river on all-rail traffic by way of Metropolis. Its division to Chicago would be $2.22 and to St. Louis $1.32.

Attention is called by the Arrow lines to parts of decisions of the Commission in which it said the rail carriers should not charge carriers by water more for carrying the freight given to them by water lines than they charged for performing similar service for their rail connections.

It is believed that concurrence of the Burlington in the tariff of the Arrow line would put before the rail lines south of the Ohio the question as to whether they will bring their all-rail rates down to the point of actually meeting the rate made by the river line. The rate by the latter and the Burlington will be not quite 20 per cent under the all-rail rate to Chicago, 20 per cent less being generally regarded as giving the carrier by water an opportunity to compete with all-rail routes on terms of equality. Considerable interest is being shown in the possibility of the transfer of traffic at Metropolis, making it an important rate making route.

METAL TRADES WAGES ABROAD

Figures from England, France, Belgium and Germany Show Varying Trends

In Research Report No. 53, the National Industrial Conference Board presents a comprehensive view of the wage situation in Europe, tracing the principal changes in wages from the end of 1920 to the beginning of 1922. Some of the principal data covering the iron and steel industry are put into our tables.

In the heavy iron and steel trades of Great Britain recent wages show an excess over pre-war rates varying from 20 to 120 per cent, compared with 150 to 350 per cent at the end of 1920. In the tin plate and sheet steel trade in South Wales the net increase over pre-war rates now amounts to about 34 per cent, compared with a range of 150 to 231 per cent in December, 1920. The general conditions are shown by the table of sliding scales during 1921.

Percentage Increase Above "Standard"	Cleveland Blast Furnacemen	Steel Melters' Scale (England and Scotland) Basic	Acid
January, 1921	170¾	190	165
April, 1921	144	166¼	141
July, 1921	72¾	138¾	113¾
October, 1921	77¼	93¾	68¾
January, 1922	36	..	..
February, 1922	..	60	35
April, 1922	34½	..	..

At the beginning of 1922 certain standardized wage rates were in force in different sections of Great Britain, of which the following table is illustrative:

Weekly Rates in British Engineering Trades at Beginning of 1922

	From* £ s.		To† £ s.	
Turners, fitters, smiths	3 8½	($14.49)	5 3½	($21.90)
Millwrights	3 11½	(15.13)	5 3½	(21.90)
Pattern makers	3 10½	(14.91)	5 4	(22.00)
Coppersmiths	3 12½	(15.34)	4 15½	(20.20)
Brass finishers	3 12½	(15.34)	4 6	(18.19)
Planers, borers, slotters	3 3½	(13.43)	‡3 17½	(16.39)
Millers	3 3½	(13.43)	‡4 5¼	(18.03)
Die sinkers and press tool makers	3 12½	(15.34)	‡4 17	(20.52)
Electricians	3 10½	(14.91)	4 15½	(20.20)
Machinists	3 3½	(13.43)	4 15½	(20.20)
Laborers	2 14¼	(11.53)	3 12	(15.23)

*North Midland. †Wales and Monmouthshire, except ‡, which represents London.

These rates as quoted, subject to minimum and maximum limits, included all bonuses. They were highest in Wales and Monmouthshire and lowest in North Midland, with London in an intermediate position.

While wage rates in Paris are considerably higher than elsewhere in France, the difference is less marked than formerly. A tendency to come to a standard 8-hr. workday is observed, both in Paris and outside, which accounts for the fact, shown by the table, that the percentage of increase over 1911 is much greater in hourly wages than in daily wages. Previous hours varied from 9 to 10 per day.

Average Hourly and Daily Wages in Paris in 1921

	Daily (8 Hr.)	Per Cent Increase Over 1911 Daily Wage	Hourly Wage
Tinsmiths	28 fr. ($2.24)	250	337
Blacksmiths	32 (2.56)	220	300
Locksmiths	26 (2.08)	225	261
Metal turners	28 (2.24)	240	280

Wages in Brussels appear to be lower than in Paris. The following table gives those of the principal classifications of metal workers:

Average Hourly Wages in Brussels, November, 1921

Mechanics, electricians, tool makers, moulders, polishers, lathe workers, welders and steel workers	3.00 fr. (21.1c.)
Boiler makers and tin workers	2.75 (19.4c.)
Grinders	2.65 (18.6c.)
Blacksmiths, tinsmiths, locksmiths, etc.	2.50 (17.6c.)
Borers and metal filers	2.25 (15.8c.)
Unskilled factory hands	1.75 (12.3c.)

For Berlin, the figures given are official. The sharp distinction between single men and married men, nonexistent in 1914, is interesting, as is also the closeness of the unskilled worker's present wage to that of the skilled operative.

Weekly Wages in Berlin Metal Trades

	July, 1914		February, 1922		Per Cent Increase (Nom.)
Single Men:					
Skilled	42.44 m.	($10.15)	495.23 m.	($2.49)	1067
Semi-skilled	39.96	(9.55)	469.65	(2.36)	1075
Unskilled	30.62	(7.32)	455.70	(2.29)	1388
Married Men:					
Skilled	42.44	(10.15)	634.73	(3.20)	1396
Semi-skilled	39.96	(9.55)	609.15	(3.07)	1424
Unskilled	30.62	(7.32)	595.20	(3.00)	1844

The new building of the Ellwood City Forge Co., Ellwood City, Pa., of mill type construction 95-ft. x 120-ft. which is to be used as a press shop, is nearing completion. The company is installing a new 500-ton forge press, built by the United Engineering & Foundry Co., Pittsburgh, supplementing 6000-lb. and 3000-lb. hammers, now erected, furnished by the Chambersburg Engineering Co. Two new 40-in. x 32-in. turning lathes are to be installed. The new shop is expected to be in operation in about three weeks. The company is now running on a two-turn schedule.

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The Strike and "Rights"

No phase of the railroad and coal strikes is of graver concern than that of which President Harding spoke in these words in his address to Congress:

> It is fundamental to all freedom that all men have unquestioned rights to lawful pursuits to work and to live and choose their own lawful ways to happiness. In these strikes these rights have been denied by assault and violence, by armed lawlessness. In many communities the municipal authorities have winked at these violations, until liberty is a mockery and the law a matter of common contempt. It is fair to say that the great mass of organized workmen do not approve, but they seem helpless to hinder. These conditions cannot remain in free America. If free men cannot toil according to their own lawful choosing, all our constitutional guarantees born of democracy are surrendered to mobocracy and the freedom of 100,000,000 is surrendered to the small minority which would have no law.

Then as he closed the President said this:

> Wherefore I am resolved to use all the power of the Government to maintain transportation and sustain the right of men to work.

In the newspaper accounts we are told that these ringing words were applauded with spirit. The press of the country applauded, also, as did most of the reading men and women among the round 100,000,000 whose freedom to live and to choose their work has been challenged by the terrorism the two strikes have developed here and there throughout the country.

But the labor union leadership that is responsible for much of this terrorism does not believe that American citizens have any such "unquestioned rights" as these which the President asserts are "fundamental." Labor union leaders have not joined in the applause which greeted the President's utterances on the floor of the Congress. The labor union creed admits no such right in the case of a man who offers to do the work which a union man has refused to do. Under the "law" of the labor union, as expressed by the president of the United Mine Workers of America, men who attempt to mine coal in places which striking mine workers have given up are to "be treated as ordinary strike breakers." When railroad workers stop the wheels of transportation and in defiance of the Government's Railroad Labor Board seek to paralyze industry and destroy the country's prosperity, all men who come to the help of the people by moving the food and fuel on which their lives depend are branded as "scabs" and pariahs. The West Virginia coal miner with whom President Church of the Carnegie Institute talked at Pittsburgh the other day, and who wanted to go back to his job after three months with neither work nor strike benefits, knew what he was talking about. When asked why he did not go back he said simply, "They would shoot me."

President Harding leaned backwards in saying that "the great mass of organized workmen do not approve" of assault and violence by armed lawlessness. When Mr. Gompers called the President's address "ill-timed" he was giving unmistakable expression to the spirit which has actuated the labor union leadership of the two strikes from the beginning. The only right which that leadership has asserted in all the suffering it has brought upon the country is the sacred "right" to strike and to enforce its demands after the manner of the highwayman.

Out of all the distress of this time a way must be found for treating workers in coal mining and transportation—in respect to what they may do by striking—more nearly as the Boston policemen were treated when they attempted to force their will upon the people by making them defenceless against the assaults of thugs and other criminals. If the way is not found, the 100,000,000 or more of the American people against whom the coal miners and railroad workers are striking should do the honest thing and admit that Presidential proclamations of "fundamental rights" are only barren idealities and that minorities—even small minorities—may rule if only they are sufficiently menacing and politically powerful.

A sales promotion letter, offering syndicate

matter on the export trade, has come to this office. It opens with this sentence:

> You can be thankful when the rail and coal strikes are settled, for then prosperity will smile again.

Whether prosperity is to "smile again" depends much on the way these most disastrous of recent labor conflicts are settled. The railroad strike is still on and the basis on which its embargo on industry will be lifted is yet unknown. The Cleveland settlement of the coal strike, as fast as it becomes effective, fastens on the country even higher than war-time coal mining costs. With other wage advances that are to come in its train, the steel industry has again started on a spiral ascent in prices which must raise a serious question as to the duration of demand even on the reduced scale of to-day. The country cannot have prosperity on a 2-cent to 2.25-cent basis for steel, and on the labor and fuel costs that are now in sight steel manufacturers may make up their minds to a diminishing share in the export trade. If reinflation to war-time prices is what the country wants, it has been set well on its way to that condition by the events of the past week. The mine workers' leader, in proclaiming their victory, announces that the "much heralded theory of deflation or liquidation of labor . . . has now suffered another collapse as far as affecting the mining industry is concerned." But the consequences of that settlement will have little of the aspect of victory when the reaction comes, as come it must, from the folly of attempting to build prosperity on war-time prices.

The Cleveland Surrender

The so-called Cleveland settlement by union miners and a few operators representing a small percentage of the bituminous coal mined in this country was an ignominious surrender. The member of the Cleveland iron trade who commented that it was a case of organization against demoralization told the truth, for the union was united and firm while the operators were torn by dissension. Even on the question of arbitration there was serious disagreement among the operators, and at the last minute, when all provision as to arbitration was omitted, some of the leading operators refused to sign the compact.

For any one who has followed the history of the coal strike, it is clear that while many of the operators, controlling a large percentage of the output, were willing and anxious to deal fairly with employees, the public and all concerned, even to the extent of losing "literally millions," in the language of Secretary Hoover, "in order to maintain themselves and their industry in public repute," others cared little for honor so long as they could add to their exorbitant profits. Doubtless some who signed the Cleveland agreement were among those so vigorously denounced by Secretary Hoover, while others may have been driven to the action by financial necessity. Whatever the cause, the fact stands out that the union won in its principal contentions, including the obnoxious "check off," by which the operators must continue to collect union dues; and in all this there is no assurance that there will not be another and a much more serious strike next April. For many months coal was being stored in anticipation of the strike which was started April 1, but by April 1 of next year stocks will be virtually exhausted and the union will be in a much stronger position than it has been during the present troubles.

The hope of the country rests on some definite plan of action being adopted to prevent another industrial struggle much more disastrous to the industries than any that has been seen. In his letter of Aug. 18 to Senator Borah, Secretary Hoover pointed out that even the $6.25 average price which had been mentioned by the Senator is "an average of a lot of decent men selling fair price coal with a minority of bootleggers selling it up to $12." The secretary also declared that "the substantial and public spirited coal operators themselves feel that their only protection from unjust criticism lies in some workable method that will compel a minority to righteous business practices."

We believe that the better class of operators will help in bringing about the enactment of necessary legislation and in taking any steps necessary to prevent an industrial catastrophe; but it will not do to depend upon too much from the proprietary side of the industry as it is now constituted. The fair-minded American citizen—particularly the employer who is determined to deal fairly with the public and the miners—must do his full part and do it courageously. It will not be enough to mean well and do nothing. Unfortunately this last is the description of far too large a proportion of officialdom at Washington.

The Case of Repetitive Operations

Seldom does any one appear in defense of the task of repetitive operations so common in modern manufacturing. Many decry the dulling effect on the intellect, of highly subdivided processes, but these champions of the machine operator are usually apart from industry, while those who direct manufacturing remain silent. Thus unanswered charges gain credence. Yet in informal discussions those in daily contact with the conditions show no concern lest deadening of the mind, for example, result from simple operations repeated time after time. The testimony of industrialists is difficult to get. Being neither writers nor speakers their views are not widely known, and being well entrenched through the evolution of the factory their attitude seems to be that they are not on the defensive.

But sooner or later they must be smoked out. Too much is being written against modern factory procedure for the factory side to disregard the making of favorable public sentiment. All the good features of repetitive work and mass production, as affecting the human being, need to be set out in an authoritative way, if demands for a change are to be stayed. Any breaking down of present practices through legislative or other pressure may be far off, but in this day of increasing emphasis on the welfare of the indi-

vidual, new laws affecting industrial relations are always in the reckoning.

Apologists for the industrial system have been wont to say that large numbers of machine operators are adults of arrested mental development. Having only child minds, they are not supposed to find their work especially irksome. This is important, if true, in that the system has provided for a group that has been reared as superior to so-called common-labor service and generally is not physically equipped for it. In accommodating this class the system has also released workers of more resourcefulness for the problems higher up in the industrial scale. There are also in the shops those of adult intellects but without special education. Their minds are capable of development, and it may not be granted that they are immune to the effects of monotony. However, whether moron or not, the social uplifter will demand a showdown.

Some explanations coming from the workshop have reached the public, and they may be indeed the complete answer to "The Iron Man in Industry" and similar criticism. They emphasize the inertia of the human being and the propensity of all of us to do most of our daily acts along the lines followed in the past. Plant managers tell how hard it is to get a worker to change his methods and they assert that fully as much effort would be needed for the worker to break a new habit and resume the old. Mental satisfaction comes in part from moving in accustomed paths. It may be that man's desire to act and think along well known lines in most of his activities safeguards him fully against the "iron man." But we need the facts from the authorities of industry.

British Capacity and Output

According to reliable estimates British steel-making capacity increased in the period 1914 to 1921 from almost 7,000,000 tons to about 11,000,000 tons per year. But the 1922 statistics covering blast furnaces seem to indicate a nearly static condition, for the actual number had decreased by five in the same period. It is known that the productive capacity of the 494 furnaces at the beginning of 1922 was somewhat larger than that of the 499 in 1914. It is certain, however, that the seven years' increase in steel-making capacity has decidedly outstripped that in pig iron.

Several interesting questions are suggested by this situation. If the pig iron producing capacity is practically no greater than before the war, whence will come the needed pig iron for the enlarged steel furnace capacity, or must imports of pig iron and semi-finished steel be increased? Also, must not steel exports be augmented considerably to provide an outlet for the additional 4,000,000 tons of steel ingots or their equivalent in rolled products?

The answer to these questions is not found in the course of the British industry thus far this year. The production of both pig iron and steel has been far below even pre-war capacity. In the first half of this year only 2,149,300 tons of pig iron and 2,562,400 tons of steel ingots and castings were produced. In the case of steel the present rate is only 45 per cent of rated capacity. In exports a better showing has been made, the total to July 1 having been not far from the corresponding 1920 total, but only 61 per cent of the 1913 rate.

American, French and German steel outputs, in spite of strikes and other disturbances, make a far better showing, both in relation to capacity and to pre-war records. Great Britain, with its labor and political problems, has not yet undergone a sufficient readjustment either in prices or in labor.

Government Advice for Railroads

For many years the public has been treated to charge after charge that the railroads are poorly operated. Scarcely a point in the management of railroads has escaped criticism. Some friends of the railroads insist that this is chiefly "propaganda" looking to Government ownership. That may be the chief cause of all the criticism, and it may not be. There is no doubt that in some respects the railroads have not been run so well as they might have been run. It is possible that human nature has a good bit to do with it; that railroads, being so much in the public eye and being public servants in such a broad manner, are naturally picked out when one wishes to exercise his critical bent.

Whether or not the cause of the criticism is a desire for Government ownership, or at least operation, there is one experiment that is well worth trying. Beyond question the experiment would throw a great deal of light not only upon railroad operations as we find them but upon this continuous criticism itself. The experiment is for the Government to establish a bureau of advice. Merely the form and scope would be new, not the principle itself. Year by year the Interstate Commerce Commission has gone further into railroad operation, but only upon certain relatively narrow lines. It has prescribed safety devices; and while the fundamental basis has been the protection of the public, the financial aspect has been considered. The Interstate Commerce Commission is already burdened and the duties of the body as now constituted ought not to be increased.

When it appeared that the mining operations of the country could be improved it was not proposed that the Government own or even operate all the mines. The action taken was to establish the Bureau of Mines. The work of that bureau has greatly improved mining operations in the United States, as every one knows, and repeatedly mining interests have appealed to Congress to let the bureau have more money so as to increase its usefulness.

A Bureau of Railroads, conducted on somewhat the same principle as obtains with the Bureau of Mines, would be of great benefit to the railroads. All the large railroads conduct extensive research work, yet no road does all that it might do, and the results are not, as a rule, common property, even though railroad men with their

various associations and conventions have shown a strong co-operative spirit.

While a Bureau of Railroads might well be modeled in a general way after the Bureau of Mines, one of its important duties should be to consider these criticisms that are constantly being made of the railroads. Let the criticisms be run down so that all may know whether or not there is anything in them. If there is anything in a particular criticism, improvement can be effected. If it is shown that there is not, the critic will be discredited. If there are improper or ulterior motives in the criticism the motives will eventually be laid bare, to the vindication of the railroads and the comfort of a public which while long suffering has been growing rather tired of the criticism continuing without anything coming of it.

An objection raised to suggestions of this general character is that it is necessary to use compulsion with the railroads. That is not proved. The establishment of an advisory bureau would determine. If the railroads were given good advice and did not follow the advice, crucial cases would be presented, affording definite basis for considering whether compulsion should come next.

CORRESPONDENCE

Electric Furnaces for Steel Manufacture in Italy

To the Editor: Replying to an article by Edwin F. Cone which appeared in THE IRON AGE, Jan. 5, 1922, entitled "Status of the Electric Steel Industry," and in which it is stated that there were about 50 electric furnaces in Italy in 1921 for the manufacture of steel, A. Stromboli in the April number of *La Metallurgia Italiana* states that the above figures should be corrected.

According to Dr. Stromboli there were at the end of 1921 about 180 electric furnaces between large and small distributed in about 50 different establishments. Many furnaces were installed in the Acciaierie Martin, and other new establishments were opened with complete electric equipment. The total capacity of these furnaces was about 800 tons and if all were in a condition to work regularly, it is estimated that about 1,000,000 tons of steel per year could be produced. The production of 1921, however, was only about 130,000 tons.

The most important plants and largest furnaces are in the north of Italy. There are 23 furnaces of the Héroult type of 15 tons, and 10 of from 6 to 8 tons capacity. They are distributed as follows:

	No.	Capacity, Tons
Acciaierie Ern. Breda, Sesto San Giovanni	6	15
Acciaierie e Ferriere Lomb., Sesto San Giovanni	5	15
Stabilimento di Dalmine	4	15
	2	[illegible]
Acciaierie Ansaldo Aosta	4	15
Acciaierie Franchi Gregorini Allione	3	15
Acciaierie di Terni	1	15
Acciaierie Redaelli, Rogoredo	3	7
Acciaierie Cravetto Verrès	3	6
Acciaierie Caleotto, Lecco	1	7
Acciaierie Ceretti, Villadossola	1	8

There are also 6 furnaces of the Fiat type of 5 to 6 tons capacity in the Acciaierie Fiat at Turin and one of 1½ tons capacity, as well as four of the Fiat type of 20 to 25 tons capacity and two of 6 and 3 tons capacity in the Ferriere Piemontesi.

There are 11 furnaces of the Girod type of 3 to 5 tons capacity in the Acciaierie Franchi Gregorini at Allione, 2 of 3 to 5 tons capacity in the Acciaierie Franco Tosi at Legnano, and 3 of 5 tons capacity in the Acciaierie di Castelnuovo dei Sabbioni.

There are about 30 furnaces of the Stassano type in various establishments, many of which are of 2 to 5 tons capacity, and 3 of 1½ tons capacity in the Acciaierie Breda at Sesto San Giovanni, and there are others in the Acciaierie Franchi Gregorini at Lovere, in the Fonderie Milanesi di Acciaio at Milan, in the Acciaierie Redaelli at Rogoredo, in the establishment of Darfo of the Ferriere di Voltri, in the Acciaierie Ansaldo at Cornigliano Ligure, in the Acciaierie Cravetto at Verrès, at the establishment of the Società Whitehead at Naples, and in the Acciaierie of Piombino.

In conclusion there are about 60 to 70 furnaces of the types Stassano-Bassanesi and Stassano-Angelini dispersed in numerous small foundries, the majority of them being of one ton capacity and some of three tons capacity.

I. C. FUNK,
American Consul.

Genoa, Italy, June 30.

GERMAN FOREIGN TRADE

Export Iron and Steel Movement Steady—Imports Increasing

Exports of steel and iron from Germany in April and May were 200,676 and 209,432 metric tons respectively, according to data published by *Stahl und Eisen*. The following table gives the details of the German foreign trade for May and the five months in metric tons:

	Imports, 1922, Jan. to May	Exports, 1922, Jan. to May	Exports, May, 1922
Pig iron	93,311	83,555	10,321
Ferroalloys	5,843		
Scrap	163,532	9,848	1,393
Cast iron pipe	16,971	17,469	4,954
Rolls	86	3,422	540
Machine parts	643	2,681	360
Other castings	3,884	37,030	7,604
Brooms, billets, sheet bars	87,686	15,620	2,632
Bars, joists, strips	211,051	217,488	40,787
Plates and sheets	19,165	84,116	22,978
Tin plates and other sheets	3,229	12,117	2,357
Wire (rolled and drawn)	20,828	59,779	12,431
Tubes	4,789	56,537	13,649
Rails, sleepers, fishplates	34,238	128,507	33,560
Wheels, axles, tires	40	19,721	5,606
Forgings, etc.	3,583	52,280	8,341
Structural work	601	23,257	4,181
Boilers, etc.	1,250	13,057	2,378
Anchors, hammers, etc.	116	2,575	475
Agricultural implements	484	16,062	3,277
Tools	347	17,045	3,351
Rail joint studs	2,154	7,440	2,030
Other railway materials	193	3,039	553
Bolts, nuts, rivets	2,591	13,302	2,612
Carriage and cart axles	94	1,394	312
Railway and cart springs	202	2,457	502
Wire ropes	69	4,315	817
Other wire goods	134	24,473	5,961
Wire and other nails	114	24,009	5,578
House utensils	44	17,901	3,633
Chains	30	2,982	381
Miscellaneous	18,474	47,635	5,932
Total iron and steel included above	695,776	1,021,112	209,432
Machinery	4,327	187,387	40,497

The leading items of export to June, this year, have been pig iron; bars, beams and strips; plates and sheets; wire; tubes and rails, etc.

In imports the outstanding item is scrap with both semi-finished and finished steel heavy.

Receipts of iron and manganese ores are given as 4,629,542 tons to June 1.

Export and import totals by months have been as follows to date in metric tons:

	Exports	Imports
January, 1922	221,743	100,907
February	172,709	81,878
March	211,979	125,158
April	200,676	166,131
May	209,432	221,701
Average per month to June, 1922	204,221	139,155
1921 (average per month, 8 months)	203,681	.....
1920, average per month	145,883	34,951

A marked steadiness in export volume but a large increase in the import rates are to be noted.

GERMAN PRICES AGAIN RAISED

Steel Syndicate Further Advances Ingots and Finished Steel

(*By Cable*)

BERLIN, GERMANY, Aug. 20.

Steel Syndicate prices, to prevail from Aug. 19 to the end of the month, have been announced, as follows:

Ingots .....17,880 marks per metric ton ($15.21 per gross ton)
Bars .....24,050 marks per metric ton (0.91c. per lb.)
Thick plates..27,000 marks per metric ton (1.03c. per lb.)
[Exchange at 8⅜c. per 100 marks.]

Other steel prices have been raised proportionately.

The Eisenwirtschaftsbund has rejected a proposal to reimpose maximum prices on the Steel Syndicate's products.

[These quoted prices replace 14,480 marks for ingots, 21,070 for bars and 23,660 for thick plates. Collapse of exchange, however, makes the present prices lower, in American money, than before.

In THE IRON AGE of July 27, page 229, it was noted that "while the legal maximum pig iron prices" (which are fixed by the Eisenwirtschaftsbund) "have been raised four times since May 1, the Stahlbund products have been raised only twice. However, the new fall in mark exchange has again thrown German prices far below those of the world market and for a time German complaints of English, French and Belgian underselling of Stahlbund products have ceased. * * * A marked divergence as to price policy * * * among the groups represented in the Stahlbund * * * has tended to keep down Steel Syndicate prices."—EDITOR.]

CHAOTIC GERMAN MARKET

Weekly Readjustments Owing to Exchange Situation—Russian Business Developing

(*Special Correspondence*)

BERLIN, GERMANY, Aug. 2.—The depreciation of the currency will hardly lead to an increase in export orders in the iron trade, especially in semi-finished material, as the recent increases in prices have outstripped the rise in foreign currency. The Iron Trade Association (Eisenwirtschaftsbund), which fixed prices every few weeks, usually every month, has now decided to do so every week, in view of the rapid depreciation of the German currency and the almost daily change in the cost of production. The rapid decline of the mark seems, however, to have led to a bewilderment in some manufacturing quarters, and the increases in the prices by the Iron Trade Association have aroused much comment.

The surcharge for open-hearth material is 900 marks over the Bessemer product at present; but this will come up for decision at the meeting of the Steel Syndicate (Stahlbund), when it may be altered, together with the base prices, if the rate of exchange is further declining.

The prices for scrap iron are stiffening perceptibly and the import is increasing. Russian scrap is arriving in larger quantities lately. Some time ago the import duty for different sorts of scrap had been taken off, and now the duty for turnings, filings and sheet metal scrap is also to be abolished in order to stimulate imports. The Federal commissioner for the iron trade has been given power to requisition stocks if necessary to provide sufficient supplies for the industry. Steel scrap is quoted at about 7,500 to 7,600 m. per ton, but prices show a further upward tendency, and cast iron machine scrap has already reached 8,500 m. and higher per ton.

Among the engineering firms those building grinding mills occupy a special position, inasmuch as the prices of their products directly influence the prices of flour, bread and other food stuffs. The rigorous price policy of the grinding mill manufacturers has, therefore, elicited much comment. In 1921, five of the largest firms in this line formed a sort of syndicate, the "Miag" (Mills and Industry Aktien Gesellschaft), and the firms are now selling at prices fixed by the Miag. The syndicate endeavors to extend its influence among the mills in Germany, and all the firms belonging to it are increasing their capital as follows: Amme, Giesecke & Konnegen, Braunschweig, from 26 to 50 million marks; G. Luther, A. G. in Braunschweig from 18 to 30 million marks; Gebrüder Seck, Dresden, from 20 to 40 million marks; Hugo Greffenius, A. G. from 12 to 18 million marks, and Kapler, A. G., Berlin, from 4 to 8 million marks.

A new firm in this line Kallenberg, A. G., Berlin, has been formed with a capital of three million marks by interests closely connected with the Miag. The firms combined in the syndicate have almost a monopoly in grinding mill construction in Germany, and importation of machines from abroad is impossible on account of the unfavorable German exchange.

The Russian market receives increasing attention in nearly every industry in Germany. Representatives of the electric industry are negotiating with the Soviet government. Electrical manufacturing being in a sound financial position and having a good export organization (about 40 per cent of the production is exported at present) is especially adapted to develop its trade with Russia.

The automobile industry is also making endeavors to regain its pre-war position in Russia. The Russian railroad system being only poorly developed, there is a large market for motor lorries and tractors. The revival of agricultural activities and the improvement of transport facilities are receiving the foremost consideration of the Russian Government at present. A large number of automobiles is required to bring agricultural produce and other goods to the railroad stations, and competition in automobiles was keen before the war. Germany supplied the greatest number of cars. France was second and Great Britain, Italy, Belgium and America followed. Most of the American automobiles were of the Ford production, and a number of American motors, both stationary and automobile, are still in use in Russia at the present time.

Orders for Springfield, Ohio, Plants

SPRINGFIELD, OHIO, Aug. 22.—Orders have been booked by the Steel Products Engineering Co. for ten sets of Liberty stub tooth gears for aeronautical engines, General Manager George Ireland states. The company also received orders for punches, dies and jig fixtures. The plant, Mr. Ireland states, is gradually getting back into its old swing. The large order for balloon equipment received recently is about one-fourth finished. Shipment will be made within the next three months. The company added a number of skilled machinists during the week.

A good sized order for seeding machines was left with the American Seeding Machine Co. by representatives of the company located in Buenos Aires, South America, and New York. The shipment to South America will be started in October. The representatives say that business conditions in South America are improving. Officers of the company report that there is a more optimistic feeling prevailing among the dealers and travelers, as farmers are manifesting an interest in the purchase of agricultural implements.

Business is steadily improving at the plant of the Springfield Malleable Iron Co., President T. W. Ludlow states. There is a shortage of molders due to the general demand for men.

Several of the Springfield manufacturing companies which have individual power plants are in a serious condition as a result of the coal shortage and the fact that they are in class 5 of the Government's priority order. Among these are the Buffalo-Springfield Roller Co. and the Safety Emery Wheel Co. The former company hauled two carloads of coal from a nearby city by motor trucks.

FRENCH PRICES UNSTEADY

Mills Soon to Attempt to Get Reduced Costs—Sheets Active

(*Special Correspondence*)

PARIS, FRANCE, Aug. 10.—Domestic demand for iron and steel remains restricted, except as regards sheets. Some business is being done for export, but at disputed prices, and the fall of the German mark is having a restrictive influence. Nevertheless, the situation is much better than it was one year ago, and most of the works have orders on hand which will carry them until October.

French ironmasters met in Paris in the third week of July, prior to the holiday season, and, in the face of higher coke, decided to oppose by all means possible any further crumbling of prices. Some of the largest concerns are now sustaining losses, and as soon as holidays are over, that is, toward the end of September, they will actively canvass the question of remedial measures. Foremost among them are: 1, the financial support of exports; 2, the constitution of an international trust for working export markets, based on corresponding national organizations; 3, reduction of the present rail transportation rates; 4, an improvement of the now deficient labor supply.

The French production of pig iron in June was 415,752 tons. It was 442,206 tons in May. The steel production likewise decreased from 363,803 tons in May to 358,097 tons in June.

Iron Ore.—The French production of iron ore in June was 1,621,624 tons, as against 1,546,122 tons in May; while stocks decreased from 3,446,084 tons at the end of May to 3,330,970 tons at the end of June. The French Railway Board, at its meeting of Aug. 9, adopted the principle of further reductions on rail transportation rates for iron ore (at the same time as for coal and coke). The detail of these reductions is not yet obtainable.

Pig Iron.—The current inland price of chill-cast foundry pig iron, No. 3 P. L., remains 205 to 210 fr., but the price of 202 fr. was accepted for a contract of 250 tons. On the other hand, for small contracts or superior quality pig iron, prices of 210 to 215 frs. are still being paid. We note, however, that producers refuse now to bind themselves, except for a short time ahead. With sterling exchange at 55.83 fr., French hematite can easily push back British competition.

Beams.—The volume of orders is satisfactory. The present export price, f.o.b. Antwerp, of beams from Lorraine works, is about 360 fr. (French currency), or 1.35c. per lb.

Sheets.—The market is now extremely active, and there is quite a rush of orders in anticipation of an increase of prices and of a further lengthening of times of delivery. These are at present 10 or 12 weeks for thin sheets and about six weeks for medium and thick sheets. The base prices of the Comptoir des Tôles have not, so far, been officially modified. Nevertheless, it seems certain that this organization is already now varying them, according to required tonnages and delays of delivery, to suit the present tendency of the market.

For export, the following prices f.o.b. Antwerp (French currency) have been done for sheets and plates from Lorraine works:

Mild steel:		
Sheets of 5 mm. (0.2 in.) and over	440 fr.	1.65c. per lb.
Medium sheets	520 fr.	1.95c. per lb.
Open-hearth steel:		
Boiler plates	620 fr.	2.3c. per lb.

Rails.—Luxemburg rails are selling for export at 410-415 fr., f.o.b. Antwerp (Belgian currency), or $32 a metric ton.

Rolled Merchant Products.—This market is now inactive and the mills are badly needing orders. Prices, however, are rather well maintained and, while the price of 400 fr. has been accepted for one big order of a plain assortment, the current price at Lorraine works is 410-430 fr. (1.53c. to 1.60c. per lb.)

Times of delivery are not below 8 to 12 weeks for medium and small shapes, and even 16 weeks at some works. This applies to iron works in the East and in Lorraine. In the Center and West of France, delays may be shorter, but prices are much higher.

Semi-finished Steel.—The market is rather active for export. Lorraine and Saar works are quoting the following prices, f.o.b., Antwerp (French currency):

Basic Bessemer steel:	
Ingots	290 to 300 fr.
Blooms	310 to 320 fr.
Billets	325 to 335 fr.
Flat billets	340 to 350 fr.
Open-hearth steel:	
Blooms	320 fr.
Billets	350 fr.
Flat billets	370 fr.

Wire.—The present price is 450-470 fr. (or 1.68c. to 1.75c. per lb.).

Castings.—Improvement is maintained, but prices remain very low. For instance, the price of 400 fr. (1.50c. per lb.) per metric ton was recently tendered to the Compagnie des Chemins de fer du Nord for brake shoes.

LITTLE STEEL FOR EXPORT

American Mills Almost Wholly Out of Market Except for Deferred Deliveries

NEW YORK, Aug. 22.—Unable to meet the demands of their domestic trade, American steel mills have almost wholly dropped out of the export market for the time being. The United States Steel Products Co. is quoting on plates, shapes and bars and a few other products, but only for deferred deliveries, and is entirely out of the market on wire rods. Independent steel companies are doing practically no quoting. Exporters who are receiving cables from their customers abroad are frequently unable to obtain any satisfactory quotations.

Just how long this situation will continue is contingent almost entirely upon the resumption of coal mining and the ability of the mills to catch up with their current orders. Fortunately the American mills are not losing a great deal of foreign business through their inability to ship because the demand from abroad is decidedly limited in volume. Japan is again the principal buyer, but its current requirements are not large, though it is expected that the next few months will bring another buying wave from this Far Eastern customer.

Next to Japan the best demand is from South America, particularly from the east coast. Wire products, including fencing and barbed wire for the livestock ranges of the Argentine, are more generally sought for than any other steel products.

When quotations are made they are still considerably below the level of domestic prices. In Canada the leading interest is now asking 1.65c., Pittsburgh, for plates, shapes and bars, but most of the Canadian buyers covered a few months ago at $5 or $6 a ton below this figure. No more is heard of the anti-dumping provisions of the Canadian law since the Canadian mills have at present all of the business that they can comfortably take care of.

Prominent among the current Japanese inquiries is one for 16½ miles of 60 lb. rails, about 1700 tons, on which bids close Aug. 31; another inquiry is for 2500 tons of structural steel for towers, on which bids close Aug. 25. An inquiry for about 5000 boxes of tin plate from a Japanese oil interest has probably been closed within the past few days.

Iron and Steel Markets

HIGHER WAGES, HIGHER STEEL

Steel Corporation Labor Up 20 Per Cent and Independents Follow

Coal Strike Settlement Points to Steel Prices That May Check Demand—But Railroads Still Buy

The Steel Corporation's 20 per cent wage advance and the establishment of the $7.50 basis for coal miners make this the pivotal week of the year in iron and steel. It is well realized in the industry that in a scarcity market these advances in cost mean higher prices for steel, and the uppermost question is how far this further rise will act to check business.

Independent producers had been looking week by week for this action by the Steel Corporation, and on Sept. 1 they also will increase wages 20 per cent. In the Central West this will put common labor up to 36 cents per hour. At Eastern mills, which have had a 25-cent basis for more than a year, the new rate will be 30 cents.

The winning of the 1920 rate by union coal miners means a like rate at non-union mines, representing $1.50 to $2 increase in the cost of a ton of steel. But market prices of coal and coke add several times more than $2 to the costs of such steel works as must buy coal and coke in the market.

What change the week's advances in fuel and labor will make in the Steel Corporation's price policy is of first consequence to other makers and to all buyers of steel. Advances are expected, but to what extent will develop after the meeting of the corporation's sales managers now being held in New York.

Sales of steel fell off sharply after the Cleveland agreement on coal. Buyers were in the market, but sellers could not name prices. Some plate makers indicated that 2.50c. would probably be their next price. The disappearance of the recent 1.80c. figure of the Steel Corporation on plates, shapes and bars was freely predicted.

A marked change has come since Monday in coal mining in western Pennsylvania. Large operators who had refused the Cleveland terms appear to be falling in line, with indications that the week will see nearly all union mines starting up. At non-union mines in the Connellsville field miners have been advanced from $5 to $7.50.

Thus steel companies having their own mines are in position to increase their coal supply when the railroad strike is settled, but transportation, as for several weeks, is still the limiting factor in the turning out of steel.

Plants depending on Kentucky and West Virginia fuel have had no better deliveries in the past week. Priority orders will send much of this coal to the Northwest.

Pig iron and steel output is slightly less than last week's.

Further considerable railroad buying in the Chicago district is looked for in case the strike is settled, 12,000 cars being under consideration. How many cars the Pennsylvania Railroad will buy, of the 25,000 on which its inquiries were withdrawn some weeks ago, does not yet appear. Locomotive works are doing well. Among the week's orders are 80 for the Union Pacific and 30 for the Erie.

A number of large western railroads are quietly putting out inquiries for rails for 1923, and in view of the unusual conditions their orders are likely to be placed earlier than in several years.

Two other items in the railroad market are the buying of $200,000 worth of machine tools by the Union Pacific, and negotiation for $150,000 worth by the Illinois Central.

Poland has bought some 8000 cars which the United States had built for war use in Europe and had lately expected to sell from the storage yards in Virginia for the old material they would yield.

With awards of 24,000 tons, including 9500 tons for the new Otis steel plant, fabricated steel demand in August appears fully up to the rate of July, which at 62.5 per cent of capacity compares with 55 per cent for all of the preceding decade.

In the midst of advancing prices, large buyers of tin plate are still able to cover at $4.60 a base box with the contract market quoted at $4.75.

Scarcity of pig iron is much more pronounced and prices soar. In the East, only two blast furnaces have any product for sale and important buyers who are in the market, including electric and radiator companies, are considering the buying of foreign grades. In the Mahoning Valley, virtually no iron is obtainable. In Philadelphia, inquiries have come from such distant points as Pittsburgh, Chicago and Buffalo. In the South, $21 is now the minimum paid to furnaces, and as high as $25 has been paid on limited tonnages, but some resale Southern iron is still to be had at Cincinnati at $20, Birmingham. Iron from Cleveland and Buffalo is being sold in Pittsburgh at high prices.

Presumably because of the extent of the demand from the United States, British pig iron producers are fixing an export premium. German prices are now being advanced weekly, but the violent jumps exceed the drops in mark exchange and check export business.

Pittsburgh

Prices Still Moving Upward—Little Increase in Coal for Industries

PITTSBURGH, Aug. 22.—The upward surge of iron and steel prices continues, and apparently further advances on top of those which have taken place in the past week or so are immediately ahead, in view of the wage increase just announced by the Steel Corporation, which will affect all other producers. Meanwhile, the coal strike gives signs of ending in a victory for the union, which will mean that the miners from now until April 1, 1923, are to enjoy post war peak wages and working conditions. The payment of these wages alone would not be sufficient reason for the maintenance of the present high coal price, but the big loss of production sustained during the strike means that a good

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Aug. 22, 1922	Aug. 15, 1922	July 25, 1922	Aug. 23, 1921
No. 2x, Philadelphia‡	**$33.14**	$33.14	$28.76	$20.84
No. 2, Valley furnace†	**33.00**	30.00	25.00	20.00
No. 2, Southern, Cin'ti	24.05	24.05	22.55	23.50
No. 2, Birmingham, Ala.†	**20.00**	19.50	18.50	19.00
No. 2 foundry, Chicago*	30.00	30.00	25.00	20.00
Basic, del'd, eastern Pa.	**28.64**	27.25	25.75	19.00
Basic, Valley furnace	26.00	26.00	24.00	18.00
Valley Bess., del. Pitts.	**31.76**	28.76	26.76	21.96
Malleable, Chicago*	30.00	30.00	25.00	20.00
Malleable, Valley	**31.50**	28.00	27.00	20.00
Gray forge, Pittsburgh	**34.76**	30.00	26.26	21.46
L. S. charcoal, Chicago	**34.65**	33.15	31.65	33.50
Ferromanganese, seab'd	67.50	67.50	67.50	70.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$40.00	$40.00	$40.00	$47.00
Bess. billets, Pittsburgh	**37.50**	35.00	35.00	29.00
O.-h. billets, Pittsburgh	**37.50**	35.00	35.00	29.00
O.-h. sheet bars, P'gh	**37.50**	35.00	35.00	30.00
Forging billets, base, P'gh	**43.00**	40.00	40.00	34.00
O.-h. billets, Phila.	42.67	42.67	40.17	35.74
Wire rods, Pittsburgh	**45.00**	42.00	40.00	42.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	2.00	2.00	1.70	1.75
Light rails at mill	1.90	1.90	1.75	1.85
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.325	2.325	1.925	2.00
Iron bars, Chicago	2.15	2.15	2.00	1.75
Steel bars, Pittsburgh	**2.00**	1.90	1.70	1.75
Steel bars, Chicago	**2.35**	1.90	1.75	2.13
Steel bars, New York	**2.34**	2.24	2.04	2.13
Tank plates, Pittsburgh	**2.00**	1.90	1.70	1.80
Tank plates, Chicago	**2.20**	1.90	1.75	2.18
Tank plates, New York	2.34	2.34	2.04	2.18
Beams, Pittsburgh	**2.00**	1.90	1.70	1.80
Beams, Chicago	**2.35**	1.90	1.75	2.18
Beams, New York	**2.34**	2.24	2.04	2.18
Steel hoops, Pittsburgh	**2.75**	2.50	2.50	2.25

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.
The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Sheets, Nails and Wire, *Per Lb. to Large Buyers:*	Aug. 22, 1922 Cents	Aug. 15, 1922 Cents	July 25, 1922 Cents	Aug. 23, 1921 Cents
Sheets, black, No. 28, P'gh	**3.35**	3.15	3.15	2.75
Sheets, galv., No. 28, P'gh	**4.35**	4.15	4.15	3.75
Sheets, blue an'l'd, 9 & 10	**2.50**	2.40	2.40	2.25
Wire nails, Pittsburgh	**2.60**	2.40	2.40	2.75
Plain wire, Pittsburgh	**2.35**	2.25	2.25	2.50
Barbed wire, galv., P'gh	**3.15**	3.05	3.05	3.40
Tin plate, 100-lb. box, P'gh	$4.75	$4.75	$4.75	$5.25
Old Material, Per Gross Ton:				
Carwheels, Chicago	**$21.00**	$20.50	$19.50	$13.00
Carwheels, Philadelphia	**19.00**	17.50	17.50	17.00
Heavy steel scrap, P'gh	**18.25**	17.50	17.25	13.00
Heavy steel scrap, Phila.	**15.50**	15.00	15.00	11.50
Heavy steel scrap, Ch'go	**16.00**	15.75	15.50	11.00
No. 1 cast, Pittsburgh	19.00	19.00	19.00	16.50
No. 1 cast, Philadelphia	19.00	19.00	17.50	17.00
No. 1 cast, Ch'go (net ton)	**19.50**	18.50	17.00	13.00
No. 1 RR. wrot., Phila.	**18.50**	18.00	17.50	14.00
No. 1 RR. wrot., Ch'go (net)	**15.25**	14.50	14.00	11.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	*$12.00*	$14.00	$14.00	$2.75
Foundry coke, prompt	*13.00*	15.00	14.00	3.75
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	**14.12½**	14.12½	14.00	12.00
Electrolytic copper, refinery	13.75	13.75	13.75	11.75
Zinc, St. Louis	**6.22½**	6.15	5.95	4.17½
Zinc, New York	**6.57½**	6.50	6.30	4.67½
Lead, St. Louis	**5.60**	5.55	5.40	4.25
Lead, New York	5.90	5.90	5.75	4.40
Tin (Straits), New York	**32.50**	32.12½	32.12½	26.12½
Antimony (Asiatic), N. Y.	5.25	5.25	5.25	4.50

Composite Price, Aug. 22, 1922, Finished Steel, 2.412c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel

Aug. 15, 1922,	2.255c.
July 25, 1922,	2.169c.
Aug. 23, 1921,	2.321c.
10-year pre-war average,	1.689c.

Composite Price, Aug. 22, 1922, Pig Iron, $26.86 Per Gross Ton

Based on average basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

Aug. 15, 1922,	$26.77
July 25, 1922,	24.05
Aug. 23, 1921,	18.97
10-year pre-war average,	15.72

many holes will have to be filled and practically all of the production that can be gotten out between now and cold weather will be wanted. Hence prices seem bound to remain high.

The past week has produced further advances of $1 to $3 per ton in pig iron, while among steel products bars, plates and shapes have gone to a minimum of 2c. for reasonably early delivery. The recent advance of $4 to $6 per ton in steel pipe has been followed by one of $10 per ton in wrought iron pipe, and independent makers of commercial seamless steel tubes have raised prices $6 to $14 per ton. Practically all of the independent makers of sheets have gone to 2.60c. base for blue annealed, 3.50c. base for black and 4.50c. base for galvanized, and on hot-rolled flats, independent producers have made an advance of $5 per ton to a base of 2.75c. Pittsburgh.

The Steel Corporation continues to move with extreme caution in the matter of price advances. It has not yet followed the independent increase in tubular goods nor in wire products and it still holds to 1.80c. Pittsburgh on plates, shapes and bars.

While there has been some increase in the coal production in this part of the country in the past week, the steel industry does not seem to profit thereby, and although operations are only slightly changed from a week ago, the drift has been toward a lower rate. The Wheeling Steel Corporation will bank its furnace at Wheeling to-night and Youngstown Sheet & Tube Co. a few days ago banked one of its two active furnaces. These losses bring the total number of active furnaces in the area bounded by Johnstown, Pa., on the East, Wheeling, W. Va., on the South, and Warren, Ohio, on the North, to 50 out of a total of 139 stacks. This is a loss of 26 from the recent peak, but compared with a total of 25 furnaces active in that territory around July 1, 1921.

A paucity in the buying has produced a weaker market in coal and coke with coal down about $1 to $1.50 per ton compared with prices of a week ago, and coke about $2 per ton off from the prices at last reports.

Pig Iron.—As far as the steel making grades are concerned, the market has passed out of the hands of producers into those of the middlemen. All sales recently noted have been of tonnages bought on speculation some time ago by brokers. An Ohio maker of ingot molds recently closed for 2100 tons of Bessemer iron, all but 100 tons of which was from speculative stocks. This iron commanded $30, Valley furnace, and establishes the market at that level, a clear advance

of $3 per ton over the price of a week ago. We note a sale of 1000 tons of Bessemer iron, also of brokerage ownership, to a West Virginia maker of melting bars at $30, Josephine, Pa. A sale of 2000 tons of basic iron to a Pittsburgh district sheet maker recently was made at $26, Valley furnace, the tonnage coming from a lot of iron held by a scrap firm, which took the iron in exchange for old material. It is doubtful if the latter sale could be duplicated because the supply available for market is now extremely limited and brokers are understood to have bid as high as $27 without securing any. We quote the market at $26, Valley furnace, as that is the basis of the last known transaction. A scarcity approaching a famine of foundry and other special analysis iron exists. Practically no Valley iron is available and the Westinghouse Electric & Mfg. Co., which recently closed for 1650 tons of No. 1, No. 2 and No. 2X grades paid $33, $32 and $32.50 respectively, f.o.b. Cleveland. On iron coming into the Pittsburgh district plant of this company, this would be equivalent to about $33, Valley furnace, for the base grade. Sales of Buffalo iron have been made in this district at a price equivalent to $33.50, Valley furnace, for No. 2 and apparently the same price can be obtained for No. 3 and gray forge grades as for No. 2, since those grades now are being melted in place of No. 2 iron. Evidently the shortage of iron extends into southern Ohio since an inquiry has been received here for 5000 tons of basic, from the Andrew Steel Co., Newport, Ky. Malleable iron has been sold in this market from Buffalo on a basis equal to $31.50, Valley furnace. A feature of the market is that foreign basic iron has been offered here, Scotch hematite basic on a basis of $24.50 c.i.f., Atlantic seaboard. So far as can be learned, no sales of this iron have been made here.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$26.00
Bessemer	30.00
Gray forge	33.00
No. 2 foundry	33.00
No. 3 foundry	33.00
Malleable	31.50

Ferroalloys.—Interest in the market on the part of consumers is at low ebb. The partial settlement of the coal strike has not stayed the downward trend of steel works operations and consumption naturally is decreasing. Not only that, but most steel makers are well protected against their requirements for the next few months, and possibly for a longer period in the event that coal priority distribution plans of the Government are not modified. British ferromanganese has been offered for September shipment at $67.50 without takers, possibly because of the fear delivery could not be made in time to escape the duty proposed in the new tariff bill. There is also an expectation that domestic producers, once the tariff is effective, will take business for less than the price of British material plus the duty. The latter now are asking $75, c.i.f. Atlantic seaboard, for carloads of 76 to 80 per cent material and $100 to $110 for small lots. The leading commercial producer of spiegeleisen is asking $39 furnace, or about $44 delivered this district, for 19 to 21 per cent for a limited tonnage for fourth quarter shipment. Imported material is reported to be available about $3 per ton less delivered. Makers of Bessemer ferrosilicon and silvery iron are out of the market, having little or no tonnage to sell. They have made no change in the official quotations, but on the bases of the most recent business the market is quotable about $3.50 a ton above the last regular quotations.

We quote 78 to 82 per cent ferromanganese, $75 c.i.f. Atlantic seaboard for domestic; British, spot, $72.50; British, future, $67.50; German, 76 to 80 per cent, $67.50 to $70. Average 20 per cent spiegeleisen, $39 furnace; 16 to 19 per cent $38 furnace; 50 per cent ferrosilicon, domestic, $55 to $60 furnace, freight allowed. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, $45; 11 per cent, $48.30; 12 per cent, $51.60; 13 per cent, $55.60; 14 per cent, $58.60; silvery iron, 6 per cent, $33.50; 7 per cent, $34.50; 8 per cent, $36; 9 per cent, $38; 10 per cent, $40; 11 per cent, $42.50; 12 per cent, $45. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $4.06 per gross ton.

Billets, Sheet Bars and Slabs.—Hardly enough business is passing to establish quotations, but with steel production still decreasing and makers experiencing no easing in costs, it is evident that when there is some business it will be at well above the prices which hitherto have been regarded as the market. The Cleveland coal strike settlement has not resulted in an increase in the production of coal sufficient to encourage hopes among steel makers of being able to obtain normal supplies in the near future and they are indifferent about taking on additional obligations. The most recent sale of sheet bars was at $37.50, and this probably is as low as sheet bars, billets or slabs could be had to-day. A West Virginia sheet maker is in the market for 2000 tons of billets for rolling down to sheet bars or would buy the same tonnage of sheet bars. In general the demand is very light.

We quote 4 x 4-in. soft Bessemer and open-hearth billets at $37.50; 2 x 2-in. billets, $37.50; Bessemer and open-hearth sheet bars, $37.50; slabs, $37.50; forging billets, ordinary carbons, $43 to $45, all f.o.b. Youngstown or Pittsburgh mills.

Wire Rods.—As far as sales for early delivery are concerned, the market is no longer quotable at less than $45 for the base size of common soft rods. Only one producer in this district remains in the market, and this interest recently sold one lot of 500 tons and another of 250 tons at $45. Other producers are shipping as best they can on contracts, but are taking no new business, and the market therefore seems quotable on the basis named by the one producer who remains in the market.

We quote No. 5 common basic or Bessemer rods to domestic consumers, $45; chain rods, $45; screw stock rods, $50; rivet and bolt rods and other rods of that character, $45; high carbon rods, $52 to $55, depending on carbon, per gross ton, f.o.b. Pittsburgh or Youngstown.

Iron and Steel Bars.—Prices have further stiffened on steel bars and those makers in a position to take business for reasonable quick shipments are now quoting from 2c. to 2.25c., base, Pittsburgh. The Steel Corporation price remains at 1.80c. base, Pittsburgh, but such business as is being accepted is for indefinite delivery. Iron bars have been advanced $2 per ton.

We quote steel bars rolled from billets at 1.80c. to 2.25c.; reinforcing bars, rolled from billets, 1.80c. to 2c. base; rail steel reinforcing bars, 1.80c. to 1.90c.; refined iron bars, 2.35c. in carloads, f.o.b. mill, Pittsburgh.

Structural Material.—A considerable volume of structural business remains in sight, but is not being closed with much rapidity because of the uncertainty about delivery. A good many projects already under way are being held up because the fabricating companies are unable to obtain steel promptly. The wage increase just announced by the Steel Corporation will affect fabricating shops and it is claimed will cost the latter heavily on work that remains uncompleted. Orders for plain material now are hard to place at less than 2c. Prices are given on page 507.

Sheets.—Several of the independent manufacturers since a week ago have announced bases of 2.60c. for blue annealed, 3.50c. for black and 4.50c. for galvanized on such business as they can take on for fourth quarter shipment. These prices are $2 per ton over those announced by the American Sheet & Tin Plate Co. on blue annealed and $3 per ton higher on black and galvanized. There has been no formal opening of books for the last quarter, because all makers will carry over much third quarter business and are uncertain at present as to coal and steel supplies. The fourth quarter prices become current quotations in view of the fact that few, if any, of the producers can take on business now for shipment before the fourth quarter. Prices are given on page 507.

Iron and Steel Pipe.—Leading makers of wrought iron pipe, on Aug. 16, issued new cards, dated Aug. 15, advancing prices of standard pipe $10 per ton. This follows closely advances of $4 to $6 per ton announced Aug. 15 by Youngstown Sheet & Tube Co., and since adopted by most other independent producers, but not yet by the National Tube Co. The latter still is on the Dec. 15, 1921, card, quoting 71 per cent off list for the base size of black, and 58½ per cent off list for the base size of galvanized pipe. The Wheeling Steel Products Co., sales subsidiary of Wheeling Steel Corporation, has announced an advance of $8 per ton in all sizes of standard pipe, both black and galvanized. Independent companies generally have advanced line pipe $6 per ton, but none of them yet has issued new discount lists on oil country pipe. Changes of the past

week have resulted in increasing the premium on a standard black wrought iron pipe over steel pipe, from $53 per ton to $57 per ton, in comparison with the new independent discounts, and to $63 per ton as compared with National Tube Co. discount. Quotations given on page 507 represent most of the independent companies in the lower discounts and the National Tube Co. in the higher discounts.

Steel Rails.—Resumption at coal mines as a result of the Cleveland settlement has not yet been extensive enough to have materially stimulated the demand for light rails, but makers are holding firm to recent advances on account of high costs.

We quote 25 to 45-lb. sections, rolled from new steel, 1.90c. to 2c. base; rolled from old rails, 1.80c. to 1.90c. base; standard rails, $40 per gross ton mill for Bessemer and open-hearth sections.

Wire Products.—Recent advance in nails and wire by the Pittsburgh Steel Co. has not been followed by other producers, most of whom are out of the market and are taking on no new business. The scarcity of coal and steel is so great that most of them are behind in their deliveries, and, while the demand is not heavy, it exceeds the supply, and $2.60 base per keg, Pittsburgh, is being paid for nails and $2.35 base per 100-lb. Pittsburgh for plain wire, for specified shipments. For early delivery these prices now are minimums. Quotations are given on page 507.

Boiler Tubes.—No change yet has taken place in lap welded steel or in charcoal iron boiler tubes except that extra discounts beyond the regular ones have been withdrawn by those who recently were giving them. The Detroit Seamless Tubes Co. has increased prices of commercial seamless boiler tubes from $6 to $14 per ton and has cut the discount on seamless mechanical tubing three points, besides revising upward prices of seamless locomotive and superheater tubes. It is probable that other independent makers will follow this advance, but to date the National Tube Co. has made no change. Several of the independent makers are sold up for the remainder of the year, and with these interests the new quotations will be merely quotations. Discounts and prices given on page 507.

Cold-Finished Steel Bars and Shafting.—The fact that hot-rolled steel bars now are not available for early delivery at below 2c. base, Pittsburgh, has found no reflection in prices of cold-finished bars, which remain at 2.25c. base, Pittsburgh, for carload lots. This is a spread of only $5 per ton between hot-rolled and cold-finished bars and, as some shading of 2.25c. is noted on the latter, it is evident that some makers are sharing the advantage of low-priced hot-rolled bars with their customers. Demand is not very brisk. Ground shafting is unchanged at 2.65c., base f.o.b. mill for carloads.

Rivets.—There is no change in prices, but the market is very firm, due to the scarcity of coal and a falling away in deliveries of steel. Since the demand holds strong, higher prices are expected. Discounts and prices are given on page 507.

Track Equipment.—The one maker in this district who still is in the market has further advanced prices on account of the coal and steel shortage. This interest now is quoting large spikes at $2.50 base per 100 lb. and small railroad and boat and barge spikes $3 base per 100 lb. There is not much demand for tie plates in this market, but on account of the steel supply situation, makers regard $45 per net ton to be as low as they should sell. Prices are given on page 507.

Steel Skelp.—It is doubtful if any of the independent makers to-day would consider less than 2c. for sheared skelp and that price is as low as grooved material can be bought.

Tin Plate.—There seems to be a slightly firmer tendency to prices, but this is apparent in the withdrawal of preferential quotations to preferred customers rather than in an actual advance in prices. Mills are comfortably well off on orders, but current demands are not urgent.

Hot-Rolled Flats.—Independent makers have generally advanced the price $5 per ton to a base of 2.75c. Pittsburgh. So far the Steel Corporation has not met this change, but is so heavily committed as to be only a small factor as far as prompt tonnages are concerned. Its last price was 2.50c. As the cotton crop is turning out in excess of early estimates, there are demands for additional tonnages of cotton ties.

Cold-Rolled Strips.—In keeping with the advance in hot-rolled strips, independent makers have marked up the price of cold rolled strips $5 per ton to a base of 4.25c., Pittsburgh. Demand is reported to be heavier than it was recently, and this price also is based upon higher labor, steel and fuel costs.

Independent makers in a position to make specified deliveries are quoting 2c. to 2.25c., Pittsburgh, and because of the increase in wages there is talk already of an advance in independent prices to 2.50c. Tank builders are seeking protection on considerable tonnage for oil storage tanks for the Southwest. Prices are given on page 507.

Nuts and Bolts.—Makers in this district are having trouble in getting enough fuel to keep up with their orders and with an increased labor cost immediately ahead, there are suggestions of an advance in prices. Discounts are given on page 507.

Coke and Coal.—A fairly substantial gain in production, coupled with the fact that buyers have been hesitant about purchases pending the results of the Cleveland conference, has weakened prices rather sharply. On coal, the market has fallen from $7.50 to $8 per net ton at mines, to $5.50 to $6, while furnace coke for spot delivery has dropped to $12 per net ton at oven as compared with $14 last week's minimum. Foundry coke is still held by some producers at $14 per net ton at oven, but on sales the market generally is quotable at $13.

Old Material.—The market trend is upward and on heavy melting steel of railroad or industrial origin the range now is $18.25 to $18.50, based on recent sales to a Pittsburgh district steel company, which in all took 10,000 tons at those prices. Sales of yard heavy melting steel have been made anywhere from $16.50 to $17.50. For the present, a distinction is necessary to clearly define the market on this class of material. This will disappear when the mills are more eager for supplies and less exacting about quality than they are now. At present the mills must pay a premium for quality scrap because dealers are not inclined to sell yard stocks, since they expect higher prices later and the railroads are not pressing tonnages upon the market. Current offerings, therefore, are moderate. Improvement in prices of rerolled bars and rails has stiffened the market on rails for rerolling. Although only one user of machine shop turnings in this district is in the market, the price is firmer, due to the fact that Eastern shippers lately have been getting as high as $14, Harrisburg, this being equal to at least $15 Pittsburgh, and of course shutting off Eastern shipments to this market. Scant offerings rather than a brisk demand sustain sheet scrap prices.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

	Per Gross Ton	
Heavy melting steel, railroad and industrial	$18.25 to	$18.50
Heavy melting steel, yard	16.50 to	17.50
No. 1 cast, cupola size	19.00 to	19.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va.; Franklin, and Williamsport, Pa.	18.00 to	18.50
Compressed sheet steel		16.00
Bundled sheet sides and ends		15.00
Railroad knuckles and couplers	19.00 to	19.50
Railroad coil and leaf springs	19.00 to	19.50
Low phosphorus standard bloom and billet ends	22.00 to	22.50
Low phosphorus, plates and other grades	20.00 to	20.50
Railroad malleable	16.00 to	16.50
Iron car axles	27.00 to	28.00
Locomotive axles steel	25.00 to	26.00
Steel car axles	20.00 to	20.50
Cast iron wheels	19.50 to	20.00
Rolled steel wheels	19.00 to	19.50
Machine shop turnings	14.00 to	14.50
Heavy steel axle turnings	15.50 to	16.00
Short shoveling turnings	15.50 to	16.00
Cast iron borings	16.00 to	16.50
Heavy breakable cast	18.50 to	19.00
Stove plate	14.50 to	16.00
Sheet bar crop ends	19.50 to	20.00
No. 1 railroad wrought	15.50 to	16.00

Chicago

Advancing Pig Iron and Steel Prices with Further Curtailment of Output

CHICAGO, Aug. 22.—The fuel situation is now on the road to improvement as a result of the partial settlement of the strike last week at Cleveland and the agreement signed by Illinois operators and miners in Chicago to-day. The shortage of coal, however, is still acute so far as iron and steel works are concerned and relief will depend entirely upon the rapidity with which the production of the mines is resumed and the dispatch with which railroads handle shipments. In the meantime the Illinois Steel Co. has been forced to bank four more blast furnaces, two at Gary and two at South Works. This producer now has only 9 active stacks out of 29. Of the 10 other furnaces still in blast in the Chicago, Milwaukee and Duluth districts, five are merchant stacks. Steel output has also suffered further curtailment. The production of the Illinois Steel Co., which was on a 67 per cent basis last week, has dropped to 52 per cent. The Inland Steel Co. is still maintaining a 65 per cent rate of output, but a reduction will prove unavoidable if additional coal is not obtained by Sept. 1.

Buying of steel for indefinite delivery shows little diminution. Steel for early delivery is difficult to obtain and is commanding premiums. Little is available from local sources, but whether it is bought here or from Eastern mills, prices are higher and advancing. On plates, shapes and bars 2.35c., Chicago, is about the best that can be done, with considerable business moving at $2 to $3 higher. The Inland Steel Co. is out of the market on plates, shapes, bars and sheets, but expects to open its books for the last two months of the year as soon as costs can be determined with reasonable certainty.

Ferroalloys.—Sales of spiegeleisen and ferromanganese have been confined to carload lots. Spiegeleisen has advanced to a minimum of $49, delivered. Sales of prompt ferromanganese have been closed at as low as $70 seaboard.

We quote 78 to 82 per cent ferromanganese, future, $75.06; prompt, $77.56 to $82.56, delivered; 50 per cent ferrosilicon, $55, delivered on contract and $57 prompt delivery; spiegeleisen, 18 to 22 per cent, $47 to $49, delivered.

Pig Iron.—While there have been no further losses in merchant pig iron production in the past week, a number of blast furnaces are about to run out of coke and will be forced to bank unless additional coal is obtained. A prompt resumption of mining in the Illinois bituminous fields may relieve the situation soon enough to tide them over, although the production of coke requires the use of large percentage of low volatile coal, shipments of which are moving slowly because of railroad difficulties between here and Eastern mines. Spot demand for pig iron is very active and in some cases melters are running dangerously short of metal. Forward buying is less conspicuous. A Wisconsin manufacturer of sanitary ware, however, has closed for 5000 tons of Southern foundry iron for fourth quarter delivery and another melter in that State has bought 500 tons of Northern foundry for the remainder of the year. Among sales for early shipment, 500 tons of malleable bought by a Michigan user for August and September delivery is prominent. Southern iron for early shipment is difficult to obtain owing to freight congestion in the South. Southern prices are uncertain because most furnaces have temporarily withdrawn from the market. Quotations of $22, Birmingham, for early shipment and $21 for fourth quarter are still reported, however. Charcoal iron is advancing, one important producer having raised the base quotation to $31.50, furnace, while others have gone up to $33, base. The demand for silvery is heavy both because of its relative lowness compared with standard foundry iron and the greater use of scrap by melters. With Jackson County producers out of the market, silvery is scarce, although it can still be obtained from electrolytic makers. There is also a dearth of low phosphorus iron and copper free material has advanced to $38, Valley furnace. On the eve of the advance in charcoal iron a Wisconsin melter closed for 1000 tons for the rest of the year at the old base of $30 furnace.

Quotations on Northern foundry, high phosphorus malleable and basic irons are f.o.b. local furnace and do not include a switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards, or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$34.65 to $36.15
Northern coke, No. 1, sil. 2.25 to 2.75	31.00
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	30.00
Northern high phos	30.00
Southern No. 2	27.00 to 28.00
Malleable, not over 2.25 sil	30.00
Basic	30.00
Low phos. Valley furnace, sil. 1 to 2 per cent copper free	38.00
Silvery, sil. 8 per cent	40.79

Bars.—New business in mild steel bars for indefinite shipment shows little diminution and demand for early delivery is incessant as the scarcity of material becomes more pronounced. Prices on material for specific shipment range from 2.35c. to 2.45c., Chicago. Buyers with bars on contract are receiving their share of present reduced output as apportioned by the mills. The situation in bar iron is strong with one mill taking no further orders and preparing to shut down in about a week when its coal supply is used. The Moline rail steel bar plant has advanced its product to 1.85c., f.o.b. mill, or 2.095c., delivered Chicago. The strike-bound Chicago Heights mills still have some hard steel in stock which they are quoting at 2c., Chicago.

Mill prices are: Mild steel bars, 1.90c. to 2.45c., Chicago; common bar iron, 2.15c. to 2.25c., Chicago; rail steel, 2c. to 2.005c., Chicago.

Jobbers quote 2.70c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.70c. for rounds and 4.20c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 2.50c. base; hoops, 3.70c.; bands, 3.45c.

Bolts and Nuts.—Automobile makers and railroads continue to buy liberally and makers find it difficult to meet the demand owing to raw material shortage, which is reducing production. The market is firm at the July 1 discounts. The prices on page 507 apply in this territory except that they are f.o.b. Chicago, instead of f.o.b. Pittsburgh.

Jobbers quote structural rivets, 3.35c.; boiler rivets, 3.45c.; machine bolts up to ⅞ x 4 in., 50, 10 and 10 per cent off; larger sizes, 50 and 10 off; carriage bolts up to ⅞ x 6 in., 50 and 5 off; larger sizes, 45 off; hot pressed nuts, squares and hexagons, tapped, $3.25 off; blank nuts, $3.50 off; coach or lag screws, gimlet points, square heads, 60 per cent off; quantity extras are unchanged.

Wire Products.—Mill operations have declined so sharply that a number of important producers find it impossible to take care of commitments without accepting new business. The Steel Corporation prices remain unchanged, but independents in a position to make delivery are selling at higher figures without difficulty. For mill prices see finished iron and steel, f.o.b. Pittsburgh, page 507.

We quote warehouse prices, f.o.b. Chicago: No. 9 and heavier black annealed wire and No. 9 and heavier bright basic wire, $3.25 per 100 lb.; common wire nails, $3.35 per 100 lb.; cement coated nails, $2.75 per keg.

Sheets.—Prices are now firmly established at the figures announced for fourth quarter by the American Sheet & Tin Plate Co. It is difficult to get material from any source for reasonably prompt delivery. The Inland Steel Co. still has some fourth quarter tonnage open, but will not take on new commitments until its fuel costs can be determined.

Mill quotations are 3.35c. for No. 28 black, 2.50c. for No. 10 blue annealed and 4.35c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote blue annealed, 4c.; black, 4.85c.; galvanized, 5.85c.

Structural Material.—There is a notable decline in new building projects attributable, no doubt, to the approach of the winter season together with the great difficulty encountered in getting new steel for reasonable delivery. Fabricating awards are still fairly numerous and mills report no appreciable decline in bookings of plain material for indefinite shipment. A tendency toward contraction in building activity is nevertheless apparent. Plain material for reasonably early delivery is bringing from 2.35c. to 2.45c., delivered Chicago. The steady reduction in local mill output is causing further delay in shipments against contracts. The Inland Steel Co., which is now out of the market

on structural steel plates and bars, will open its books for the last two months of fourth quarter as soon as fuel costs can be ascertained with a fair degree of certainty.

The mill quotation on plain material is 1.90c. to 2.45c., Chicago. Jobbers quote 2.80c. for plain material out of warehouse.

Plates.—Notwithstanding declining mill operations which will push deliveries further into the future, bookings of new business for indefinite shipment are practically as heavy as in the eight weeks just past. Plates for specific shipment are scarce and are commanding from 2.20c. to 2.50c., delivered Chicago. Specifications are beyond the ability of mills to deliver with the result that output is being rationed among customers.

The mill quotation is 1.90c. to 2.50c., Chicago. Jobbers quote 2.80c. for plates out of stock.

Reinforcing Bars.—Uncertain mill deliveries make it difficult for reinforcing bar companies to quote on new projects or to make further sales from warehouse. There is an active demand for small tonnages, but as fall approaches it is notable that few large jobs are being undertaken, as there is a disinclination to start building work which might be interrupted by the cold weather. Recent awards include:

American Can Co., building, New Orleans, La., 772 tons to Paul J. Kalman Co.

Streeterville apartment hotel, Chicago, 594 tons to unnamed company.

Atchison, Topeka & Sante Fe, 400 tons to Paul J. Kalman Co.

Hampshire Spinning Co., mill, Clover, S. C., 350 tons to Paul J. Kalman Co.

Pending work includes:

Western Electric Co., wire plant, Hawthorne, Ill., 280 tons.

Chesbrough Mfg. Co., plant, McKee's Rocks, Pa., plans being revised, 600 tons.

Paducah, Ky., sanitary sewers, 260 tons, to Truscon Steel Co.

Warehouse Prices.—Local jobbers have advanced plain wire and wire nails 25c. per 100 lb. and cement coated nails 15c. a keg. New prices are given under wire products. Sheets have been advanced also, blue annealed $2 a ton and black and galvanized $5 a ton. New prices are published under sheets.

Cast Iron Pipe.—Prices have advanced to a minimum of $38.50, base Birmingham, for 6-in. and larger. Martinsville, Ill., has awarded 600 tons to the American Cast Iron Pipe Co. New business is notably lighter, but this is causing little concern to pipe shops, which are heavily loaded with tonnage.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $50.70 to $51.70; 6-in. and above, $46.70 to $47.70; class A and gas pipe, $3 extra.

Rails and Track Supplies.—A number of large western railroads have quietly put out inquiries for their 1923 rail requirements. It is altogether likely that rail orders for the coming year will be placed earlier than is usually the case in view of the present condition of the steel market. Light rails have advanced to 1.90c., mill. Inquiry for light rails for the coal mines is reviving. New business in track fastenings is largely in small lots, a notable exception being an order for 20,000 kegs of spikes and 10,000 kegs of bolts placed by a large Western line.

Standard Bessemer and open-hearth rails, $40; light rails rolled from new steel, 1.90c., f.o.b. makers' mills.

Standard railroad spikes, 2.60c. to 2.75c., mill; track bolts with square nuts, 3.60c. to 3.75c., mill; tie plates, steel and iron, 2c., f.o.b. mill; angle bars, 2.40c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.40c. base and track bolts 4.40c. base.

Old Material.—The market is strong both on account of widespread demand and increasing scarcity of certain grades due to the lack of railroad offerings. Buying of cast, malleable and steel foundry scrap is particularly active and in most cases early delivery is desired. There is no doubt that the rapid rise of pig iron has made scrap appear more desirable in the eyes of melters, who see an opportunity to keep their costs down by using a larger proportion of scrap in their charges. There is little activity in steel mill grades, but moderate purchases of iron mill scrap have been made. Shipments of scrap are now largely from dealers' yards with the result that stocks of certain materials are becoming depleted. There are no railroad offerings of consequence this week, but the Chicago surface lines are taking bids on 1500 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton	
Iron rails	$20.00 to	$20.50
Cast iron car wheels	21.00 to	21.50
Relaying rails	22.50 to	27.50
Rolled or forged steel car wheels	19.50 to	20.00
Rails for rolling	17.00 to	17.50
Steel rails, less than 3 ft	19.00 to	19.50
Heavy melting steel	16.00 to	16.50
Frogs, switches and guards cut apart	16.00 to	16.50
Shoveling steel	15.50 to	18.00
Drop forge flashings	11.50 to	12.00
Hydraulic compressed sheet	13.00 to	13.50
Axle turnings	14.00 to	14.50
	Per Net Ton	
Iron angles and splice bars	T9.00 to	19.50
Steel angle bars	15.50 to	16.00
Iron arch bars and transoms	19.50 to	20.00
Iron car axles	23.50 to	24.00
Steel car axles	17.00 to	17.50
No. 1 busheling	13.00 to	13.50
No. 2 busheling	8.00 to	8.50
Cut forge	14.50 to	15.00
Pipes and flues	11.00 to	11.50
No. 1 railroad wrought	15.25 to	15.75
No. 2 railroad wrought	14.50 to	15.00
Steel knuckles and couplers	17.50 to	18.00
Coil springs	18.50 to	19.00
No. 1 machinery cast	19.50 to	20.00
No. 1 railroad cast	17.50 to	18.00
Low phos. punchings	16.00 to	16.50
Locomotive tires, smooth	15.00 to	15.50
Machine shop turnings	9.50 to	10.00
Cast borings	11.50 to	12.00
Stove plate	16.00 to	16.50
Grate bars	15.50 to	16.00
Brake shoes	16.00 to	16.50
Railroad malleable	17.50 to	18.00
Agricultural malleable	17.50 to	18.00

New York

Conditions Favor Continuance of High Prices —Coke Still Scarce

NEW YORK, Aug. 22.—The action of the United States Steel Corporation in advancing wages 20 per cent is regarded as adding one more factor of importance in keeping prices on a high plane. It is also believed that despite the partial settlement of the coal strike, iron and steel industries will continue to be seriously embarrassed for lack of fuel and for this reason high prices will prevail.

Pig Iron.—The market has been very active and a number of important inquiries are still pending. The domestic supply is not equal to the demand and foreign iron is still being considered by buyers, but sales of the imported product have not been large the past week. A local agency selling domestic iron disposed of about 3000 tons last week and an equal amount the first two days of this week, and has advanced prices $1 per ton, its basis now being $32 for No. 2 plain, while $33 is asked for No. 2X and it is offering a moderate tonnage of 4 per cent silicon iron for $36. Inquiries include 5000 tons for the American Radiator Co., which asks for the beginning of deliveries within two weeks. On this tonnage 3500 is No. 2 plain and 1500 is of silicon, 1.50 to 1.75. The General Electric Co. is inquiring for 3250 tons of foundry grades, high silicon, delivery to begin Oct. 1. A Rhode Island malleable concern is in the market for 3000 tons of malleable and another New England malleable interest has been in the market for from 2000 to 3000 tons and has purchased a part, if not all, of that tonnage. The ruling price on malleable is $32, furnace. A New England radiator company is in the market for 2000 to 3000 tons of foundry grades. Lake Superior charcoal has been advanced by one company to a basis of $33, furnace.

We quote delivered in the New York district as follows, having added to furnace prices $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$36.27
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	35.27
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	34.27
Buffalo, sil. 1.75 to 2.25	34.91
No. 2 Virginia, sil. 1.75 to 2.25	32.44

Ferroalloys.—Demand for ferromanganese continues moderate and fair sales of the British alloy are noted, among them being one lot of 500 tons and several other smaller lots for September shipment at the

prevailing quotation of $67.50, seaboard. British representatives still have some September shipment available. Almost nothing is heard of sales of domestic alloy. Some business has been done in the 20 per cent grade of spiegeleisen at the new price of $39, furnace. The quotation of the lower grade is nominal at $38, furnace, but scarcely any is reported offered. The 50 per cent ferrosilicon market is characterized by heavy specifications on contracts made some time ago and there are only sales of spot and early delivery lots at $55 to $60, delivered. The ferrochromium market is quiet, but specifications on contract are fairly brisk. Quotations are as follows:

Ferromanganese, domestic, seaboard, per ton	$67.50
Ferromanganese, British, seaboard, per ton	$67.50
Spiegeleisen, 17 to 19 per cent, furnace	$38.00
Spiegeleisen, 20 per cent, furnace	$39.00
Ferrosilicon, 50 per cent, delivered, per gross ton, carloads	$55.00 to $60.00
Ferrosilicon, 10 to 15 per cent, delivered, per gross ton	$38.00 to $40.00
Ferrotungsten, per lb. of contained metal	40c. to 50c.
Ferrochromium, 4 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr., delivered	12c. to 14c.
Ferrovanadium, per lb. of contained vanadium	$3.00 to $3.50
Ferrocarbontitanium, 15 to 18 per cent, in carloads, per net ton	$200.00
Ores	
Manganese ore, foreign, per unit, seaboard	28c. to 30c.
Tungsten ore, per unit, in 60 per cent concentrates, nominal	$3.25 up
Chrome ore, basis 48 per cent Cr_2O_3, crude, per ton, Atlantic seaboard	$15 to $18.50
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	45c. to 50c.

Cast Iron Pipe.—The city of Poughkeepsie has placed an order for 2700 tons of 24 and 30-in. pipe with the Warren Foundry & Machine Co. in competition with steel pipe. The East New Jersey Pipe Co. submitted a bid of $105,516 on steel pipe and the Warren Foundry & Machine Co. was $27,000 higher. Woonsocket, R. I., is inquiring for 2000 tons. We quote per net ton f. o. b., New York, in carload lots, as follows: 6-in. and larger, $54.50; 4-in. and 5-in. $59; 3-in. $64.80, with $4 additional for Class A and gas pipe.

Warehouse Business.—Business is fairly active in most quarters with prices holding generally firm. An advance of $6 per ton on black steel pipe and $2 on galvanized pipe by the mills resulted in a corresponding increase in warehouse prices as noted elsewhere in this issue. The prices on wrought-iron pipe for the present remain unchanged. However, change has been noted in the price of boiler tubes from stock, which now ranges from 23c. per foot for lapwelded and 21c. for seamless steel in 1¾ in. size, to 39c. for lapwelded and 43c. for seamless in 4 in. size. Further reduction of output and continued strong demand are expected to bring further price advances in bars, shapes and plates. A better volume of business is expected upon settlement of the strikes. It is felt by the trade that increased business will be showing after Labor Day.

High Speed Steel.—Business is fairly active, but there is no marked improvement over last week. Considerable business continues despite the threatening effect of the strikes. Prices remain steady.

Finished Iron and Steel.—The tight mill situation, due to coal and coke shortage, is making it very difficult for consumers to buy. The latter seem to have fully appraised the seriousness of the situation, but instead of crowding the mills to accept orders, as is usually the case in a time of stress, they are showing a marked degree of moderation. Evidently the memories of the wave of over-buying in 1919 and 1920 are too fresh to encourage a repetition of that runaway market. While relatively high prices have been paid for steel, particularly for plates, shapes and bars, it is of interest that nearly all of the orders placed at the top figures have been for small tonnages, and there has been no great number of such orders. The price situation is wholly in the hands of the producers, with the buyers bidding quotations up to a slight extent. Some of the Eastern mills are in better position with respect to their ability to fill orders than mills in the Pittsburgh-Youngstown district, most of which are selling little or nothing. The mills which are operating the most successfully are, of course, getting the most inquiries. A central Pennsylvania plate mill operating on fuel oil has broken all of its production records so far this month and is taking orders from regular customers for shipment within a few weeks. Large buyers of plates have not been able to get their orders accepted at less than 2c., Pittsburgh, and some quotations are as high as 2.25c. The same range applies also to bars and shapes. Tin plate and cold finished steel bars are less affected by the present coal and rail situation than other products. Tin plate prices have not stiffened materially and large buyers are still able to place attractive orders at not over $4.60 per base box, Pittsburgh. A large can company has bought fully 50,000 base boxes of tin plate within the past week and is still buying. The fruit and vegetable crops throughout the country are the largest in many years and are from two to four weeks earlier in maturing than usual. Due to the rail situation making shipping difficult, a larger share of such farm products will be canned this year.

We quote for mill shipments, New York delivery, as follows: For indefinite delivery soft steel bars, structural shapes and steel plates, 2.14c.; for delivery in a number of weeks, soft steel bars, plain structural material and steel plates, 2.34c. to 2.59c.; bar iron, 2.34c.

Coke.—Although the market seems to be somewhat easier as to obtaining supplies, prices are about the same, being on Connellsville grades $14.25 to $14.75 for furnace coke and $15.50 to $16.50 for foundry. For by-product coke, $15, seaboard, is quoted and there is very little to be obtained for foundries owing to priority orders requiring shipments to hospitals and utility companies. The outlook is very unsatisfactory for obtaining adequate supplies any time in the near future.

Old Material.—A better demand for scrap from mills and foundries and a stronger tone to prices are developments of the past week. The Bethlehem Steel Co. has bought between 20,000 and 30,000 tons of steel scrap, paying $15 and $15.50, delivered Bethlehem. Dealers have paid as high as $12.85, New York, for shipment on these orders. Yard steel is not particularly in demand, as mills are specifying only the best quality of railroad steel or its equivalent. Iron car axles, No. 1 railroad wrought, wrought iron track, borings and turnings and other grades are all quoted higher. For shipment to Weirton, W. Va., $15, delivered, has been offered for blast furnace borings and turnings. Local foundries are buying cast scrap a little more liberally due to the scarcity and high prices of pig iron. While $20, delivered, has been paid recently by large eastern Pennsylvania and New Jersey foundries, local melters have not been obliged to pay more than $18.50 to $19.50.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard	$10.25 to $10.75
Steel rails, short lengths, or equivalent	12.25 to 12.75
Rerolling rails	12.50 to 13.00
Relaying rails, nominal	27.00 to 28.00
Steel car axles	17.00 to 18.00
Iron car axles	23.00 to 24.00
No. 1 railroad wrought	13.00 to 13.50
Wrought iron track	11.75 to 12.25
Forge fire	8.00 to 8.50
No. 1 yard wrought, long	11.00 to 11.50
Cast borings (clean)	10.75 to 11.25
Machine-shop turnings	9.25 to 10.25
Mixed borings and turnings	9.25 to 10.25
Iron and steel pipe (1 in. diam., not under 2 ft. long)	9.75 to 10.25
Stove plate	11.25 to 11.75
Locomotive grate bars	11.50 to 12.00
Malleable cast (railroad)	11.00 to 11.50
Cast-iron car wheels	13.50 to 14.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast	$18.50 to $19.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	16.50 to 17.00
No. 1 heavy cast, not cupola size	14.00 to 14.50
No. 2 cast (radiators, cast boilers, etc.)	12.00 to 12.50

The Interstate Commerce Commission in a decision based on the complaint of the Standard Rail & Steel Co., St. Louis scrap dealer, against the Missouri Pacific, et al., has condemned rates on scrap iron and steel from Hot Springs and Pine Bluff, Ark., to Quincy, Ill., to the extent that they exceed the combination based on St. Louis.

Birmingham

BIRMINGHAM, ALA., Aug. 22.—The absolute minimum in the Birmingham iron market to-day is $21. Lot on lot from car loads to 200 tons has been sold in the past two days for spot and fourth quarter delivery at $25. These bookings have been made by the largest foundry maker heretofore selling at the lower prices. One thousand tons of Birmingham iron stored at Providence, R. I., brought $35 at Providence yards. Only one maker quotes as low as $21 and that is one booked to capacity for the remainder of the year and accommodating only preferred customers to the extent possible. Next to the largest maker said this morning, "I would not sell even at $24. The market is very nervous and jumpy."

Pig Iron.—At the close of the past week, Birmingham spot iron was on a base of $21 and fourth quarter iron on a base of $20, the latter tending to advance. One maker booked 6000 tons of fourth quarter iron during the week at $20. The lots ran from 100 to 2000 tons. Another maker booked spot iron in car lots and up to 200 tons at $21. The $20 base was paid by large interests able to command the lowest base price and their paying $20 established that as the base. Approximately 2000 tons of northern Alabama iron on yards at Providence, R. I., brought $30, which is the equivalent of a Birmingham base of $20.40. One maker declined during the week to make any bookings for delivery prior to Nov. 15 and another would book none prior to Oct. 15. One maker is sold to capacity through the fourth quarter except for grades that may develop in the making. Production, which was increased by the blowing in of two blast furnaces in July, was further augmented by the blowing in of the blast furnace of the Central Coal & Iron Co. at Holt on Monday. This stack has been overhauled and is now ready for a long run. With the going in of this plant all operations of the Iron Products Corporation in Alabama were practically at 100 per cent, coal and coke included. Stocks have not accumulated as heavily as was thought probable owing to the nearness of Southern consumers and the enormous amount of iron which they continue to melt. No iron and steel industries have slackened pace, raw materials coming handily on account of being on company lands and, in some instances, hauled by company motive power and cars. The Warrior River has helped the raw material situation by bringing in manganese ore from Brazil, sulphur for acid mills from Texas and Chilean nitrates for powder mills, the river barges enabling an all-water route.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	$21.00 to $25.00
Basic	19.50 to 20.00
Charcoal, warm blast	30.00 to 32.00

Finishing Mills.—All finishing mills maintain the pace of July 1. The Tennessee company, as usual, is on double turn at Fairfield, Ensley and Bessemer mills this week. The rail mill is turning out 9000 to 10,000 tons and the ingot mill is at 100 per cent. The car plant is turning out 15 new cars and 12 repaired ones per diem. Progress is made on the new 10 and 12-in. bar mill at Fairfield. The Gulf States Steel Co., the American Steel & Wire Co. and the Conners Steel Co. continue on full turn in finishing departments, although the product is being piled owing to car shortage. China has ordered 50 tons of steel hoops. Shipments to the Pacific Coast out of Mobile last week included nails and wire.

Cast Iron Pipe.—J. R. McWane, president, announces the purchase by the McWane Cast Iron Pipe Co. of 30 acres in North Birmingham and immediate construction of a cast iron pipe plant with initial capacity of 8000 ft. per diem and employing 150 men to begin with in the first unit. Mr. McWane is one of the founders and for a long time was president of the American Cast Iron Pipe Co. He has made a marked success this year in a leased plant in the manufacture of smaller sizes of pressure pipe running from 6 to 1¼ in. An especially good business has been done with the Pacific Coast and Honolulu. Pressure pipe is still quoted at $37 and sanitary pipe at $60 to $65. Little new business has developed, but all plants are on full turn with enough business for several months.

Coal and Coke.—The Western demand for Alabama coal remains acute and production remains at 400,000 tons a week. Prices have ranged from $3 to $3.50 on the average for this spot business with some coal going higher. Spot coke is selling at $6 and $7 and some higher still. Production bids fair to remain at the present prices and high level for some time.

Old Material.—There is an active demand for cast scrap by the foundries and the market is firm at the prices quoted. Steel is also stronger with fancy and select cupola grades selling at as high at $15.50 to $16 at yards. No. 1 steel as a rule is bringing $12 to $14, according to tonnage involved.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails	$13.00 to $15.00
No. 1 steel	12.00 to 15.00
No. 1 cast	15.00 to 16.00
Car wheels	15.00 to 16.00
Tramcar wheels	14.00 to 15.00
Stove plate	13.00 to 14.00
Cast iron borings	6.00 to 7.00
Machine shop turnings	4.00 to 5.00

Buffalo

BUFFALO, Aug. 22.—The Lackawanna Steel Co. has banked another furnace and now has but one in blast. In a total of 9000 tons of pig iron inquired for with one interest, one inquiry is for 5000 tons, from outside the district, and others are for 1500 and 600 tons. Lackawanna Steel Co. and the Donner Steel Co. have three open hearths each in operation. The Lackawanna furnaces are burning oil.

Pig Iron.—There is no effect in this district as yet from the partial settlement of the strike of bituminous coal miners. Furnace interests generally feel pessimistic about the fuel situation for the remainder of the year. There is little likelihood that any of the furnaces recently banked will be started within 60 days. Prices on pig iron depend on the urgency confronting the consumer and his ability to place his order. On No. 2 plain iron $32 has been paid in several cases and $33 has been done on isolated transactions. The one furnace which had iron to sell while competitors were doing no business has now exhausted its supply on all grades except No. 2 plain and No. 2X. There is a lively demand for No. 1X iron. Sales continue to be for small quantities—the largest in the week not exceeding 200 tons.

We quote f.o.b. per gross ton Buffalo as follows, the higher prices being for early shipment:

No. 1 foundry, 2.75 to 3.25 sil.	$32.00 to $36.00
No. 2X foundry, 2.25 to 2.75 sil.	31.00 to 35.00
No. 2 plain, 1.75 to 2.25 sil.	30.00 to 34.00
Basic	26.00
Malleable	30.00
Lake Superior charcoal	33.28

Finished Iron and Steel.—Two local interests having black sheets for sale have advanced prices and are now quoting 3.50c. base. One independent made two advances within the week and both sellers booked considerable business on the new basis. It is still possible to buy occasional quantities of bars at the minimum price of 2c. No effect from the settlement of the bituminous coal strike is noticeable; in fact, a local mill paid the highest price for coal this year since the settlement of the differences between operators and miners. Inquiry in the structural field has fallen off and no resumption is expected the remainder of this year. There has been no further curtailment of steel mill operations.

Warehouse Business.—Prices have advanced in keeping with the general advance in warehouse schedules at other centers; local warehouses do not regard the increase as being in keeping with mill advancements. There is considerable difficulty encountered by warehouses in obtaining steel.

We quote warehouse prices, Buffalo, as follows: Structural shapes, 2.90c.; plates, 2.90c.; soft steel bars, 2.80c.; hoops, 3.70c.; bands, 3.55c.; blue annealed sheets, No. 10 gage, 3.90c.; galvanized steel sheets, No. 28 gage, 5.55c.; black sheets, No. 28, 4.55c.; cold rolled round shafting, 3.80c.

Old Material.—Mills are buying small lots of steel

and there is a general impression that larger orders would be placed if a break should occur in the price of heavy melting steel. There is a strong local demand for railroad malleable, No. 1 machinery cast, and car wheels, but the market for cast iron borings is practically at a standstill, due to blast furnace operations having been curtailed. Dealers believe that settlement of the various strike disturbances would bring about a big demand for all grades of old material and a consequent advance in prices.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel	$16.75 to $17.00
Low phos., 0.04 and under	18.00 to 19.00
No. 1 railroad wrought	16.00 to 16.50
Car wheels	17.00 to 18.00
Machine shop turnings	10.50 to 11.00
Cast iron borings	14.00 to 14.50
Heavy axle turnings	14.00 to 14.50
Grate bars	14.00 to 14.50
No. 1 busheling	15.00 to 15.50
Stove plate	15.00 to 15.50
Bundled sheet stampings	11.50 to 12.00
No. 1 machinery cast	18.50 to 19.50
Hydraulic compressed	15.00 to 15.50
Railroad maalleable	18.00 to 19.00

Boston

Increased Demand for Alabama Iron—Scotch Prices Advance

BOSTON, Aug. 22.

Pig Iron.—Sales of foreign iron in this territory the past week amounted to about 4000 tons, mostly Scotch for August and September shipment. The outstanding feature of the market, however, is the increased demand for Alabama iron. Alabama iron, f.o.b. Providence, R. I., has advanced from $30 to $35 a ton base, with sales the past week including 500 tons silicon 2.75 to 3.25 to a Providence foundry, a duplicate lot to another Providence melter, 300 tons No. 2 plain to a Massachusetts heater maker, 150 tons No. 1X to a Massachusetts stove maker, 150 tons No. 2X to a Hartford, Conn., machine tool builder, and 200 tons in carload lots to various small users. Quotations are out on an additional 1000 tons, which, if closed, will reduce Providence stocks of Alabama iron to about 3000 tons, as against 8000 tons plus on Aug. 1. Another Alabama furnace sold 1500 tons of fourth quarter iron in lots ranging from cars to 300 tons, at $20 furnace base. No. 3 Scotch sold at prices ranging from $28.50 to $33 on local dock. The lowest available Scotch iron to-day is $29, consequently the market is 50c. to $1 a ton higher. Local brokers are buying foreign irons from each other. A small tonnage of French iron was landed here the past week.

We quote delivered prices, on the basis of the latest reported sales, now infrequent, and as follows, having added to furnace prices $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75	$32.15 to $34.15
East. Penn., sil. 1.75 to 2.25	31.65 to 33.65
Buffalo, sil 2.25 to 2.75	30.41 to 31 41
Buffalo, sil. 1.75 to 2.25	29.91 to 30.91
Alabama, sil. 2.25 to 2.75	29.60 to 30.10
Alabama, sil 1.75 to 2.25	29.10 to 29.60

Warehouse Business.—Local warehouse prices on galvanized and black sheets and on special plates in stock sizes have been advanced 25c. per 100 lb., and on cold rolled steel 15c., while everything else on the list with the exception of best refined, Wayne and Norway iron and toe calk steel, has gone up 10c. Small rounds, bands and light bars and angles are in small supply, but heavier material supplies are ample for requirements during the next two months or more. The demand for iron and steel is as active as at any previous time this year. The advance in independent mill prices on nails is not reflected in jobbing quotations. Large rivets are more active, and bolts and nuts are moving in normal quantities. Prices for these products are unchanged, but very firm.

Jobbers quote: Soft steel bars, $2.85½ per 100 lb. base; flats, $3.50½; concrete bars, $3 to $3.13; structural steel, $2 85½ to $3.05½; tire steel, $4.25 to $4.60; open-hearth spring steel, $4.50 to $6; crucible spring steel, $11.50; steel bands, $4; hoop steel, $4.50; cold rolled steel, $3.65 to $4.15; refined iron, $2.85½; best refined iron, $4.25; Wayne iron, $5.50; Norway iron, $6 to $6.50; plates, $2.95½ to $3.15; No. 10 blue annealed sheets, $4 per 100 lb. base; No. 28 black sheets, $5.15; No. 28 galvanized sheets, $6.15.

Coke.—The New England Coal & Coke Co. and the Providence Gas Co. continue to quote by-product contract foundry coke at $16.50 a ton delivered where the local freight does not exceed $3.10. The market for spot fuel is nominal, both producers being out of the market. The aggregate shipments of contract fuel by these two concerns the past week show improvement, but have remained behind foundry shipping instructions. Contrary to report, no foundry in New England has been obliged to close for lack of fuel. Competition from English made foundry coke continues, a further sizable tonnage reported being sold on a delivered basis slightly above the domestic.

Old Material.—The market for old material is a little more active, but business centers largely in heavy melting steel and borings and turnings. A considerable tonnage of railroad heavy melting steel was purchased in this territory the past week at around $11.50 shipping point for Pittsburgh district mills. Offers were made yesterday at $12, but that price has not become general, and the material involved is strictly No. 1. The undertone of the market for heavy melting steel, however, unquestionably is firmer. Borings and turnings also are being taken for shipment to the Pittsburgh district. Prices take a wide range owing to material involved. The best grades are taken at $9 to $9.50 on cars shipping point, but where considerable bushing is involved, the average price is around $8.75. A fair demand for shafting continues, a Portland, Me., rolling mill still being a factor. Steel car axles are firmer, dealers having paid about $2 a ton more for them than for shafting. One broker reports sales of 500 tons of machinery cast the past week, but New England foundries as a rule continue to buy in a hand-to-mouth manner from local or nearby yards at around 80c. per 100 lb. with 30-day terms.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$19.00 to $20.00
No. 2 machinery cast	17.00 to 18.00
Stove plate	15.00 to 16.00
Railroad malleable	15.50 to 16.50

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$11.00 to $11.75
No. 1 railroad wrought	12.50 to 13.00
No. 1 yard wrought	10.00 to 11.00
Wrought pipe (1-in. in diam., over 2 ft. long)	8.50 to 9.00
Machine shop turnings	8.50 to 9.00
Cast iron borings, rolling mill	9.50 to 10.00
Cast iron borings, chemical	11.50 to 12.00
Blast furnace borings and turnings	8.75 to 9.50
Forged scrap and bundled skeleton	8.00 to 8.50
Street car axles	17.50 to 18.00
Shafting	16.00 to 16.50
Rerolling rails	11.00 to 12.00
Street car wheels	13.50 to 14.00

Cincinnati

No Southern Iron Being Shipped—Tuscaloosa Stack Blown in

CINCINNATI, Aug. 22.

Pig Iron.—The demand for pig iron for prompt shipment continues active, but the supply is exceedingly short. There is almost no Southern iron available on which shipments can be made, and as a result melters are turning to Northern furnaces located on roads which are not greatly affected by railroad strike. Most of the iron now being sold is coming from the Valleys, with Chicago being quoted where freight rates make it possible. All southern Ohio furnaces are out of the market, being completely sold up. Prices are very firm, Valley iron being quoted in this district at $30, base. The last sale of southern Ohio iron reported was on $28, Ironton, basis, for 500 tons for shipment to a southern Ohio melter. Iron from the Ironton district was sold into Pittsburgh district early last week at $30, furnace, one lot being for 300 tons. A nearby melter bought 1000 tons at $30, Valley, and another melter took 500 tons at the same figure. A Michigan melter bought 3000 tons at a reported price of $30, Chicago furnace. A sale of silvery iron for last quarter was made at $38.50, Jackson County furnace, for 8 per cent. Inquiries include one for 5000 tons for basic for a Kentucky steel plant, 800 tons of malleable for northern Ohio,

500 tons of silvery for Detroit and several lots of 200 tons for nearby melters. Tuscaloosa furnace in Alabama blew in to-day, and will have iron available for third and fourth quarter shipment. Some Southern furnaces are quoting as high as $27 for immediate delivery, but resale material is available at $20 to $21, and several furnaces are reported to be willing to book fourth quarter business at the former figures.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$24.05 to $25.05
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	24.55 to 25.55
Ohio silvery (nominal), 8 per cent	38.27
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	30.27 to 32.27
Basic Northern	28.27
Malleable	30.27 to 32.27

Finished Material.—While the demand for finished materials has abated somewhat, anything offered for prompt delivery is quickly snapped up. This is especially true of galvanized sheets, which are very scarce. Shapes also are in good demand for immediate delivery. Opening of the books of the American Sheet & Tin Plate Co. for fourth quarter at 2.50c. for blue annealed, 3.35c. for black, and 4.35c. for galvanized sheets has been followed by announcements from several independent makers that prices for fourth quarter will be 2.60c., 3.50c. and 4.50c., respectively. A fair tonnage of sheets has been booked for this delivery at the new prices. An inquiry for 500 tons of reinforcing bars for delivery during the first quarter of next year has been received, but no action taken. Prices have been advanced from $6 to $10 a ton on pipe, the discount on black pipe having been reduced 3 points and on galvanized two points. Wrought iron pipe has been advanced $10 per ton. On bars, shapes and plates practically all of the orders placed carry a price of 2c., and on the less desirable business as high as 2.25c. is being quoted. Some railroad equipment business has appeared. The Louisville & Nashville Railroad has sent out an inquiry for 250 tons of locomotive tires, and the Kentucky & Indiana Railway is in the market for 250 tons of heavy rails. Two inquiries for 300 tons each of shapes are current.

Warehouse Business.—Local jobbers have announced advances of $2 to $5 per ton on all products, with the exception of black and galvanized sheets and wire nails. The demand continues strong.

Cincinnati jobbers quote: Iron and steel bars, 2.85c. base; reinforcing bars, 2.95c. base; hoops, 3.85c. base; bands, 3.60c. base; shapes and plates, 2.95c. base; cold-rolled rounds, 3.65c. base; cold-rolled flats, squares and hexagons, 4.15c. base; No. 10 blue annealed sheets, 3.75c.; No. 28 black sheets, 4.50c.; No. 28 galvanized sheets, 5.50c.; No. 9 annealed wire, $2.70 per 100 lb.; common wire nails, $2.85 per keg, base.

High-Speed Steel.—A reduction of 5c. per lb. has been made in prices of high-speed steel, which is now quoted at 70c. per lb. for 18 per cent tungsten. The demand is light.

Coke.—Easing up in the Connellsville field is seen in offers of coke at $14.50 for shipment this week. The demand is fairly active, and shipments, with the exception of Wise County, are coming forward in fair time. Prices are unchanged with the exception of Connellsville from last week.

Old Material.—Local dealers report the demand for scrap light but nevertheless the market is showing strength, as dealers are holding tight for higher prices when the railroad situation clears up. Shipments are very slow, with steel plants in no hurry for material. Prices are not quotably changed.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

Per Gross Ton	
Bundled sheets	$8.00 to $8.50
Iron rails	13.50 to 14.00
Relaying rails, 50 lb. and up	26.50 to 27.00
Rails for rerolling	13.50 to 14.00
Heavy melting steel	13.00 to 13.50
Steel rails for melting	13.00 to 13.50
Car wheels	14.50 to 15.00
Per Net Ton	
No. 1 railroad wrought	11.50 to 12.00
Cast borings	9.00 to 9.50
Steel turnings	8.00 to 8.50
Railroad cast	14.00 to 14.50
No. 1 machinery	17.00 to 17.50
Burnt scrap	9.50 to 10.00
Iron axles	18.00 to 18.50
Locomotive tires (smooth inside)	11.00 to 11 50
Pipes and flues	6.50 to 7.00

St. Louis

ST. LOUIS, Aug. 22.

Pig Iron.—Continued strength features the market for pig iron. Prices have advanced further, the upturn being due in large measure to the fact that certain industries are in urgent need of material and are seeking tonnages from nearby to take the place of those which have been delayed by the transportation disabilities. At Chicago $30 is being asked for No. 2 Northern, silicon 1.75 to 2.25 per cent, an increase of $2 on prompt and $3 on contract iron. The Southern market is also very strong. Sales as high as $22 Birmingham were reported, and one prominent furnace interest in that locality is asking $24. The leading local producer had not advanced his price, but was expected to lift it to correspond to the rise at Chicago. Sales reported include 1600 tons of foundry and 2500 tons of malleable to Ohio ports; 700 to 800 tons to Indiana melters; 1000 tons to a Michigan melter and 200 tons to scattering interests in this district. All the above tonnages were supplied by the St. Louis Coke & Chemical Co. A Southern furnace sold 450 tons to local stove and job plants, and other sales ranging from car lots to 150 tons will total about 350 tons. There is an inquiry from an Indiana melter for 300 tons of foundry iron, and a central Illinois interest is inquiring for 3000 tons. Miscellaneous inquiries from melters in the district proper total from 1500 to 2000 tons. All users of iron are anxious to get in their quotas, and there are numerous complaints of delayed shipments, especially from the South, in which general region embargoes have been placed by several roads against this gateway.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago and $5.17 from Birmingham and 81 cents average switching charge from Granite City:

Northern foundry, sil. 1.75 to 2.25 (forward delivery)	$32.16
Northern malleable, sil. 1.75 to 2.25 (forward delivery)	32.16
Basic (third quarter)	32.16
Southern foundry, all rail, sil. 1.75 to 2.25	$26.17 to 28.17

Finished Iron and Steel.—The feature of the trade at the moment is the large volume of demands for material for immediate delivery. Consumers with contracts, especially with manufacturers located at a distance, are experiencing difficulties in securing deliveries, and are endeavoring to eke out with material purchased nearer home. The result has been a heavy draft on warehouse stocks, which are reported generally at a low ebb. Local mills are burdened with orders, and are behind on deliveries, some as long as four weeks. The demand for steel bars is in excess of the supply, and plates are urgently sought. A local boiler manufacturer is inquiring for 2000 tons of plates. Wire and wire products are active. Novelty and hardware industries are furnishing a broad outlet for steel bars of forging quality. Warehouse prices hold firm, but no specific changes were reported.

For stock out of warehouse we quote: Soft steel bars, 2.70c. per lb.; iron bars, 2.70c.; structural shapes, 2.80c.; tank plates, 2.80c.; No. 10 blue annealed sheets, 3.85c.; No. 28 black sheets, cold rolled, one pass, 4.45c.; cold drawn rounds, shafting and screw stock, 3.50c.; structural rivets, $3.35 per 100 lb.; boiler rivets, $3.45; tank rivets, 7/16 in. and smaller, 60 per cent off list; machine bolts, large, 50 and 10 per cent; small, 50-10 and 10 per cent; carriage bolts, large, 55-5 per cent; small, 60 and 10 per cent; lag screws, 60 per cent; hot pressed nuts, square or hexagon blank, $3.50; and tapped, $3.25 off list.

Coke.—Virtually no metallurgical coke is arriving from Eastern or Southern ovens, and melters in the district continue to rely on supplies from local by-product manufacturers. The few cars from Connellsville drifting in are bringing fancy prices, two cars having sold on a basis of $20 ovens, which is equal to about $24.40 delivered in St. Louis. Buying is from hand to mouth, as no consumer wants to take more than absolutely necessary at present levels. During the past several days there has been a lull in the demand, attributable to improved prospects for strike settlement, but prices have not receded. The Granite City producer continues to quote $12, f.o.b. ovens for foundry coke. The Indiana Coke & Gas Co., Terre Haute, which supplies large tonnages to this center, is quoting $15 to

$16. Latest Chicago prices are $11.55 for domestic and $13.50 for foundry grades.

Old Material.—The market for scrap iron and steel scored further price advances during the past several days, under an urgent demand from both mills and foundries for all grades and descriptions. With the exception of the two plants closed down through lack of coal, all users in the district are operating, and are eagerly seeking all the scrap they can get. The railroads are offering nothing, and will not attempt to ship their scrap until the strike of shop men has been disposed of. Heavy melting steel and steel specialties are especially active, and there seems to be a limitless demand for cast scrap. Yard stocks are feeling the effects of recent heavy shipments, and are at the lowest ebb in many months. Rails for rerolling have advanced further, though the leading consumer is out of the market. All industries are taking in everything offered, and urging prompter deliveries upon dealers. Liberal premiums are being paid for quick shipment.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Old iron rails	$17.75 to $18.75
Rails for rerolling	17.00 to 17.50
Steel rails, less than 3 ft.	17.00 to 17.50
Relaying rails, standard section	24.00 to 29.50
Cast iron car wheels	20.00 to 20.50
No. 1 heavy railroad melting steel	16.00 to 16.50
No. 1 heavy shoveling steel	15.00 to 15.50
Ordinary shoveling steel	14.50 to 15.00
Frogs, switches and guards, cut apart	16.25 to 16.75
Per Net Ton	
Heavy axle and tire turnings	10.50 to 11.00
Steen angle bars	15.25 to 15.75
Iron car axles	24.00 to 24.50
Steel car axles	17.00 to 17.50
Wrought iron bars and transoms	19.00 to 19.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	13.00 to 13.50
Railroad springs	19.00 to 20.00
Steel couplers and knuckles	18.00 to 18.50
Cast iron borings	9.00 to 9.50
No. 1 busheling	12.00 to 12.50
No. 1 railroad cast	17.50 to 18.00
Stove plate and light cast	14.75 to 15.25
Railroad malleable	14.50 to 15.00
Pipes and flues	9.75 to 10.25
Machine shop turnings	9.25 to 9.75

Cleveland

No Improvement in Fuel Situation—Pig Iron Advances $2

CLEVELAND, Aug. 22.—No improvement has developed in the fuel situation since the partial settlement of the coal strike in the bituminous fields and better conditions are not expected for some time. One additional blast furnace in this district has been banked, this being a Central furnace of the American Steel & Wire Co., leaving only one of four furnaces in blast. Ohio mines are resuming operations, but little coal has commenced to move. Plans are being perfected for pooling coal shipments for the Northwest by the Ore and Coal Exchange in this city. Priority orders for fuel for the Northwest are expected to divert considerable of the Kentucky and West Virginia coal that has been going to Ohio coke and steel plants, shipments of which have been greatly reduced because of the lack of transportation facilities resulting from the shopmen's strike. Plants depending on Kentucky and West Virginia fuel report no improvement in receipts.

Iron Ore.—The ore shipping situation at Escanaba and Ashland has become worse, service on the Northwestern railroad which reaches both ports and on the Chicago, Milwaukee & St. Paul which serves Escanaba being badly crippled. The ore movement to these ports is only 60 to 70 per cent of shippers' schedules. In order to keep mines in operation, shipments from stock piles have been discontinued and available transportation facilities are being used only for moving the production of the mines. At Superior where the Great Northern Railroad experienced difficulty, normal conditions have been restored in the shipment of ore. So far the railroad situation has interfered very little with the ore movement from Lake Erie docks. With the resumption of operations by Ohio mines, except in the Hocking district, coal is beginning to move to lake docks for the Northwest under priority orders, but it is expected that it will be ten days before the movement becomes anywhere near normal.

Lake Superior ore on hand at furnaces and Lake Erie docks Aug. 1 amounted to 31,127,303 tons according to the monthly report of the Lake Superior Iron Ore Association. On the same date a year ago, the amount was 32,628,786 tons. The ore on hand at furnaces Aug. 1 was 23,830,461 tons. During July the amount of Lake Superior ore consumed was 3,582,715 tons as compared with 3,440,583 tons during June.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, $5.95; Old range non-Bessemer, 51½ per cent iron, $5.20; Mesabi Bessemer, 55 per cent iron, $5.70; Mesabi non-Bessemer, 51½ per cent iron, $5.05.

Pig Iron.—The Cleveland price on foundry iron has been advanced $2 and a local producer has sold a 1000-ton lot and small lots aggregating several hundred tons at that price for early shipment. Two or three lake furnaces are still taking orders for small lots of prompt shipment foundry iron from regular customers who are in urgent need of material, but are turning down all other inquiries. There are no reports of foundries being compelled to shut down because of lack of pig iron but some will probably have to do so shortly. Malleable iron is even scarcer than foundry grades. Price is of not much consideration to consumers who must have iron. Sales are reported at $30 to $31 for foundry grades. Small lots of southern Ohio iron have sold in this territory at the same price and some is still available at $30.50 to $31. A Lorain consumer paid $33 for a car lot of Buffalo iron, but the Buffalo market now seems established at $34 for August and September shipment, a sale in Buffalo of 500 tons of No. 2-X being made at $35. For the fourth quarter Buffalo furnaces are still quoting the $30 price. With almost famine conditions prevailing considerable inquiry is coming out, some for round lots. The Westinghouse Electric & Mfg. Co. has purchased about 1000 tons of various grades of foundry iron for its Cleveland plant and has inquired for 800 tons for Trafford, Pa., and 100 tons for Springfield, Mass. The General Electric Co. is inquiring for 1000 tons for its Erie, Pa., plant for prompt shipment and the U. S. Malleable Co., Toledo, has an inquiry out for 1500 tons of malleable iron for September shipment. The Andrews Steel Co. has an inquiry out for 5000 tons of basic for August and September shipment. An Indiana melter is inquiring for 250 tons of foundry iron. A resale lot of 200 tons of foundry iron brought about $30. Southern producers are making little effort to sell iron in this territory because they are able to ship only a very limited amount on what they have sold. On Southern iron $23 Birmingham is regarded as a nominal price, but one Tennessee producer is asking $27 for September and $28 for October shipment. Low phosphorus iron has advanced $1 per ton. A Valley interest reports several sales aggregating about 1000 tons at $35 to $36, but has withdrawn the $35 price and on an inquiry this week for 300 tons quoted $37. The same interest sold 300 tons of off low phosphorus iron to a Bessemer consumer in the Pittsburgh district at $32.50 to $33, indicating an acute shortage of Bessemer iron. Practically no Ohio silvery iron is available and on this grade $36 is a nominal quotation for 8 per cent silicon iron. One quotation of $39.80 was made for 9 to 10 per cent silicon. The sale of two car lots of 10 per cent Bessemer ferrosilicon at the regular schedule of $41.50 has been made to a consumer who will use this iron in the place of silvery.

Quotations below are f.o.b. local furnace for Northern foundry iron, not including a 50c. switching charge. Other quotations except basic and low phosphorus are delivered Cleveland, being based on a $3.02 rate from Jackson and a $6 rate from Birmingham:

Basic, Valley furnace	$27.00
Northern No. 2 fdy., sil. 1.75 to 2.25	31.00 to 32.00
Southern fdy., sil. 1.75 to 2.25	26.50
Malleable	31.00 to 32.00
Ohio silvery, nom., sil. 8 per cent	39.02
Standard low phos., Valley furnace	$36.00 to 37.00

Semi-Finished Steel.—Some orders for sheet bars, slabs and billets are being booked for the fourth quarter by a local mill subject to prices to be agreed on later, the producer being unwilling to name prices at the present time.

Finished Iron and Steel.—Inquiries and orders have fallen off and consumers are devoting their attention to

pushing the mills for deliveries. Several independent mills are keeping out of the market until they get caught up on their orders. There is considerable demand for steel bars, inquiries including several lots aggregating 4000 tons, mostly for car repair work. A northern Ohio consumer is inquiring for 1500 tons of automobile rim steel. The demand from agricultural implement manufacturers, which has been light, shows an increase. On steel bars, plates and structural material 1.80c. is still the minimum price for indefinite delivery. On plates 2.25c. has become a common quotation by mills able to make fair deliveries, and considerable business is being booked at that price. An Eastern plate mill has advanced its price to 2.50c. In structural lines the American Bridge Co. has taken the buildings for the new steel plant of the Otis Steel Co. requiring 9500 tons and considerable new work is being bid on. The settlement of the coal strike in Ohio has resulted in an active demand for small lots of light rails from mining companies and these are quoted at 1.90c. to 2c. A manufacturer is inquiring for 300 tons of light rails.

Jobbers quote steel bars, 2.66c.; plates and structural shapes, 2.76c.; No. 9 galvanized wire, 3c.; No. 9 annealed wire, 2.50c.; No. 28 black sheets, 4.25c.; No. 28 galvanized sheets, 5.25c.; No. 10 blue annealed sheets, 3.50c. to 3.61c.; hoops and bands, 3.31c.; cold-rolled rounds, 3.45c.; flats, squares and hexagons, 3.95c.

Sheets.—The demand for sheets is heavy, but some mills can still make fairly good deliveries. Some independent mills, while not taking fourth quarter contracts, are booking orders at 3.50c. for black and 4.50c. for galvanized or $3 a ton above the American Sheet & Tin Plate Co. price, on which delivery will be made during that quarter. Independent mills quote blue annealed sheets at 2.55c. to 2.65c. and automobile body sheets at 4.75c.

Reinforcing Bars.—The market on hard steel reinforcing bars is firm at 1.90c. and a fair tonnage of new work is coming out. The Concrete Steel Co. has taken 300 tons for the filtration plant in Toledo.

Warehouse Business.—Local warehouses have advanced prices on black and galvanized sheets $5 a ton. These were not changed at the time of the recent advance on blue annealed sheets.

Bolts, Nuts and Rivets.—There is talk of another price advance on bolts and nuts owing to the constantly increasing costs. Makers report a good volume of specifications on contracts and considerable new business.

Coke.—Car lot sales of Connellsville foundry coke are reported at $15 with the supply very limited. Furnace coke is offered at $14.50.

Old Material.—Local scrap prices have advanced about $1 per ton on heavy melting steel and a number of other grades as a result of the release of about 45,000 tons of heavy melting steel and compressed steel scrap by the McKinney Steel Co., that was purchased two years ago at the high prices then prevailing. This company has made adjustments with dealers on the basis of a $5 a ton reduction from the contract price on heavy melting steel and $3 per ton on compressed steel. The acceptance of this scrap has created only a limited amount of activity, as most dealers purchased material against their contracts at the time they sold the scrap. There is virtually no demand from mills. Valley district mills are taking shipments rather slowly, some being held up. Local dealers report that they can sell heavy melting steel at $18 Youngstown, subject to acceptance of deliveries by consumers.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel	$16.00 to $16.50
Steel rails, under 3 ft	16.00 to 16.50
Rails for rolling	16.75 to 17.25
Iron rails	14.00 to 15.00
Iron car axles	18.00 to 19.00
Low phosphorus melting	17.00 to 17.25
Cast borings	12.50 to 12.75
Machine shop turnings	12.00 to 12.25
Mixed borings and short turnings	12.00 to 12.25
Compressed steel	14.50 to 14.75
Railroad wrought	14.00 to 14.50
Railroad malleable	16.50 to 16.75
Light bundled sheet stampings	11.00 to 11.25
Steel axle turnings	13.50 to 14.00
No. 1 cast	17.00 to 17.50
No. 1 busheling	11.25 to 11.50
Drop forge flashings over 10 in.	10.50 to 10.75
Drop forge flashings under 10 in.	10.50 to 10.75
Railroad grate bars	13.75 to 14.25
Stove plate	13.75 to 14.25
Pipes and flues	10.00 to 11.00

Philadelphia

Demand for Pig Iron Increases—Eastern Steel Plants to Advance Wage Rates

PHILADELPHIA, Aug. 22.—The announcement of a 20 per cent advance in wages by the United States Steel Corporation, effective Sept. 1, was not unexpected, and Eastern steel companies were prepared to-day to announce that they would put into effect a similar advance, which will make the wage rate in this district 30c. an hour. There will be a further added cost in steel making if the coal mining rates adopted at the recent Cleveland conference become general. It is stated by steel companies in this district, including those which operate their own non-union mines, that this rate will mean an additional cost of $1.50 to $2 per ton of steel.

On the whole, the Eastern steel companies are operating at a better rate than those in the Pittsburgh and Youngstown districts, and there has been no further curtailment of pig iron production within the past week. The blast furnaces now operating have coke enough in sight for at least a month.

Despite the fact that a bituminous coal production of 6,000,000 tons is indicated for this week, the Pennsylvania mines are not gaining. A report of the Pennsylvania Coal Commission at Harrisburg showed that about 100,000 tons less was shipped last week than in the week preceding. Production was at its highest in the Westmoreland district, where it was reported as having reached 88 per cent of normal. In the Pittsburgh district, production amounts almost to nothing, and in other sections outside of the Westmoreland district it is from 12 to 50 per cent of normal.

Ferroalloys.—A sale of a carload of ferromanganese for prompt shipment at $72.50, seaboard, is the only transaction reported within the week. British ferromanganese for forward delivery is still available at $67.50, seaboard.

Semi-finished Steel.—Prices on billets remain nominally at $37.50 for open hearth rerolling quality and $42.50 for forging quality, but there is very little demand. No sales are reported.

Pig Iron.—The scarcity of domestic pig iron is indicated by inquiries which have come to this city from the Pittsburgh, Cincinnati and Buffalo districts for foreign iron. A West Virginia steel company has tried to buy 5000 tons of basic iron in the East. It is reported here that a Pittsburgh steel company has bought 13,000 tons of foreign basic. There is very little domestic basic available. An Eastern Pennsylvania steel company bought several thousand tons of off-grade iron from another steel company for immediate shipment. An Eastern subsidiary of the Steel Corporation decided not to buy merchant iron and will continue to depend on the Corporation furnaces. The cheapest basic available is 2000 tons, which was offered at $27, furnace, but others will not sell below $30, furnace. Domestic foundry iron is to be had from only two Eastern furnaces, both of which are quoting $31 for No. 2 plain and $32 for No. 2 X, f.o.b. furnace. One will advance these quotations $1 a ton within a day or two. Higher silicon iron has sold at $34 for 3.80 per cent silicon and at $35 for 4 per cent silicon, f.o.b. furnace. Foreign iron is in good demand and sales are being made at prices which range from $28 to $33, Philadelphia, the price varying according to the source and silicon content, No. 3 Scotch, which is practically equivalent to domestic No. 2 X, bringing the highest prices. The American Radiator Co. is in the market for 5000 tons of foundry and will probably take a large share in foreign iron. The General Electric Co. has inquired for 4000 tons and the Westinghouse Electric & Mfg. Co. for 2000 tons of foundry, all for delivery within the next two months. There are numerous other small inquiries, and it is apparent that all of the current demand cannot be satisfied from the small quantity of iron now being produced. According to the estimates of those engaged in importing foreign iron, the total that has been received at various Atlantic ports since the movement began is 75,000 tons or more.

Of this a cast iron pipe manufacturer has brought in about 20,000 tons; a pig iron sales company has brought in an additional 20,000 tons, and a New York importer adds to this about 30,000 tons, all of the latter having been sold to brokers. Scattering lots brought in by other pig iron dealers would probably total 5000 to 10,000 tons.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia, and include freight rates varying from 76 cents to $1.64 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$32.14 to $32.64
East. Pa. No. 2X, 2.25 to 2.75	33.14 to 33.64
East. Pa. No. 1X	34.64
Virginia No. 2 plain, 1.75 to 2.25 sil.	29.17 to 30.17
Virginia No. 2X, 2.25 to 2.75 sil.	30.17 to 31.17
Basic delivery eastern Pa.	28.64 to 31.14
Gray forge	29.50 to 31.50
Malleable	30.00 to 32.00
Standard low phos. (f.o.b. furnace)	35.00
Copper bearing low phos. (f.o.b. furnace)	35.00 to 40.00

Plates.—Three or four Eastern mills are selling plates in limited tonnages, and sales are restricted mostly to regular customers. One or two mills have not raised their price above 2c., Pittsburgh, but the others are quoting 2.25c. and have made sales on this basis. A Youngstown mill is now offering plates in this district and has sold nearly 1000 tons at 2.25c., Youngstown. The Lukens Steel Co. has now equipped nearly half of its open-hearth furnaces with fuel oil burners. The Baldwin Locomotive Works have received orders for 30 locomotives for the Erie Railroad and 15 for the Union Pacific.

Structural Material.—Prices quoted for plain material range from 2c. to 2.25c., Pittsburgh, with the possibility that attractive jobs might be protected at slightly under 2c. Structural work has fallen off somewhat. Two West Philadelphia apartment houses, requiring 1500 to 2000 tons, are being figured, and a State building at Richmond, Va., requiring a few hundred tons, is also in the market.

Bars.—Soft steel bars are hard to get. The few mills that are selling are asking not less than 2c., Pittsburgh, and some quotations are higher, up to 2.25c. having been paid. With steel bars scarce, bar iron is in better demand and Eastern mills have no difficulty in getting 2c., Pittsburgh, for carloads and 2.10c. for less than carload lots.

Sheets.—Independent mills are quoting from $2 to $3 a ton higher on sheets than the new prices named by the American Sheet & Tin Plate Co. On blue annealed the usual quotation of independents is 2.60c.; on black, 3.50c., and on galvanized, 4.50c., all base Pittsburgh. Deliveries in from two to eight weeks are being promised.

Warehouse Business.—A steady demand for steel out of stock continues and some warehouse stocks are running low with replenishment difficult. Prices of sheets and cold-rolled steel have been advanced. We quote for local delivery out of stock as follows:

Soft steel bars and small shapes, 2.80c.; iron bars (except bands), 2.80c.; round edge iron, 3c.; round edge steel, iron finish, 1½ x ½ in., 3c.; round edge steel planished, 3.75c.; tank steel plates, ¼-in. and heavier, 2.90c.; tank steel plates, 3/16-in., 3.10c.; blue annealed steel sheets, No. 10 gage, 3.60c.; black sheets, No. 28 gage, 4.45c.; galvanized sheets, No. 28 gage, 5.60c.; square twisted and deformed steel bars, 2.90c.; structural shapes, 2.90c.; diamond pattern plates, ¼-in., 4.80c.; 3/16-in., 5c.; spring steel, 3.50c.; round cold-rolled steel, 3.50c.; squares and hexagons, cold-rolled steel, 4c.; steel hoops, No. 13 gage and lighter, 4c.; steel bands, No. 12 gage to 3/16-in., inclusive, 3.45c.; rails, 2.80c.; tool steel, 8c.; Norway iron, 5.50c.

Old Material.—The tone of the scrap market is considerably stronger. The Bethlehem Steel Co. has bought a large tonnage of No. 1 steel scrap at $15.50 and $16, delivered, and the same prices are obtained from one or two other mills. The only weak item on the list is blast furnace borings and turnings, this being due to the banking and blowing out of many furnaces due to coke shortage. Cast iron car wheels, No. 1 railroad wrought and machine shop turnings for rolling mill use are particularly strong. We quote for delivery at consumers' works in this district as follows:

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$15.50 to $16.00
Scrap rails	15.50 to 16.00
Steel rails, rerolling	17.00 to 17.50
No. 1 low phos., heavy 0.04 and under	22.00 to 24.00
Cast iron car wheels	19.00 to 19.50
No. 1 railroad wrought	18.50 to 19.00
No. 1 yard wrought	17.00 to 17.50
No. 1 forge fire	14.00 to 14.50
Bundled sheets (for steel works)	13.50 to 14.00
No. 1 busheling	12.50 to 13.00
No. 2 busheling	10.00 to 11.00
Turnings (short shoveling grade for blast furnace use)	13.00 to 13.50
Mixed borings and turnings (for blast furnace use)	13.00 to 13.50
Machine-shop turnings (for steel works use)	13.50 to 14.00
Machine-shop turnings (for rolling mill use)	14.50 to 15.00
Heavy axle turnings (or equivalent)	14.50 to 15.00
Cast borings (for steel works and rolling mills)	14.50 to 15.00
Cast borings (for chemical plants)	17.00 to 17.50
No. 1 cast	19.00 to 20.00
Heavy breakable cast (for steel plants)	19.00 to 19.50
Railroad grate bars	15.50 to 16.00
Stove plate (for steel plant use)	15.00 to 16.00
Railroad malleable	15.00 to 15.50
Wrought iron and soft steel pipes and tubes (new specifications)	14.00 to 14.50
Shafting	21.00 to 22.00

Railroad Car and Locomotive Buying

Activity in car repairing continues to be the conspicuous feature of the railroad equipment market, but the buying of new locomotives is also notable. The following are the items of chief interest:

The St. Louis & San Francisco has let 500 hopper bodies to the American Car & Foundry Co.

The Monon has awarded 300 gondola cars to the Pullman Co.

The Chicago & Northwestern has placed 1000 box car repairs with Western Steel Car & Foundry Co.

The Cincinnati, Indianapolis & Western is inquiring for 200 to 300 composite gondola cars.

The Union Pacific has ordered 55 mountain type and 10 Mallet type locomotives from American Locomotive Co. and 15 locomotives from the Baldwin Locomotive Works.

The Erie has placed 30 Mikado type engines with Baldwin Locomotive Works.

Central Railroad of New Jersey has awarded car repairs on 200 cars to the Koppel Car Repair Co., and a round lot to the Standard Steel Car Co.

Chicago, Rock Island & Pacific has ordered repairs to 1500 National dump cars from the Western Steel Car & Foundry Co.

Lehigh Valley is believed to have ordered repairs on 500 steel cars.

The Central of Georgia is inquiring for 100 new freight cars.

Two inquiries have appeared from India, one for 270 cars for the South Indian Railway Co., and 516 cars for the Burmah Railways.

Some 8000 freight cars, which had been bought by the United States for use in France in the war and which have been in storage largely near Norfolk, have been sold to the Polish-Silesian Railway Administration. The cars are taken as they are, at a bid somewhat higher than various American concerns were bidding, but the latter bids were based on a demolition of the cars and the disposition of the material as scrap.

According to a report from the British Empire Steel Corporation, Montreal, Que., a second blast furnace may shortly be blown in at the plant of the Dominion Steel Corporation at Sydney, N. S., if general labor and business conditions permit. The second furnace will turn out foundry pig iron. It is further reported that a battery of 90 coke ovens will also be put into operation.

At the request of President John A. Logan, Youngstown, the sale of the property at Mineral Ridge, Trumbull County, Ohio, of the Ohio Steel Products Co., was postponed last Saturday. The plant was to have been sold at sheriff's sale, because of financial difficulties. It was organized to manufacture conduit, but the plant never really got into production in any substantial way.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Plates

Sheared, tank quality, base, per lb.....1.80c. to 2.25c.

Structural Material

Beams, channels, etc.....1.80c. to 2.25c.

Iron and Steel Bars

Soft steel bars, base, per lb.....1.80c. to 2.25c.
Refined iron bars, base, per lb.....2.35c.

Hot-Rolled Flats

Hoops, base, per lb. .....2.50c. to 2.75c.
Bands, base, per lb. .....2.50c. to 2.75c.
Strips, base, per lb.....2.50c. to 2.75c.
Cotton ties, per bundle of 45 lb.....$1.11

Cold-Finished Steels

Bars and shafting, base, per lb.....2.25c.
Strips, base, per lb. .....4.00c.

Wire Products

Nails, base, per keg.....$2.40 to $2.60
Bright plain wire, base, per 100 lb..... 2.25 to 2.35
Annealed fence wire, base, per 100 lb..... 2.25 to 2.35
Galvanized wire, base, per 100 lb..... 2.75 to 2.85
Galvanized barbed, base, per 100 lb. ..... 3.05 to 3.15
Galvanized staples, base, per keg ..... 3.05 to 3.15
Painted barbed wire, base, per 100 lb. ..... 2.55 to 2.65
Polished staples, base, per keg ..... 2.55 to 2.65
Cement coated nails, base, per count keg.....1.90c. to 2.10c.
Woven fence, carloads (to jobbers).....73 per cent off list
Woven fence, carloads (to retailers)....70½ per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads,
60, 10 and 10 per cent off list
Machine bolts, small, cut threads....60 and 10 per cent off list
Machine bolts, larger and longer.....60 and 10 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads.60 and 10 per cent off list
Cut threads .....60 per cent off list
Longer and larger sizes .....60 per cent off list
Lag bolts .....60, 10 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.:
Smaller and shorter.....50 and 10 per cent off list
Larger and longer sizes .....50 and 10 per cent off list
Hot pressed square or hex. blank nuts .....$4.50 off list
Hot pressed nuts, tapped .....$4.50 off list
C.p.c. and t. sq. or hex. nuts, blank .....$4.50 off list
C.p.c. and t. sq. or hex. nuts, tapped .....$4.50 off list
Semi-finished hex. nuts:
9/16 in. and smaller, U. S. S.....80 and 10 per cent off list
⅝ in. and larger, U. S. S...75 and 10 and 10 per cent off list
Small sizes, S. A. E. .....80, 10 and 10 per cent off list
S. A. E. ⅝ in. and larger..75 and 10 and 10 per cent off list
Stove bolts in packages .....80 and 5 per cent off list
Stove bolts in bulk .....80, 5 and 2½ per cent off list
Tire bolts .....65 per cent off list

Cap and Set Screws

Milled square and hex. head cap screws,
75 and 10 per cent off list
Milled set screws.....75 per cent off list
Upset cap screws .....80 per cent off list
Upset set screws .....80 and 5 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb.....$2.65
Large boiler rivets, base, per 100 lb..... 2.75
Small rivets .....70 to 70 and 5 per cent off list

Track Equipment

Spikes, ⅝ in. and larger, base, per 100 lb.....$2.35 to $2.50
Spikes, ½ in. and smaller, base, per 100 lb..... 2.75 to 3.00
Spikes, boat and barge, base, per 100 lb..... 2.75 to 3.00
Track bolts, base, per 100 lb..... 3.25 to 3.50
Tie plates, per 100 lb. ..... 2.00 to 2.25
Angle bars, base, per 100 lb. 2.40

Welded Pipe

Butt Weld

Steel Inches	Black	Galv.	*Iron* Inches	Black	Galv.
⅛ 51½-54½	26	-28	¼ to ⅜.....+ 1½		+27½
¼ to ⅜.57	-60	31½-33½	½	31½	13½
½ 62	-65	48½-50½	¾	37½	22½
¾ 66	-69	54½-56½	1 to 1½.....	39½	24½
1 to 3...68	-71	56½-58½			

Lap Weld

2 61	-63	49½-51½	2	34½	20½
2½ to 6.65	-68	53½-55½	2½ to 6.....	37½	24½
7 to 8...62	-65	49½-51½	7 to 12.....	35½	22½
9 to 12..61	-64	48½-50½			

Butt Weld, extra strong, plain ends

⅛ 47½-50½	31	-33	¼ to ⅜.....+ 9½		+42½
¼ to ⅜.53	-56	36½-38½	½	30½	18½
½ 59	-62	48½-50½	¾	37½	23½
¾ 64	-67	53½-55½	1 to 1½.....	39½	25½
1 to 1½..66	-69	55½-57½			
2 to 3...67	-70	56½-58½			

Lap Weld, extra strong, plain ends

2 59	-62	48¼-50½	2	35½	22½
2½ to 4.63	-66	52½-54½	2½ to 4.....	38½	26½
4½ to 6.62	-65	51½-53½	4½ to 6.....	37½	25½
7 to 8...58	-61	45½-47½	7 to 8.....	30½	18½
9 to 12..52	-55	39½-41½	9 to 12.....	25½	13½

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 and 2½ per cent.

Boiler Tubes

Lap Welded Steel		*Charcoal Iron*	
1¾ in.	26½	1½ in.	5
2 to 2¼ in.....	41	1¾ to 1⅞ in.....	15
2½ to 3 in.....	52	2 to 2¼ in.....	25
3¼ to 13 in.....	57	2½ to 3 in.....	30
		3¼ to 4½ in.....	32

To large buyers of steel tubes a supplementary discount of 5 per cent is allowed.

Standard Commercial Seamless Boiler Tubes

Discounts on cold-drawn or hot-rolled tubes in carload lots, f.o.b. Pittsburgh, follow:

1 in.	57 to 60	2½ and 2¾ in.....	36 to 43
1¼ in.	48 to 52	3 in.	40 to 47
1½ in.	47 to 52	3¼ to 4 in.....	45 to 52
1¾ in.	30 to 36	4¼ in. to 5 in.....	37 to 44
2 and 2¼ in.....	32 to 39		

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30, base, 85 per cent off list. Carbon 0.30 to 0.40, base, 83 per cent off list. Plus usual differentials and extras for cutting.

Seamless Locomotive and Superheater Tubes

Cents per Ft.		Cents per Ft.	
2-in. O.D. 11 gage.....15		2¼-in. O.D. 10 gage....18¾	
2-in. O.D. 12 gage.....14		3-in. O.D. 7 gage.....35½	
2-in. O.D. 10 gage.....16½		1½-in. O.D. 9 gage.....13	
2¼-in. O.D. 12 gage....16		5⅝-in. O.D. 9 gage.....53	
2¼-in. O.D. 11 gage....16½		5½-in. O.D. 9 gage.....55	

Tin Plate

Standard cokes, per base box.....$4.75

Terne Plate

(Per package, 200-lb.)

8-lb. coating	$9.30	25-lb. coating I. C.....$14.25	
8-lb. coating I. C.....	9.60	30-lb. coating I. C.....	15.25
15-lb. coating I. C.....	11.80	35-lb. coating I. C.....	16.25
20-lb. coating I. C.....	13.00	40-lb. coating I. C.....	17.25

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....2.50c. to 2.60c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.35c. to 3.50c.

Galvanized

No. 28 (base), per lb.....4.35c. to 4.50c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.35c. to 3.50c.

Manufacturers have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic.	$0.325	Buffalo	$0.265	St. Louis	$0.43
Philadelphia, export...	0.265	Cleveland	0.215	Kansas City	0.735
Baltimore, domestic...	0.315	Cleveland, Youngstown		Kansas City (pipe)...	0.705
Baltimore, export.....	0.255	Comb.	0.19	St. Paul	0.595
New York, domestic...	0.34	Detroit	0.295	Omaha	0.735
New York, export.....	0.285	Cincinnati	0.295	Omaha (pipe)	0.705
Boston, domestic	0.365	Indianapolis	0.31	Denver	1.275
Boston, export	0.285	Chicago	0.34	Denver (pipe)	1.215

Pacific Coast	$1.50
Pac. Coast, ship plates	1.20
Birmingham	0.69
Memphis	0.385
Jacksonville, all rail..	0.50
Jacksonville, rail and water	0.415
New Orleans	0.515

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha, and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 30c. to 40c.; ship plates, 30c. to 40c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 30c. to 40c.; sheets and tin plates, 50c.; rods, wire rope, cable and strands, 75c.; wire fencing, netting and stretcher, 50c.; pipe, not over 8 in. in diameter, 50c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

FABRICATED STEEL BUSINESS

Bridge and Building Awards and Tonnages Pending at Leading Centers

Awards for fabricated steel work for the past week include the following:

Publishing building for Street & Smith, West Fifteenth Street, New York, 800 tons, to Harris Structural Steel Co.

Public school No. 130, 300 tons, to A. E. Norton, Inc.

Hospital at Jamaica, Long Island, 300 tons, to George A. Just Co.

The United Gas Improvement Co., power house, Devon, Conn., 2000 tons, to McClintic-Marshall Co.

Phoenix Utilities Co., for Utah Power & Light Co., 800 tons of steel saddles, Grace, Idaho, to Virginia Bridge & Iron Works.

Federal Sugar Refining Co., Yonkers, N. Y., 160 tons, to Pittsburgh Bridge & Iron Works.

Fifteenth Regiment Armory, 142nd Street, New York, 1200 tons, to Post & McCord, Bethlehem Steel Bridge Corporation to fabricate.

New York Baseball Club, Polo Grounds, 2000 tons, to Post & McCord, Levering & Garrigues Co. to fabricate.

Public school No. 57, New York, 300 tons; No. 161, Brooklyn, N. Y., 800 tons, and No. 139, New York, 800 tons, all to Easton Structural Steel Co., Easton, Pa.

State Hospital, Brooklyn, N. Y., 200 tons, to Easton Structural Steel Co.

Communipaw Co., coal conveyor, 200 tons, to Easton Structural Steel Co.

Gas holder at Evansville, Ind., 350 tons, to Stacey Mfg. Co.

First National Bank, Long Beach, Cal., 481 tons, to American Bridge Co.

First National Bank, Whittier, Cal., 250 tons, to Baker Iron Works.

Three 120-ft. spans for bridge, Quimby, Iowa, 143 tons, to unnamed fabricator.

California Institute of Technology, high voltage building, Pasadena, Cal., 189 tons, to Llewellyn Iron Works.

Curry County, Oregon, bridge over Sixes River, 150 tons, to American Bridge Co.

Crown Willamette Paper Co., roof trusses, Camas, Wash., 128 tons, to Western Structural Steel & Tank Co.

Bankers Reserve Life Building, Omaha, Neb., 750 tons, to Mississippi Valley Structural Steel Co.

Heil Packing Co. Building, St. Louis, 200 tons, to Spuck Iron & Foundry Co.

Houghton, Mich., high school, 500 tons, to Worden-Allen Co.

Seaman body plant, Milwaukee, 500 tons, to Worden-Allen Co.

The Otis Steel Co., Cleveland, new plant, 9500 tons to the American Bridge Co.

Western Reserve University Buildings, Cleveland, 800 tons, to the American Bridge Co.

Addition to Summit County Court House, Akron, 250 tons, to the Burger Iron Co.

Outbound freight house for Pennsylvania and Detroit Railroad, 2000 tons, to American Bridge Co.

Structural Projects Pending

Inquiries for fabricated steel work which may be added to lists of pending projects include the following:

Hotel in New York, 1000 tons.

Office building for Burroughs-Wellcome Co., East Forty-first Street, New York, 1000 tons.

Public school building, New York, 3000 tons. New York City has let contracts for 26 new public schools, with 34 more, requiring perhaps 15,000 to 20,000 tons of steel, to be built within the next year.

Solvay Gas, Electric Light & Power Co., office building, Baltimore, 900 tons.

Bridge over Pennsylvania Railroad, Fortieth Street, for Philadelphia, 1000 tons.

Warehouse for James Butler, Astoria, Long Island, N. Y., 2000 tons.

New York Telephone Co., Third Avenue and 77th Street, Brooklyn, 700 tons.

Norfolk & Western Railroad, bridge at Clinchfield, Va., 250 tons.

Office building for Virginia at Richmond, 750 tons.

National Box & Lumber Co., Newark, N. J., 300 tons.

National Bank, Baltimore, 400 tons.

Highway bridge, Norfolk County, Virginia, 400 tons.

Bridge for the New York, New Haven & Hartford, Capital Avenue, New Haven, 400 tons.

Public Service Co. of Northern Illinois, power house, Waukegan, Ill., 2000 tons.

Atchison, Topeka & Santa Fe Railroad, shop, San Bernardino, Cal., 250 tons.

Crossett Lumber Co., power house, Crossett, Ark., 160 tons.

Addition to plant of Gardner-Harvey Paper Co., Middletown, Ohio, 300 tons, bids in.

Braun office building, Columbus, Ohio, 200 tons, bids in.

High school, Owensboro, Ky., tonnage unstated, bids being taken.

New York Telephone Co., Buffalo, 400 tons, bids taken.

Parcel Post Building, Cleveland, 500 tons.

Highway Bridge, Cook County, Illinois, 600 tons.

Union Pacific Railroad bridge over the Columbia River, 2500 tons.

STEEL CORPORATION WAGES

Advance of 20 Per Cent Is Announced Effective September 1

The United States Steel Corporation Tuesday announced an advance of 20 per cent in wages. In past years, a statement as to advances or declines has frequently been accompanied by an explanation of the cause, such as the prosperity of the company when an advance has been made and a decline in prices of products when a decrease has been made effective, but the latest announcement was in the simplest terms as follows:

"The wage rates of day labor at the manufacturing plants of the Steel Corporation have been increased about 20 per cent, to become effective September 1. Other rates will be equitably adjusted."

Other announcements by the Steel Corporation have been as follows:

Jan. 6, 1916, 10 per cent increase.
May 1, 1916, 10 per cent increase.
Dec. 15, 1916, 10 per cent increase.
May 1, 1917, 10 per cent increase.
Oct. 1, 1917, 10 per cent increase.
April 15, 1918, 15 per cent increase.
Aug. 1, 1918, 10 per cent increase.
Oct. 1, 1918, 8-hr. basic day adopted.
Feb. 1, 1920, 10 per cent increase.
May 16, 1921, 20 per cent decrease.
June 6, 1921, basic 8-hr. day abolished.
Aug. 29, 1921, decrease to 30c. per hr.

Following table shows the wages of common labor after each advance or decrease in wages by the United States Steel Corporation:

Date	Wages 10-Hr.	Date	Wages 10-Hr.
1915	$2.00	Aug. 1, 1918	$4.20
Feb. 1, 1916	2.20	Oct. 1, 1918	*4.62
May 1, 1916	2.50	Feb. 1, 1920	5.08
Dec. 15, 1916	2.75	May 16, 1921	†4.05
May 1, 1917	3.00	July 16, 1921	†3.70
Oct. 1, 1917	3.30	Aug. 29, 1921	3.00
April 15, 1918	3.80	Sept. 1, 1922	3.60

*Eight-hour basic day established and time and one-half paid for overtime.
†Approximated.

Independents Will Meet Advance—Higher Prices Expected

YOUNGSTOWN, Aug. 22.—Independents will meet the 20 per cent wage advance effective Sept. 1 announced by the Steel Corporation. The new common labor rate will be 36c. per hour. Wages of skilled and semi-skilled workers will be equitably adjusted. Since July 16, 1921, independent producers in this district have been paying common labor 30c. per hour, with straight time for all overtime. Previously the going labor rate in the Valleys had been 37c.

Independents which will participate in the advance are the Youngstown Sheet & Tube Co., Republic Iron & Steel Co., Brier Hill Steel Co., Trumbull Steel Co. and Sharon Steel Hoop Co. It is estimated 40,000 steel workers in the two Valleys will benefit.

As recent advances in steel were largely based solely on higher fuel charges, the 20 per cent advance in the labor cost of steel making points to still higher finished steel prices.

"Wage increase will place common labor in the steel mills slightly above the rate paid common labor on the railroads," says President James A. Campbell of the Sheet and Tube company. "The miners will receive wartime wages for another year and it is only fair that steel workers should get an advance."

NON-FERROUS METALS

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
Aug.	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
16.....	14.12½	13.75	32.62½	5.90	5.55	6.50	6.15
17.....	14.12½	13.75	32.87½	5.90	5.55	6.50	6.15
18.....	14.12½	13.75	32.75	5.90	5.55	6.52½	6.17½
19.....	14.12½	13.75	....	5.90	5.55	6.55	6.20
21.....	14.12½	13.75	32.75	5.90	5.55	6.57½	6.22½
22.....	14.12½	13.75	32.50	5.90	5.60	6.57½	6.22½

*Refinery quotations.

New York

NEW YORK, AUG. 22.

Only moderate activity prevails, but prices are steady to higher. Transactions in copper continue in fair volume with prices unchanged. A moderate business is reported in tin at slightly higher values. Demand for lead is good and prices are higher. Quotations for zinc are again advancing on only moderate transactions.

Copper.—Domestic demand for electrolytic copper continues in moderate volume and is being satisfied by one or two sellers at 14c., delivered, or 13.75c., refinery, for delivery throughout October, which we quote as the market. There are some large sellers who quote nothing less than ⅛c. above these levels. There is some demand for last quarter, for which 14.12½c., delivered, or 13.87½c., refinery, is obtained, but there are not yet any transactions for first quarter. Foreign demand continues steady. Lake copper continues quiet and firm at 14c. to 14.25c., delivered.

Tin.—Transactions in Straits tin since Aug. 15 have been practically confined to one day. On Aug. 16 fair sales of spot and nearby were made, amounting to 200 to 250 tons, with dealers almost exclusively the buyers, and the market a narrow one. On other days, including yesterday and to-day, the market has been dull and without feature. The slightly better prospect in the strike situation has imparted a better tone and, when a definite settlement finally comes, more active buying is expected. Spot Straits tin was quoted to-day at 32.50c., New York, and the London market was about £1 per ton higher than a week ago at £160 5s. for spot standard, £160 7s. 6d. for future standard and £161 5s. for spot Straits. Arrivals thus far this month have been 2515 tons, with 6210 tons reported afloat.

Lead.—The leading interest advanced its price yesterday, Aug. 21, from 5.75c. to 5.90c., New York, and from 5.55c. to 5.70c., St. Louis, or $3 per ton. A large demand is reported at these prices. In the outside market the metal can still be obtained in the West at 5.60c. to 5.65c., St. Louis, with the New York price still 5.90c.

Zinc.—Prices for prime Western have advanced in the week to 6.20c. to 6.25c., St. Louis, or 6.55c. to 6.60c., New York. This is due more to the sold up position of producers and their disinclination to sell than to any large demand. Hesitancy characterizes the attitude of most consumers and there is a speculative element in the market which is having some effect and which is meeting some of the light demand.

Antimony.—Wholesale lots for early delivery are still obtainable at 5.25c. per lb., duty paid, New York. There is no change in the general situation and demand is light.

Aluminum.—The leading interest continues to quote wholesale lots of virgin metal, 98 to 99 per cent pure, at 19.10c. per lb., f. o. b. plant, for early delivery and foreign metal of the same grade is obtainable from importing dealers at 17.75c. to 18c. per lb., New York, duty paid.

Old Metals.—The market continues strong and trading is fairly active. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	13.50
Copper, heavy and wire	12.75
Copper, light and bottoms	11.25
Heavy machine composition	10.50
Brass, heavy	8.25
Brass, light	6.50
No. 1 red brass or composition turnings	9.00
No. 1 yellow rod brass turnings	7.50
Lead, heavy	5.00
Lead, tea	4.00
Zinc	3.75

Chicago

AUG. 22.—Tin, lead and spelter have advanced on a quiet market. Lead is stronger, principally because of an advance yesterday by the leading producer. The firmness in zinc is accounted for in part by the inability of idle smelters to start production under present fuel conditions. Among the old metals, copper wire, crucible shapes and copper clips alone have advanced. We quote, in carload lots, lake copper, 14.25c.; tin, 33.50c. to 34c.; lead, 5.75c.; spelter, 6.35c.; antimony, 7c.; in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 11c.; copper bottoms, 9.25c.; red brass, 8.75c.; yellow brass, 6.75c.; lead pipe, 4.50c.; zinc, 3.50c.; pewter, No. 1, 20c.; tin foil, 22.50c.; block tin, 26c., all buying prices for less than carload lots.

St. Louis

AUG. 22.—The lead market is higher at 5.55c. carlots; slab zinc is steady at 6.30c. On old metals we quote light brass, 3.50c.; heavy red brass and light copper, 7c.; heavy yellow brass, 4c.; heavy copper and copper wire, 7.50c.; zinc, 2c.; lead, 3c.; pewter, 15c.; tin foil, 16c.; tea lead, 2c.; aluminum, 9c.

Cost of Living Slightly Higher

Monthly figures of the Bureau of Labor Statistics show the wholesale prices of all commodities during July to be 55 per cent above the average for 1913, compared with 50 per cent in June. Six of the nine individual groups showed a rise in July compared with June. Chemicals and house-furnishings showed slight decreases.

Metals and metal products, which now stand at 21 per cent above the 1913 average, are far lower than the average group. This item is now 14 points below farm products. The highest item on the list is now fuel and lighting.

Our table shows the figures for the two most recent months and for July, 1921, and the peak in 1920. It shows also the amount of liquidation, between the 1920 peak prices and the present, of the excess of the peak prices over the average of 1913. Metals have been liquidated to a greater extent than any other specific group except chemicals.

Index Numbers of Wholesale Prices, by Groups of Commodities

(1913 equals 100)

	1920 Peak	1921 July	1922 June	1922 July	Liquidation, Per Cent
Farm products	247	119	131	135	76.2
Food, etc.	248	141	140	142	71.6
Cloths and clothing	346	172	179	180	67.5
Fuel and lighting	281	186	225	254	14.9
Metals and metal products	203	124	120	121	79.6
Building materials	300	160	167	170	65.0
Chemicals and drugs	213	129	122	121	81.4
House-furnishings goods	275	180	176	173	58.3
Miscellaneous	208	123	114	114	87.0
All commodities	247	141	150	155	62.6

Figures of the National Industrial Conference Board, based on the workman's family budget, show an increase of 0.1 per cent in July over June. Food and clothing are higher and sundries lower than in June. Shelter and fuel remained unchanged. The cost of living is now placed at 55.6 per cent above that of July, 1914. It has been slowly rising since the low figure (54.7 per cent above 1914) registered in March. In July, 1921, it was 63.1 per cent above 1914; in July, 1920, the peak was reached at 104.5 per cent above 1914.

PERSONAL

Parker F. Wilson has been elected vice president of the Otis Steel Co., Cleveland, filling the vacancy caused by the recent resignation of H. F. Deverell. Mr. Wilson has been with the Otis company 10 years, starting as field engineer, and later went through successive promotions, being mill superintendent and general superintendent and recently assistant to the president and general manager. B. D. Quarrie succeeded him this month as general manager.

Maj. David A. Reed, who last week took oath of office as Senator from Pennsylvania, by appointment of Governor Sproul, to complete the unexpired term of the late Senator Crow, was one of the leading attorneys of the U. S. Steel Corporation in the dissolution suit brought against it by the Government. He made a very able argument in the Supreme Court. He is a son of Judge J. H. Reed, who has long been counsel for the Steel Corporation.

E. M. Wise, who recently assumed the position of Pittsburgh district manager, Alliance Machine Co., Alliance, Ohio, formerly for 23 years had been identified with the Westinghouse Electric & Mfg. Co., the last 12 years in charge of the resale division, industrial department, Pittsburgh district office. Mr. Wise is a native of Maryland. After completing the apprenticeship course of the Westinghouse company, he was sent to England to assist in the construction of the British Westinghouse plant at Manchester and did road and construction work in England for about three years.

E. M. WISE

A. L. Rea has become general manager, and W. H. Watt superintendent of the Federal Radiator Co., Zanesville, Ohio. This company has resumed operations in its foundry after being shut down for about a year.

Paul Brooks, manager of the Philadelphia office of the Deveboise-Anderson Co., pig iron and coke, has been elected a director of the Temple Furnace Co., Temple, Pa.

P. D. Brown, who for the past 13 years has been Baltimore branch manager of the Crucible Steel Co. of America, resigned on Aug. 15.

Harry H. Bean, for 45 years identified with the Thomas Mfg. Co., manufacturer of agricultural implements, Springfield, Ohio, has been elected president to fill the vacancy caused by the death of William S. Thomas, who died several months ago. The other officers elected are: First vice-president and treasurer, Wallace S. Thomas; second vice-president, C. A. Schaefer; secretary, C. L. Aldrich. The directors are the officers and the following: B. J. Carr, Richmond, Ind.; J. L. Thomas and F. S. Thomas, Springfield. Mr. Schaefer has been with the company 32 years and Mr. Aldrich 25. Mr. Bean has been secretary and sales manager for several years.

Ernest J. Wood, who for two years has been working on the cost and factory control system outlined by Scovell, Wellington & Co., for the steel enameling industry, has resigned as manager of the factory control department at the Terre Haute, Ind., plant of the Columbian Enameling & Stamping Co., accepting a position with the Automatic Electric Co., Chicago. Previous to the war, he was with the Westinghouse Electric Co., doing cost and industrial engineering work at the East Pittsburgh plant.

C. H. Hobbs, formerly district sales manager of the Lackawanna Steel Co. at Detroit, has been appointed vice-president in charge of sales of the Detroit Seamless Steel Tubes Co., Detroit, effective Aug. 14. C. C. Rosser will continue as general manager of sales.

David S. Green, Hartford, Conn., has been appointed assistant trade commissioner to Paris, France. Mr. Green has been employed in the Bureau of Foreign and Domestic Commerce of the Department of Commerce since July, 1920.

Oswald Fowler, of Rogers, Brown & Co., 30 Church Street, New York, sailed Saturday, Aug. 19, for Europe, to be gone about one month.

George R. Woods, manager, R. S. Stokvis, Inc., New York, plans to leave for Europe on Sept. 16 for a six weeks trip to Holland, Belgium, France and England.

New Officers of Steel Treaters

The tellers of election have counted the ballots cast by the membership of the American Society for Steel Treating and the following new officers have been elected: President, T. D. Lynch, research engineer Westinghouse Electric and Manufacturing Co., East Pittsburgh, Pa.; second vice-president, W. S. Bidle, president W. S. Bidle Co., Cleveland, Ohio; secretary, W. H. Eisenman, 4600 Prospect Avenue, Cleveland; director, S. M. Havens, assistant treasurer and manager, Ingalls-Shepard Division, Wyman Gordon Co., Harvey, Ill.

T. D. LYNCH

The board of directors of the Society will be composed of the newly elected officers and the following: First vice-president, R. J. Allen, metallurgist Rolls-Royce Co. of America, Springfield, Mass.; treasurer, J. V. Emmons, metallurgist Cleveland Twist Drill Co., Cleveland; director, J. J. Crowe, metallurgist Philadelphia Navy Yard, Philadelphia; Director, A. E. White, past-president, director engineering research University of Michigan, Ann Arbor, Mich.; director, F. P. Gilligan, past-president, secretary-treasurer Henry Souther Engineering Co., Hartford, Conn.

The new officers will begin their duties at the close of the annual convention of the society at Detroit Oct. 2 to 7.

Directory of Ohio Metal Working Industries

A directory of the metal working industries of Ohio, intended for use in establishing a buying or selling contact with this field, serving as a ready and reliable source of information and as an authentic mailing list, has been published by the Buckeye Listing Co., 208 St. Clair Avenue, N.W., Cleveland.

The directory is 8½ x 11 in., bound in paper and contains 168 pages, 141 of which are devoted to the lists. The arrangement is alphabetically by towns and cities and under these are grouped the names, addresses and names of executive personnel of the various companies in the metal working field, symbols at the left of the name denoting the nature of the companies' operations. An index of the cities and towns is included, as well as a page explaining the various symbols.

It is planned to issue this service yearly. The price is $8, plus postage and insurance.

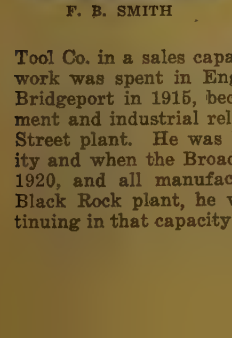
Prof. A. T. Kinsey, advisory service engineer, Air Reduction Sales Co., will address the Metropolitan section of the American Welding Society on the "Manufacture and Use of Welding and Cutting Gases," at a meeting of the section in New York, Sept. 12.

OBITUARY

JOHN OSBORNE PEW, 68, former president of the old Youngstown Iron & Steel Co., Youngstown, Ohio, absorbed in 1917 by the Sharon Steel Hoop Co., Sharon, Pa., died Aug. 19 at his home in Ravenna, Ohio, following an illness of two years. Mr. Pew was for many years one of the active figures in the iron and steel industry of the Mahoning Valley. He was born Sept. 7, 1854, in Brookfield, Trumbull county. Upon completion of his schooling in 1873, he became identified with a sheet iron mill at Niles, Ohio. Next he joined the McCormick Harvesting Machine Co., Chicago, as a traveling salesman in the Middle West. After engaging for seven years in the hardware business at Ashtabula, Ohio, Mr. Pew removed to Youngstown, where, in 1894, he became one of the organizers of the Youngstown Iron & Steel Roofing Co., with which he served as vice-president and general manager. Subsequently its name was changed to the Youngstown Iron & Steel Co., and in 1913 Mr. Pew was elected president and general manager, a position he retained until the property was disposed of. Mr. Pew was likewise a director of the Youngstown Pressed Steel Co., now a subsidiary of the Sharon Steel Hoop Co., of the Mahoning Foundry & Machine Co., and of the Commercial National Bank, Youngstown. He was one of the organizers of the Marsh-Capron Mfg. Co., Chicago, which he also served as vice-president and director. Following his retirement in 1917 from the Youngstown Iron & Steel Co., Mr. Pew purchased the Dan R. Hanna farm near Ravenna, where he had since engaged in stock raising with his son, William H. Pew, who had been professor and general manager of the Iowa Agricultural College, in the animal husbandry department. He was a member of the Union Club, Cleveland; the Youngstown Club and the Ohio Society of New York.

JOHN O. PEW

FRANK BURR SMITH, Milford, Conn., works manager of the Bullard Machine Tool Co., Bridgeport, Conn., died August 16, at Grace Hospital, New Haven, Conn., after a short illness. He was in his 50th year, having been born at Mohican Springs Farm, Fairfield, Conn., Nov. 22, 1872. He obtained an education in the public schools, and after leaving the high school of Bridgeport, entered the employ of the Bullard Machine Tool Co. as a machinist apprentice. Upon completing his apprenticeship, he was connected with the company's engineering department until 1894, when he went to Colorado. He was engaged in various positions in the East and West and returned in 1911 to the Bullard Machine Tool Co. in a sales capacity. The last year of his sales work was spent in England in 1914. He returned to Bridgeport in 1915, becoming manager of the employment and industrial relations department at the Broad Street plant. He was highly successful in this capacity and when the Broad Street plant was disbanded in 1920, and all manufacturing was transferred to the Black Rock plant, he was made works manager, continuing in that capacity until his death.



F. B. SMITH

JOHN W. RAPP, College Point, Queens, president of the Empire Art Metal Co., dropped dead last Wednesday night, Aug. 16, in the Bellevue-Stratford Hotel, Philadelphia, from apoplexy at the age of 61. The steel parts for fireproof buildings which Mr. Rapp devised and manufactured have been used in many of New York's large buildings.

THEODORE HAMMETT COLVIN, dean of Providence, R. I., foundrymen, and founder of the Colvin Foundry Co., died Aug. 13 at his home, 435 Elmwood Avenue, that city, in his seventy-sixth year, following an illness of two weeks. Born in Plainfield, Conn., in 1846, he went to Providence in 1872 after learning the trade of molder in Danielson and Worcester, Mass. Forming a partnership under the name of G. & T. H. Colvin, Mr. Colvin in 1876 bought controlling interest, and in 1896 incorporated as the Colvin Foundry Co. In 1917 he retired from active business, turning over the management of the business to his two sons.

SAMUEL H. CARPENTER, president and general manager of the Atlas Drop Forge Co., Lansing, Mich., died suddenly on Wednesday morning, July 26.

LOUIS FOLLET, president Standard Tin Plate Co., Canonsburg, Pa., died at the Homeopathic Hospital, Pittsburgh, Aug. 17, as a result of injuries sustained in an automobile accident Aug. 16. His death removes a man who has been identified with the tin plate industry practically from its inception in this country, as he was among those who learned the business in Wales and came to this country about the time the McKinley tariff law made possible the establishment of the industry in this country. He was born in Melbourne, Australia, 58 years ago, his father at that time being French consul-general of Australia. Following his graduation from the University of Paris he emigrated to Wales, where he learned the tin plate trade. He came to this country when 24 years of age, and became identified with the Morewood Tin Plate Co., Gas City, Ind., which was absorbed by the American Tin Plate Co. He came to Pittsburgh in 1901 as commercial manager of the Standard Tin Plate Co., which in that year started its plant at Canonsburg, Pa. He was an active figure in the steel trade circles in Pittsburgh and was a member of the Pittsburgh Field Club, the Union Club, the Fellows Club and the Pittsburgh Athletic Association. He made his home in Carrick, a suburb of Pittsburgh. Mrs. Follet, three sons and a daughter, Mrs. Robert Eaton, survive.

LOUIS FOLLET

JOHN C. NEFF, for many years identified with the coke and coal business in western Pennsylvania, died in the Howard Kelley Hospital, Baltimore, Aug. 15. Until illness forced his retirement about three years ago, he was general manager, Connellsville Central Coke Co., with offices in Pittsburgh. He was born in Masontown, Pa., 68 years ago, and lived most of his life in Pittsburgh.

RICHARD D. REED, formerly with the H. B. Smith Co., Westfield, Mass., heating appliances, died at his home in that city Aug. 16, at the age of sixty years. Mr. Reed was known for his many improvements in the construction of heating boilers.

MESHECH FROST, president National Machinery Co., Tiffin, Ohio, died Aug. 6 after a three week's illness, age 75 years. He was prominent in civic and industrial activities in Tiffin and took an active part in the organization of the National Machinery Co., after which he disposed of his interest. Twenty years ago he re-purchased a large interest in the company and effected its reorganization and had been its president since that time.

British Iron and Steel Market

United States Still Buying British Pig Iron—British Steel in Better Demand, Due to Exchange Chaos

(By Cable)

LONDON, ENGLAND, Aug. 22.

America has made further purchases of Scotch pig iron and there are additional inquiries for 1500 tons of special Cleveland foundry iron. Some Cleveland producers are fixing an export premium on No. 3 G. O. B. Home buying is dull.

East Coast hematite is weak. Mixed parcels of hematite coke have been sold to America. East Coast mixed numbers are being done at 89s. ($19.94) and less.

There is improved demand for British steel and more business, owing mainly to the chaotic condition of Continental exchanges. India has bought plates; steel bars have been sold to Australia at £7 17½s. (1.58c. per lb.) f.o.b. South America has purchased hoops, plates and sheets; ⅛-in. plates have been sold for £9 17½s. (1.975c. per lb.)

A Belfast shipyard has secured an order for an Atlantic liner. Yarrow is reopening the Scotstoun plant.

Continental steel sales are quieter, owing to uncertainty as to the course of prices. India has bought sheets. Merchant bars and sections have been sold to South America. China has purchased plates, angles and checker plates.

Tin plate is quiet but steady. Export buying generally is dull. Japan is inquiring for some and buying is increasing.

There is some demand for galvanized sheets for Australia, India and the Far East, and small sales have been made. Quotations are firm.

Little business is being done in black sheets. Belgian 6/8's are quoted at £11 (2.20c. per lb.) f.o.b. India has bought Continental 2/5's at £10 7½s. (2.08c. per lb.) c.i.f. Scotch makers have reduced prices, quoting 28-gage under £13 (2.60c. per lb.) f.o.b.

We quote per gross ton, except where otherwise stated, f.o.b. maker's works, with American equivalent figured at $4.48 per £1, as follows:

Durham coke, delivered	£1 6s.	to £1 7s.	$5.82 to $6.05
Cleveland No. 1 foundry	4 15		21.28
Cleveland No. 3 foundry	4 7	& 4 10*	19.49 & 20.16*
Cleveland No. 4 foundry	4 5	to 4 7	19.04 to 19.49
Cleveland No. 4 forge	4 2½	to 4 5	18.48 to 19.04
Cleveland basic	4 0		17.92
East Coast mixed	4 9	to 4 10*	19.94 to 20.16*
Ferromanganese	15 0		67.20
Ferromanganese*	14 10	to 14 15	64.96 to 66.08
Rails, 60 lb. and up	7 15	to 9 0	34.72 to 40.32
Billets	7 0	to 8 0	31.36 to 35.84
Sheet and tin plate bars, Welsh	7 7½		33.04
Tin plates, base box	0 19⅛	to 0 19½	4.28 to 4.37
			C. per Lb.
Ship plates	9 0	to 9 10	1.80 to 1.90
Boiler plates	11 10	to 12 10	2.30 to 2.50
Tees	9 5	to 10 5	1.85 to 2.05
Channels	8 10	to 9 10	1.70 to 1.90
Beams	8 5	to 9 5	1.65 to 1.85
Round bars, ¾ to 3 in.	9 5	to 10 0	1.85 to 2.00
Galvanized sheets, 24 g.	16 5	to 16 10	3.25 to 3.30
Black sheets	12 0		2.40
Steel hoops	12 0	& 12 5*	2.40 & 2.45*
Cold rolled steel strip, 20 g.	23 2½		4.63
Cotton ties, Indian specifications	15 0		3.00

*Export price.

Continental Prices, All F. O. B. Channel Ports, Delivery as Specified

No. 3 foundry pig iron:			
Belgium, September	£4 0s.		$17.92
Luxemburg, Sept.	4 0		17.92
France, September	4 0		17.92
Billets:			
France	5 15		25.76
Luxemburg	6 5		28.00
Lorraine	6 5		28.00
Wire nails (keg basis):			
Germany, August	0 14½		3.25
Belgium	0 20½		4.59
Wire rods, 5 mm. (0.2 in.):			
Belgium	7 5	to £10 7½s.	32.48 to $46.48
Angles:			C. per Lb.
Belgium, September	7 7½		1.48
Tees:			
Belgium	8 5		1.65
Merchant bars:			
Belgium, October	7 7½	to 7 15	1.48 to 1.55
Luxemb'g, October	7 7½	to 7 15	1.48 to 1.55
Germany, October	7 15	to 7 17½	1.55 to 1.58
France, October	7 7½	to 7 15	1.48 to 1.55
Channels:			
Belgium	7 10	to 7 12½	1.50 to 1.53
Joists (beams):			
France, Sept., Oct.	7 0	to 7 5	1.40 to 1.45
Belgium, Sept., Oct.	7 0	to 7 5	1.40 to 1.45
Luxemb'g, Sept., Oct.	7 0	to 7 5	1.40 to 1.45
¼-in. plates:			
Germany, Sept.	8 0	to 8 5	1.60 to 1.65
Belgium, Sept., Oct.	7 10	to 8 0	1.50 to 1.60
Luxemburg and France, not offered.			
⅛-in. plates:			
Germany	9 0		1.80
No. 8 gage wire:			
Belgium, August	14 10⅝		2.91

Heavy American Demand for British Coal—Some Pig Iron Still Sought by United States

LONDON, ENGLAND, Aug. 10.—During the past fortnight business in the iron and steel trades has been affected by holiday intervals, but now that these are more or less over, trading is getting on its feet again. The outlook, however, is none too bright, especially in view of the precarious political situation, which naturally makes for nervousness. Moreover, all over the country are cropping up fresh individual difficulties, the latest concern to go into voluntary liquidation being the Brotherton Ediswan Tubes & Conduits Co. A large merchant firm, doing some considerable business with the East, has also failed, the liabilities totaling over £1,000,000, but of this total only a small portion is concerned with the iron and steel trades, the major being concerned with textiles.

In the meantime, however, coal markets are showing considerable strength, and prices in numerous cases have been advanced. The American demand for British coal continues, and over last week-end about 500,000 tons were booked, both for the United States and Canada, which means that the total booked so far must be over 1,500,000 tons, and the delivery is spread over September and into October.

America is also endeavoring to continue buying pig iron here. Last week a parcel of 1000 tons of special Cleveland foundry iron was shipped but, since the taking of that order, an increase of 4 to 5s. (89c. to $1.11) was incurred in the freight rate from Glasgow to Boston, and this of course has made further business in this connection impossible. We also hear of Continental pig iron being sold to the United States, and understand that shipments of Belgian material have already been made. Germany is also buying moderately of hematite pig iron.

As regards the home trade for pig iron here, there is not much of interest that is moving and prices of Cleveland continue fairly steady, with No. 3 G. M. B. quoted at 87 to 88s. ($19.31 to $19.54). Scotch pig iron is somewhat firmer on increased values of fuel, and sellers of No. 3 Scotch foundry now ask 100s. ($22.20) f.o.b. Glasgow.

The fixing of steel prices for the home trade, by the Association of Scottish and North-Eastern steel makers, has been abandoned for a month, and steel quotations in consequence have been lowered for the home trade, ranging from 5 to 30s. ($1.11 to $6.66) drop. It has been anticipated that this step would have to be taken, as a considerable amount of business for shipbuilding material has been placed with North-Eastern makers since steel makers were given the option of selling at export prices to bridge builders and others in this country, on the condition that the bridge building material was for shipment overseas.

Generally speaking, however, ordinary merchant business in steel is hard to find, and it remains to be seen whether this cut in prices will have the desired effect. Export prices are quotably unchanged, but it is possible to do business below the minimum figures mentioned, steel bars having sold at £8 17½s. (1.76c. per lb.) f.o.b. British prices, of course, are still above those quoted by Continental makers, but whereas our makers can give almost prompt delivery, purchasers from the Continent must wait six to eight weeks.

Machinery Markets and News of the Works

PROSPECTS IMPROVING

Machine-Tool Trade Looks for a Good Fall Demand

Lima Locomotive Works Inquiries for About 25 Machines—Purchases May Total $500,000

Despite the fact that the coal and railroad strikes continue to restrict buying of machine tools, manufacturers of tools are more hopeful than they have been at any time in the past two years. Prospects of a very substantial improvement in the volume of buying are multiplying. While many buyers whose inquiries have been sent out in the past two months have held back purchases pending the final settlement of strike troubles they have asked to be kept advised of any price changes so that they may place their orders before such advances take effect.

During the past week some manufacturers of milling machines, shapers and turret lathes have notified the trade of higher prices on their lines and a hack saw manufacturer has advanced prices about 6 per cent.

Prominent among the new inquiries is that of the Lima Locomotive Works, Lima, Ohio, which asks prices on about 25 heavy tools for plant extensions. It is stated that its purchases will total about $500,000. It recently ordered eight or ten Shaw traveling cranes. Its requirements include eight or ten 6-ft. radial drills, boring mills, engine lathes, slotters, turret lathes, etc.

The J. A. Fay & Egan Co., Cincinnati, is expected to issue an inquiry for a fairly large quantity of machinery for its new plant, for which nine cranes and a number of hoists were recently purchased.

Agricultural implement and machinery manufacturers, particularly those making farm power equipment, are coming back into the market in a small way, which is an encouraging sign, as they have not been buyers of tools for two years or more. Industrial companies are buying conservatively. The Studebaker Corporation, South Bend, Ind., and the Continental Motors Co., Muskegon, Mich., continue to round out their recent purchases by the addition of a few machines. In the East the principal buying has been done by the Spicer Mfg. Corporation, Plainfield, N. J., and the Wright Aeronautical Corporation, Paterson, N. J., the latter taking used tools exclusively.

Railroads are buying a few single tools, but action on the large lists which have been pending for some time is still being deferred.

New York

NEW YORK, Aug. 22.

BOTH inquiries and orders for machine tools are in light volume, prospective buyers in most instances holding off until there is a more definite outlook as to coal supply and railroad transportation. The needs of the railroads for shop equipment are evidenced by occasional small orders, but the larger requirements of the roads continue to be held in abeyance. The New York Central has ordered a duplex boring machine, the Missouri Pacific has bought a 2500-lb. steam hammer, and the Los Angeles street railroad has ordered a No. 1 carwheel lathe, all of this business coming to a New York company.

The Wright Aeronautical Corporation, Paterson, N. J., has continued its buying of used tools, the enlargement of its shop facilities being due to a contract recently received from the U. S. Government for airplane motors. The Spicer Mfg. Corporation, Plainfield, N. J., has been buying new equipment for its plants. The Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., will probably buy this week five vertical boring mills, 44-in., and two 6-ft. radial drills.

Inquiry for cranes has fallen off and few orders are being placed.

The Nevada Consolidated Mining Co., New York, has bought a 40-ton Shaw crane for one of its Western mines. Sanderson & Porter, New York engineers, have bought a 40-ton Milwaukee crane for the Springfield Gas & Electric Co.'s power plant at Springfield, Mo. The United Lead Co. will probably buy several 5-ton monorail hoists for its plant at Perth Amboy, N. J. A 25-ton grab-bucket locomotive crane has been ordered from the Industrial Works, Bay City, Mich., by the Wilkoff Co., Youngstown, Ohio, for its scrap yard.

The Queens Borough Gas & Electric Co., 347 Central Avenue, Brooklyn, will build a new two-story electric power house at Lynbrook, L. I. Morrell Smith, Far Rockaway, L. I., is architect.

A vocational department will be installed in the new two-story high school to be erected at Amityville, L. I., estimated to cost $200,000, for which bids on a general contract will be received until Sept. 30.

H. Medalie, 460 East 164th Street, New York, operating a machine shop at 961 Washington Avenue, is planning for the installation of new equipment.

Fire, Aug. 17, destroyed the garage, service and repair shop of Samuel Kaufman, 752-60 Bedford Avenue, Brooklyn, with loss approximating $75,000, including equipment and damage to cars.

The Estate of Gustave Schock, 514 West Fifty-seventh Street, New York, has awarded contract to the Turner Construction Co., 244 Madison Avenue, for an eight-story automobile service and repair building, 75 x 100 ft., at 503-7 West Fifty-sixth Street, estimated to cost $150,000. Howard Chapman, 315 Fifth Avenue, is architect.

The Goodwin-Gallagher Sand & Gravel Corporation, 21 East Fortieth Street, New York, will install equipment at its plant at Port Washington, L. I., for the elimination of the pollution of the waters of Hempstead Harbor, caused by screening and separating work. The plant forms a portion of the local property of the War Department and gives employment to about 300.

The superintendent of State prisons, Capitol Building, Albany, N. Y., will extend the power house at Clinton Prison, Dannemora, N. Y., to include the installation of additional equipment. Charles F. Rattigan is superintendent.

Goldberg & Chadkin, New York, have leased the building now being erected at Whitlock and Bryant avenues, for twenty-one years, for the establishment of an automobile service and repair works.

W. R. Ostrander & Co., 371 Broadway, New York, manufacturers of electrical equipment and supplies, have taken title to the six-story factory at 83-91 Clifton Place, Brooklyn, for a new plant. It is now operating a branch factory at 193 Broadway, Brooklyn.

The New York Air Brake Co., 165 Broadway, New York, with plant at Watertown, N. Y., is arranging for stock issue to approximate $5,000,000, of which about $500,000 will be used for extensions and improvements, additions to working capital, etc.

A vocational department will be installed in the new high school and grade school, two-stories, 60 x 175 ft., to be erected at Mamaroneck, N. Y., estimated to cost about $215,000, for which bids will close about Sept. 1. A. G. C.

Fletcher, 157 East Forty-fourth Street, New York, is architect.

The United States Rubber Co., Broadway and Fifty-eighth Street, New York, has disposed of a bond issue of $7,000,000, a portion of the proceeds to be used for plant extensions and improvements, financing, etc. C. B. Seger is chairman of the board.

S. B. Allen, 506 West 113th Street, New York, will build a three-story automobile service and repair works, 50 x 100 ft., on Bronx Street, estimated to cost $60,000. Adolph Mertin, 34 West Twenty-eighth Street, is architect.

John Viviani, New York, has leased the building, 75 x 100 ft., at 332-36 East Thirty-fifth Street, for a term of years for the establishment of an automobile service and repair works.

Emile Gauthier, New York, has leased the building at 4507 Third Avenue for the operation of an automobile service and repair works.

The Brazilian Traction, Light & Power Co., Rio de Janeiro, Brazil, is arranging a fund of more than $3,000,000 for the construction of a new electric generating plant about 100 miles from the city, to have a capacity of about 140,000 hp.

The Morristown Electric Steel Co., 13 Water Street, Morristown, N. J., recently organized, has acquired the former plant of the Liberty Steel Co., in the Shelley Terminal section, for the manufacture of electric steel castings. The company is headed by Richard A. Eurich, Samuel B. Illingworth and J. Lovell Paulmier.

Hoisting equipment, conveyors, loading and unloading machinery, etc., will be installed in the plant to be erected on Pavonia Avenue, Jersey City, N. J., by the Standard Milling Co., 49 Wall Street, New York, comprising a six-story building, 90 x 380 ft., estimated to cost about 1,000,000. A complete blending plant will be operated in connection with the main warehouse. A subsidiary organization, the Standard Warehouse Corporation, is being formed to operate the plant. The Baxter Engineering Co., Ellicott Square, Buffalo, is engineer. A. P. Walker is president.

The Kimberley Phonograph Co., 228 Fayette Street, Perth Amboy, N. J., manufacturer of talking machine equipment and parts, has been reorganized as the Kimberley Phonograph Co. of New Jersey. Plans are under way for enlargements, to include remodeling a portion of the present works and additional equipment. Leo Jacobson is president.

Freight-handling, loading and conveying machinery, industrial trucks, etc., will be installed in the new two-story, reinforced-concrete freight house to be erected by the Lehigh Valley Railroad Co., at the foot of Chapel Avenue, Jersey City, N. J., estimated to cost $650,000.

A vocational department will be installed in the new war memorial school to be erected in the Second Ward Park, Passaic, N. J., estimated to cost about $800,000. Plans have been prepared.

R. Mazzoni, 584 Ninth Street, West New York, N. J., has had plans prepared for a one-story automobile service and repair works, 75 x 90 ft., at Ninth Street and the Boulevard, estimated to cost about $35,000. Leo Feinen, 3697 Boulevard, Jersey City, N. J., is architect.

Hoisting equipment, conveying apparatus and other material-handling machinery will be installed in the six-story warehouse, 175 x 200 ft., to be erected on Newark Avenue, Jersey City, N. J., by I. M. Barren, care of the Industrial Engineering Co., 30 Church Street, New York, engineer, estimated to cost about $300,000. Leo Feinen, 3697 Boulevard, Jersey City, is architect.

The Board of Education, City Hall, Newark, N. J., will take bids until Aug. 31, for a new cast iron boiler, repairs to present boilers and grates at a number of schools, as per specifications on file at the office of Cephas I. Shirley, business manager, third floor, City Hall.

The Public Service Electric Co., Newark, has authorized the preparation of plans for an addition to its Essex Power Station, Point-no-Point, estimated to cost $4,250,000 with machinery. N. A. Carle is chief engineer.

The Pittsburgh Plate Glass Co., 290 Elizabeth Avenue, Newark, has filed plans for the erection of two new buildings at its local plant, to be one-story, 66 x 110 ft., to cost $160,000, and four-stories, 46 x 46 ft., to cost $40,000.

R. Gasior, 310 Washington Avenue, Elizabeth, N. J., will purchase a wire-bending, pointing and die-casting machine.

The De Cozen Motor Car Co., 20-24 Branford Place, Newark, has completed plans for a three-story service and repair building, 50 x 180 ft., at 968-70 Broad Street, estimated to cost about $80,000. Frank Grad, 245 Springfield Avenue, is architect.

George W. Heath & Co., 208 First Street, Newark, manufacturers of fountain pens, are in the market for a used automatic screw machine, Brown & Sharpe, late model, in good condition.

In connection with the removal of its plant to Little Falls, N. J., the Mercury Radio Products Co., 51 Thomas Street, Orange, N. J., has been reorganized as a State corporation, with capital of $100,000, to succeed a former partnership. The Little Falls plant will be given over to the manufacture of radio sets and parts. Myron S. Shiels is president, and Edmund B. Osborne, Jr., treasurer.

The National Carbon Co., 30 East Forty-second Street, New York, manufacturer of electric equipment, etc., has arranged for the operation of two new finishing plants for emergency service at 337 East Forty-first Street, New York, and 560 West Congress Street, Chicago, respectively. They will be used to supplement the emergency works now operated at the main plant at Cleveland.

Charles L. Cadle, superintendent of Public Works, Albany, N. Y., will receive bids until Sept. 6, for a power house and all work incidental thereto at the Crescent Dam, Cohoes, N. Y., to be used in connection with the power development project on the State barge canal.

Philadelphia

PHILADELPHIA, Aug. 21.

ELECTRIC motors, conveying and other mechanical equipment will be installed in the new four-story, reinforced-concrete plant to be erected at Memphis and Eyre streets, Philadelphia, by the A. J. Reach Co., Tulip and Palmer streets, manufacturer of sporting goods, estimated to cost about $120,000, with machinery. A general contract has been let to the F. W. Mark Construction Co., Commercial Trust Building.

H. Kaiser & Co., Inc., Twenty-third and Race streets, Philadelphia, manufacturer of automobile bodies, has acquired a group of factory buildings at Schuylkill Avenue and Catherine Street, on a site 200 x 260 ft. The property will be used for a new plant.

The Keystone Power Corporation, Philadelphia, has issued bonds for $719,000, the proceeds to be used for the purchase of property of the State Center Electric Co., Center County, including plant and system, and for extensions and improvements. A fund of $25,000,000 has been authorized, to be used as required for expansion.

The Trenton Steel & Wire Co., 599 Ingham Avenue, Trenton, N. J., recently acquired by the Maryland Steel Co., Baltimore, has preliminary plans under consideration for enlargements for the production of cold-rolled flat wire. It is proposed to provide facilities for about 80 men, as compared with about one-third this number at the present time. A three-shift operating schedule will be adopted in the near future. John Robinson is managing director.

Reorganization plans are being perfected by a committee of trustees of the Empire Tire & Rubber Co., East Clinton Avenue and Mulberry Street, Trenton, N. J. New working capital to an amount of $600,000 will be provided for operation and expansion. The new company will be headed by former Governor E. C. Stokes, W. T. Baird, A. W. Pickford and H. J. Lyall.

A vocational department will be installed in the new two-story and basement high school, 75 x 100 ft., to be erected at West Reading, Pa., excavations for which will be made at an early date. Edward E. Scholl, 136 Robeson Street, Reading, is architect.

The Montgomery Foundry & Fittings Co., Conshohocken, Pa., is planning for the erection of a new foundry with output of about 100 tons a day.

The Scranton Electric Co., Scranton, Pa., has arranged for a bond issue of $373,000, a portion of the proceeds to be used for extensions and improvements.

S. D. Chandler, 82 Main Street, Carbondale, Pa., is planning the erection of a three-story automobile service and repair works to replace the plant recently destroyed by fire. It will cost close to $50,000.

The Board of Directors, Mary M. Packer Hospital, Edward Rohrback, president, Sunbury, Pa., has revised plans in progress for a new one-story power house. W. R. Rockefeller, 214 Market Square, is architect.

The Lehigh Coal & Navigation Co., Lansford, Pa., will commence the immediate construction of new coal-loading docks and storage plant on the Lehigh Canal, near Northampton, Pa., to replace its present plant at Coalport, near Mauch Chunk, Pa., which it is proposed to abandon. The docks will be of reinforced concrete, and will be equipped

with cranes and complete loading machinery; the storage plant, similarly equipped, will have a capacity in excess of 2,000,000 tons. The project will cost about $500,000, including machinery.

W. L. Craig, Twelfth Avenue, Sharpsville, Pa., is planning for the establishment of a new machine shop. A list of equipment will be prepared at an early date.

The East Penn Electric Co., Pottsville, Pa., is perfecting plans for the merger of 13 electric companies, operating in different parts of Schuylkill County, as approved by the Public Service Commission. Extensions and improvements will be made in plants and system. C. A. Hall is president.

J. W. Miller, Bareville, Pa., is planning to rebuild his automobile radiator shop and sheet-metal works, destroyed by fire Aug. 17.

The Frick Co., Waynesboro, Pa., manufacturer of refrigerating machinery, etc., is reported to be planning the purchase of a number of traveling cranes, 5, 10 and 25 tons capacity.

The Luzerne County Gas & Electric Co., Wilkes-Barre, Pa., is planning for extensions and improvements in its plant and system to cost about $200,000.

The Board of Directors, Knights of Malta, Granville, Pa., will commence the immediate erection of a new two-story power house, 26 x 60 ft. Harvey T. Hauer, 829 Cumberland Street, Lebanon, Pa., is architect.

The Clinton Natural Gas & Oil Co., Williamsport, Pa., is planning for the installation of new pumping machinery at its plant in the Kettle Creek Field. D. D. Kline is secretary in charge.

A. N. Greenfield, Fifteenth and Chestnut streets, Philadelphia, is taking bids for the erection of a three-story automobile service and repair plant, 26 x 100 ft., estimated to cost about $200,000. F. E. Hahn, 1112 Chestnut Street, is architect.

Buffalo

BUFFALO, Aug. 21.

THE International Casement Co., 84 Hopkins Street, Jamestown, N. Y., manufacturer of rolled steel and bronze window casements, will commence the erection of a one and one-half story addition, 120 x 150 ft.

The Dynamo & Motor Exchange, 41 Court Street, Buffalo, has acquired a two-story building, totaling about 7000 sq. ft. of floor area, at 45 Elm Sreet, for the establishment of a new motor and electrical shop for parts production, repairs, etc. A portion of the structure will be used as a warehouse.

The Umbsen Mfg. Co., 155 Sanford Street, Rochester, N. Y., manufacturer of spraying devices, etc., has tentative plans under consideration for the establishment of a new branch factory at San Francisco. R. E. Chester is seretary.

The plant of the Tonawanda Board & Paper Co., Tonawanda, N. Y., on Goose Island, operated for some time past by the Beaverboard Co., Buffalo, will revert to the original ownership, and in the future will be run under the company name first noted. It has been reorganized and is now headed by Maurice W. Simon, Buffalo. Improvements will be made in the works.

The Jewett & Co., Stove Works, Military Road, Buffalo, has tentative plans for rebuilding the portion of its works destroyed by fire Aug. 10, with loss reported at $200,000, including equipment and stock. Two of the five buildings were destroyed; the other three structures, comprising pattern shop, foundry and office, were not affected and will continue in operation.

W. J. Henry, 128 South Street Auburn, N. Y., is organizing a company to construct and operate a new plant on York Street, to manufacture tools and other mechanical equipment. It will cost in excess of $75,000, with machinery.

The Massey-Harris Harvester Co., Inc., Batavia, N. Y., manufacturer of farm implements, has tentative plans for enlargements at Toronto, Ont. It is proposed to place the works in operation early in September, advancing production to a working force of about 1500 men as soon thereafter as possible. The Brantford, Ont., plant will also be placed in service, with a working force of approximately 800 operatives.

The Sill Stove Works, Inc., 524 Oak Street, Rochester, is planning for the erection of a one-story addition to its plant. A portion of the structure will be used for casting cleaning operations.

The Rochester Telephone Corporation, 59 Stone Street, Rochester, has plans under way for a new two-story service and repair building on St. Paul Street, to include a parts and machining department, cabinet shop, as well as a service shop for company cars and trucks. It will cost about $125,000. J. F. Warner, company address, is architect.

The Batavia Car Works, Inc., Batavia, N. Y., recently organized with a paid-in capital of $350,000, is arranging for the immediate operation of its new plant on Clinton Street, to be devoted for the present to railroad car repair work. Contract has been made with the Erie Railroad for the repair of about 3000 cars, to be delivered in allotments of about 50 at the plant. John G. Baukat is president, and Edward P. Pattison, Mount Morris, N. Y., vice-president and treasurer. The directors include Theodore H. Wickwire, president Wickwire Steel Co.; Ralph Plumb, vice-president Buffalo Bolt Co.; and R. H. Griffith, president Buffalo Car Wheel Foundry Co., all of Buffalo.

The Binghamton Light, Heat & Power Co., Binghamton, N. Y., has tentative plans under consideration for a power house at the Rockbottom Dam property, recently acquired, to be operated in conjunction with its other plants. It is converting its former Court Street plant into a service and repair department for company cars and trucks, and will use a portion of the structure for a storehouse.

New England

BOSTON, Aug. 21.

ALTHOUGH not active, the machine tool market in this district displayed more life the past week than at any time this month. Sentiment among the trade in general has improved as a result and indications point to enough additional business being booked to bring August sales to a much higher level than anticipated early in the month. Business closed the past week includes a sale of 20 tools, comprising one 36-in., one 18-in., one 12-in. lathe, planer and miscellaneous shop equipment to a Massachusetts textile interest, which is the largest individual order placed in this section this month; a large gear hobber to a Massachusetts manufacturer of electrical appliances; a fairly large punch and shear to a New London, Conn., interest; a New England made coach wheel lathe to the Boston & Maine Railroad; miscellaneous metal-working equipment to the city of Boston for its Hyde Park and Thompson schools, and a 14-in. sensitive drill as well as a used 12-in. x 6-ft. lathe to the Normal School, Fitchburg, Mass.

A Middle West maker of shapers has advanced prices 20 per cent, while the Peerless Machine Co., Racine, Wis., has advanced one size of metal sawing machines $10 and its shaping saw $20. Other machine tool builders, although not actually putting up prices, have tightened on discounts, which virtually amounts to an advance.

Several inquiries for new tools developed last week, mostly for single machines. The most important is a list of five or six tools, including a milling machine, grinding machine and presses wanted by a Providence, R. I., concern, and an inquiry from the General Electric Co., Lynn, Mass., for a horizontal boring machine of a more or less special design. Local representatives of machine tool builders report a strong possibility of business under consideration for some time being closed before Labor Day.

Sales of used equipment have been few and far between. There is, however, more interest shown in this class of equipment. Most inquiries concern single machines and customers are given to shopping in the hope of picking up bargains. A Springfield concern wants five used W & S screw machines and reports the supply extremely limited. A Naugatuck Valley, Conn., foundry is in the market for two 10 in. vertical boring machines.

The demand for small tools has increased. Some local machine tool houses report sales for the first half of August equal to or better than the aggregate for July. Last month, it will be recalled, was a profitable one in small tools.

The crane market is slightly more active. The Turner Center System, Providence, has purchased a hand crane with an electric hoist, and two other crane jobs are reported as

being on the point of closing. The Vermont Marble Co., Proctor, Vt., is inquiring for a 25-ton crane with a 70 ft. span.

The auction sale of the equipment of the Ross Machine Co., Wollaston, Quincy, Mass., held last week was largely attended, but mostly by dealers. A majority of the tools went at very reasonable prices and at about one-half the appraised value.

Fire last week destroyed No. 1 mill of the Wickwire-Spencer Steel Corporation, Spencer, Mass. It was used for fine wire drawing. About 40 operators were employed. Damage is estimated at about $20,000.

Plans will be ready next month for a four-story and basement packing plant, costing about $300,000, to be erected by the Confederate Home Abattoir Co. The Gorman & Brown Engineering Co., 357 Westminster Street, Providence, is the engineer.

The plant of the Westfield Machine Co., Westfield, Mass., was considerably damaged by fire last week. It will rebuild as quickly as possible. A large amount of radio work is on its books.

The Wico Electric Co., West Springfield, Mass., plans the erection this fall of four monitor type, 90 x 400 ft. manufacturing units, the first to be ready for operation Jan. 1. Phelps Brown, 44 Avon Place, Springfield, is president; Arthur W. Lamson, vice-president and works manager, and E. L. Stoughton, treasurer and sales manager.

The Automatic Refrigerating Co., 618 Capitol Avenue, Hartford, Conn., will erect an addition to cost $50,000.

The Quidnick-Windham Mfg. Co., Willimantic, Conn., is planning for extensions and improvements in the power plant at its cotton mill, to include a new 300-hp. water wheel, head gate and other equipment.

The Homer D. Bronson Co., Beacon Falls, Conn., manufacturer of metal stampings, hardware products, etc., has awarded contract to the Oscar La Croix Construction Co., Waterbury, Conn., for a two-story addition.

The H. L. Judd Co., Wallingford, Conn., operating a plant for the manufacture of brass furniture and other brass products, has filed articles of incorporation under Delaware laws with capital of $5,400,000 for proposed expansion.

The Tide Water Oil Co., 60 Cambridge Street, Allston, Mass., will commence the erection of a one and two-story oil distributing and storage plant on Dorchester Avenue, Dorchester, Mass., to cost about $75,000, including equipment.

Fire, Aug. 16, destroyed a portion of the plant of the Danbury Metal Ball, Danbury, Conn., with loss estimated at $40,000, including equipment.

The Bay State Tap & Die Co., Mansfield, Mass., has acquired the plant of the Blancke Twist Drill Co., Taunton, Mass., bankrupt, for a branch plant. It is expected to commence operations early in September.

The Safety Car Heating & Lighting Co., Hamden, Conn., has filed plans for two additions, each one-story, 106 x 115 ft., and 56 x 195 ft., estimated to cost about $40,000 and $50,000, respectively. The last noted structure will be equipped to manufacture battery plates and similar apparatus. Stovel & Brinkerhoff, 136 Liberty Street, New York, are engineers and contractors.

The New Bedford Boiler & Machine Co., 42 Front Street, New Bedford, Mass., will erect a new three-story building at Water and Commercial streets, 60 x 165 ft., estimated to cost close to $75,000.

The Portland Terminal Co., Portland, Me., is said to be considering plans for rebuilding the portion of its locomotive repair shops, destroyed by fire Aug. 13, with loss of about $1,000,000, including a number of locomotives of the Maine Central and Boston & Maine railroads. The structures destroyed included engine house, machine repair shop, air brake shop, fuel oil plant and other departments.

Druker & Rudbick, Brighton, Mass., will build a one-story automobile service and repair building at 125-31 Harvard Avenue, estimated to cost $75,000. Plans have been drawn.

The H. N. Blanchard Electrical Co., Inc., Portland, Me., recently organized with a capital of $50,000 to manufacture electrical equipment and supplies, has acquired a building at 25-27 Casco Street for its plant. Operations will begin at once. Harry N. Blanchard, formerly connected with the Hay-Blanchard Electric Co., Portland, is president.

The Penobscot Power Co., Medway, Me., recently organized, is perfecting plans for a hydroelectric generating plant on the Penobscot River, in the Rockabemis Rips section, Medway. The company will issue capital stock for $300,000 and bonds for $600,000 to provide for the erection. A transmission system will be constructed from Medway to Howland and Enfield.

The Gilbert & Bennett Mfg. Co., Georgetown, Conn., manufacturer of wire cloth, etc., will commence the erection of a three-story addition to its plant a Wilton, Conn., 50 x 130 ft., estimated to cost about $75,000. Greenwood & Noerr, 847 Main Street, Hartford, Conn., are architects.

Chicago

CHICAGO, Aug. 21

THERE is no doubt that the coal and railroad strikes continue to restrict new buying, notwithstanding the partical settlement of the former. The machine tool trade, however, is keeping up its spirits, as it believes that business will improve as soon as the present uncertainty regarding transportation and fuel has disappeared. In the meantime, no action is being taken on the railroad lists and outside of a few additional purchases by the Continental Motors Co. and the Studebaker Corporation, little buying is being done by industrials.

Rising costs, due in part to a scarcity of fuel and labor shortage, are causing much concern among machine tool manufacturers, and general advances in the near future are regarded as inevitable. A few price changes have already been made. The Warner & Swasey Co., manufacturer of turret lathes, Cleveland, which announced revised prices on some of its smaller machines July 1, has adjusted prices on some of its larger sizes and semi-special machines, the advances ranging from less than 5 up to 20 per cent. By Sept. 1 this company expects to complete an entire revision of its prices. The Peerless Machine Co., Racine, Wis., has advanced hack saws approximately 6 per cent.

The Wisconsin Steel Works has awarded five 7½-ton spout hoist jib cranes to the Whiting Corporation for its new open hearth plant at South Chicago. These are in addition to the cranes let to the Alliance Machine Co., as reported in THE IRON AGE of Aug. 17.

The Byllesby Engineering & Management Corporation, Chicago, has placed an order for a 65-ton 4-motor electric traveling crane with the Whiting Corporation for the Western States Power Co. at Placerville, Cal.

Bliss & Laughlin, Inc., Harvey, Ill., has ordered a 5-ton electric traveling crane from the Whiting Corporation. A number of traveling cranes, as well as considerable foundry equipment, will be purchased for a large foundry now being constructed for the Pullman Co., Pullman, Ill.

Fred H. Schanze, 1443 Roosevelt Road, Chicago, has let a contract for a one-story automobile repair shop, 48 x 82 ft., at 1443-45 West Roosevelt Road, to cost $7,500.

The McDonald Loose Leaf Co., 638 Federal Street, Chicago, has let contract for a one-story factory, 95 x 125 ft., at 1809-17 Summerdale Avenue, to cost $30,000.

Lawder Brothers, 6916 LaFayette Avenue, Chicago, have let contract for a one-story garage and service station, 125 x 164 ft., at 5229-5305 Lawrence Avenue, to cost $27,500.

The Damascus Crucible Steel Casting Co., New Brighton, Pa., will soon start the construction af a plant on Summer Street, Hammond, Ind., opposite the works of the Metals Refining Co.

The Victor Auto Body Co. has leased for three years the property at 1638-40 South Wabash Avenue, Chicago, and will manufacture a special sport model for automobiles.

Fire recently damaged the plant of the Novelty Iron Works, Sterling, Ill., to the extent of from $5,000 to $8,000. Reconstruction work has been started.

The Hartford Foundry, Hartford City, Ind., is completing improvements and enlargements totaling $15,000.

The Rich Steel Products Co., Battle Creek, Mich., plans to erect a four-story factory to cost $500,000. Construction will probably not be undertaken until next year.

The Payne Motor Co., 1301 Hennepin Avenue, Minneapolis, Minn., has let contract for a three-story garage and sales building, 100 x 150 ft., at Fourteenth Street and Harmon Place, to cost $117,000.

The Dayton Co., Seventh Street and Nicollet Avenue, Minneapolis, Minn., has awarded contract for a two-story

garage, 100 x 143 ft., at Eleventh Street and First Avenue, to cost $60,000.

The Ruggles Truck Co., Bad Axe., Mich., has let contract for a factory, 80 x 160 ft., to build truck bodies. The building with equipment will cost $30,000.

The Brown-Sebco Terminal Mfg. Co., 5616 Harper Avenue, Chicago, recently incorporated with $25,000 capital stock, will manufacture the Sebco battery post terminal clamp for use in connection with the storage battery on an automobile. It also has other products under consideration which will be soon put on the market. A plant has been leased at the address given. The only equipment for which the company is now in the market is an electro-lead plating apparatus. The officers are Max Brown, president; J. D. Cameron, treasurer; A. M. Brown, vice-president and secretary.

The Carlin Foundry Corporation is being formed by George E. Carlin, Alex A. Stewart and John Friese to purchase the plant of the Northern Foundry Co., La Porte, Ind. The new company will make light gray iron castings for the jobbing trade. The foundry is well equipped and will probably start operations about Sept. 1.

The City Council, Oskaloosa, Iowa, has plans under way for the initial unit of its new hydroelectric generating plant on the Des Moines River, near Harvey, Iowa, estimated to cost about $270,000, and will call for bids after the first of the year. The Fargo Engineering Co., Jackson, Mich., is engineer.

Freight-handling and conveying, and other mechanical equipment will be installed in the new freight terminal to be constructed by the McDougall Terminal Warehouse Co., Duluth, Minn., estimated to cost about $1,750,000. The work will include a power plant, with ice-manufacturing and refrigerating plant adjoining. A. Miller McDougall is president.

Arthur Berner, Rosemount, Minn., will take bids at once for a one-story automobile service and repair building, 52 x 110 ft., with machine shop. A. L. Garlough, 882 Cherokee Avenue, St. Paul, Minn., is architect.

A complete machine shop for automobile parts manufacture and repair work will be established in connection with the new building of the Johnson Automotive Trade School, Denver, Col., for which work will be placed under way at once. It will cost about $100,000.

The Payne Motor Co., 1301 Hennepin Avenue, Minneapolis, will commence the erection of a three-story automobile service and repair works, 100 x 150 ft., at Harmon Place and Fourteenth Street, estimated to cost close to $120,000.

A vocational department will be installed in the the two-story and basement high school, 90 x 172 ft., to be erected at Argo, Ill., estimated to cost about $125,000, for which work is under way. Ashby, Ashby & Schultz, 1511 West Jackson Boulevard, Chicago, are architects.

The Tilden Produce Co., 65 East Third Street, St. Paul, Minn., is planning for the installation of additional equipment at its ice and refrigerating plant. W. A. Tilden is president.

The People's Auto Co., Red Lake Falls, Minn., is planning to rebuild its service and repair works, recently destroyed by fire. The new shop will be 50 x 110 ft. John Helm is general manager.

The Commonwealth Edison Co., 72 West Adams Street, Chicago, will soon take bids for two one-story power houses, 78 x 100 ft., and 35 x 75 ft., respectively, at 707-15 South La Salle Street, and 19 East Twenty-first Street.

The Illinois Traction System, 200 Peoria Life Building, Peoria, Ill., will build a one-story addition to its power house at La Salle, Ill., estimated to cost close to $50,000.

Detroit

DETROIT, Aug. 21.

THE Jennison Hardware Co., 901 North Water Street, Bay City, Mich., will commence the erection of a new plant at Second and Water streets, consisting of three one-story units, 100 x 250 ft., 60 x 200 ft. and 40 x 200 ft. respectively, estimated to cost about $400,000. H. W. Jennison is president.

A vocational department will be installed in the proposed high school to be erected at Almont, Mich., for which bonds for $90,000 have been voted.

The Maxwell Motor Corporation, Oakland Street, Detroit, is concluding negotiations for the acquisition of the entire property of the Chalmers Motor Co., Detroit, including the East Jefferson Street plant, equipment, manufacturing rights, etc.

The Republic Glass Co., Monroe, Mich., will commence the erection of a new one-story plant, 200 x 400 ft., on Kentucky Avenue, estimated to cost close to $50,000.

A vocational department will be installed in the new high school to be erected at Lapeer, Mich., estimated to cost $200,000, for which a site is now being selected. R. A. LeRoy, Pratt Building, Kalamazoo, Mich., is architect.

The Saxon Motor Car Corporation, Beaufait Street, Detroit, has arranged for a stock issue of $1,000,000, to net about $750,000, a portion of the proceeds to be used for extensions and improvements, and general expansion.

The Liberty Tractor Corporation, 535 Griswold Street, Detroit, is completing plans for the first unit of its new plant in the Lincoln Park section, one-story, 60 x 160 ft., and will commence construction early in the fall. Other units will be erected later.

The Grand Rapids Tire & Rubber Co., Grand Rapids, Mich., is planning the erection of a new unit to manufacture cord tires, estimated to cost about $250,000, including machinery. L. A. Brown is president and general manager.

A vocational department will be installed in the new two-story high school, 75 x 196 ft., to be erected at Bellevue, Mich., estimated to cost about $90,000, for which new bids will soon be asked. C. S. Patterson, Hauselman Building, Kalamazoo, Mich., is architect.

L. N. Bates, Sixteenth Street and Grand River Avenue, Detroit, is taking bids for a one-story automobile service and repair building, 65 x 100 ft., at Mackinaw Street and Grand River Avenue, estimated to cost close to $50,000. A. M. Hull, Room 1205, Detroit Savings Bank Building, is architect.

A vocational department will be installed in the new two-story high school, 130 x 160 ft., to be erected at St. Johns, Mich., estimated to cost $175,000, for which bids will be asked in September. R. A. LeRoy, Pratt Building, Kalamazoo, Mich., is architect.

The Holley Carburetor Co., Vancouver Avenue and the Pere Marquette Railroad, Detroit, has awarded contract to Culvertson & Kelly, 872 West Milwaukee Avenue, for a one-story addition, 120 x 195 ft.

The Wolverine Metal Specialty Co., Grand Rapids, Mich., is planning for the installation of new machine shop equipment.

Cleveland

CLEVELAND, Aug. 21.

BUSINESS with local machinery houses is holding up at about its recent volume, orders being mostly for single and in some cases for two machines. The Youngstown Board of Education has purchased six 11-in. engine lathes from a Cleveland dealer, completing the equipment required for the Reyan school.

A local manufacturer of automatic machinery reports a fairly good volume of inquiries from the Pacific Coast. This company continues to take a few orders for one or two machines. There is still some demand from the Detroit automotive industry and two automobile companies in that city are expected to be in the market shortly for considerable equipment.

The Lima Locomotive Works, Lima, Ohio, has come into the market for 25 or more machines, nearly all heavy tools, for equipping its plant extensions. Several inquiries have been sent to dealers and manufacturers covering different lines of equipment required, but it is stated that the company has not yet fully decided on all the machinery it will purchase. It is understood that its requirements will amount to approximately $500,000. Orders have been placed for eight or ten electric traveling cranes with the Shaw Electric Crane Co. Its tentative machinery list includes the following:

One 20-in. x 10-ft. axle lathe.
One 36-in. vertical boring mill.
Two 42-in. vertical boring mills.
One 90-in. vertical boring mill.
Eight or 10 6-ft. radial drilling machines.
Three 60-in. to 90-in. planers.
Four geared head 20-in. engine lathes.
Two slotters.
Two turret lathes for brass working.

The Milwaukee Electric Crane Mfg. Co., has taken an order for an electric traveling crane with an 80-ft. span and a 3-cu. yd. bucket for the Sandusky Cement Co., Cleveland.

D. Round & Son, Cleveland, manufacturers of chain

hoists, have placed contract for a one-story foundry addition, 50 x 300 ft. It will be used largely for the manufacture of automobile pistons for the Dall Motor Parts Co., Vermillion, Ohio. The firm has also purchased an interest in the Dall business, which will be moved to one of the buildings of the Round plant. No new equipment will be required for the foundry extension.

The National Pressed Gear Co., Canton, Ohio, recently incorporated with a capital stock of $100,000, will establish a plant for the manufacture of pressed gears, largely for the automotive and allied industries. The company has effected its organization by the election of A. L. Lewis, president and sales manager; Harry W. McQuaid, vice-president and chief engineer; Ernest Strong, vice-president and superintendent; Frank L. DeCorps, treasurer, and Harry Nesbaum, secretary.

The Crucible Steel Castings Co., Cleveland, has placed contract for a steel foundry, 102 x 240 ft., at Almira Avenue, Southwest, and West Eight-fourth Street. The George S. Rider Co. is the engineer and architect.

The Yeiser Co., Cleveland, has placed contract for a new plant, 24 x 84 ft., at 1183 Holmden Avenue, Southwest, for the manufacture of plumbers brass goods. The company will purchase additional screw machine equipment.

The National Razor Mfg. Co., Lisbon, Ohio, is planning the erection of a machine shop. Die-making and other equipment will be installed.

The O-B Co., Lima, Ohio, has been incorporated with a capital stock of $100,000 to manufacture kerosene oil burners for domestic purposes. W. H. Nangester, 528 Market Street, and others are interested.

O. H. Sebring, Sebring, Ohio, has commenced the erection of a plant to manufacture aluminum kitchen ware. It will be 100 x 312 ft.

Frank A. and C. L. Sebring plan the erection of a nine kiln pottery plant at Alliance, Ohio, involving an expenditure estimated at $500,000. The building will be 176 x 700 ft.

Pittsburgh

PITTSBURGH, Aug. 21.

PRICE advances in machine tools have been fairly numerous in the past week. Some manufacturers of milling machines, shapers, and turret lathes quite generally have named higher prices, the advance amounting to about 10 per cent in the three lines. Although business is considerably less in volume than it was in June or in the fore part of July, sales of individual tools reach a fairly satisfactory aggregate and much prospective business is in sight. The trade is hopeful that larger sales are immediately ahead, now that the coal and railroad strikes give promise of an early termination.

Individual sales of drill presses have been greater in volume the past week, one dealer alone recording a sale of two 20-in., one 25-in. and one 14-in. presses. The Titusville Forge Co., Titusville, Pa., recently bought four 26-in. lathes, and a sale is noted in this district of a 24-in. lathe on a 14-ft. bed. The Struthers-Wells Co., Warren, Ohio, is in the market for a 6-ft. boring mill and the Pittsburgh & Lake Erie Railroad is taking bids on three combination truing machines. The Lima Corporation, Lima, Ohio, still is doing preliminary work on a number of tools wanted in connection with its plant enlargement. The Dravo Contracting Co., Pittsburgh, is another prospective tool purchaser, and the Center Foundry & Machine Co., Wheeling, W. Va., which is building a new plant at Warwood, W. Va., is in the market for a few tools, although it will remove all the equipment from its old plant in Wheeling to the new one.

The crane market has not shown much life. The Standard Steel Spring Co., Coraopolis, Pa., has placed the order for a 10-ton, 65-ft. span double hook crane with the Pittsburgh Crane & Equipment Co., and the Westinghouse Electric & Mfg. Co. has ordered a 10-ton, 59-ft. span, yard magnet crane from the Cleveland Crane & Engineering Co. The Pennsylvania Railroad, central region, has put out an inquiry for a 5-ton hand-power crane. Inquiries are not very numerous and pending business is inactive.

The National Transit Pump & Machine Co., Oil City, Pa., has plans under way for a new one-story foundry, 80 x 200 ft.

The Buick Motor Co., Baum Boulevard, Pittsburgh, has leased a four-story building to be erected at Baum Boulevard and Rebecca Street, estimated to cost $175,000, for the establishment of a service and repair works.

The War Department, Washington, has leased property at Hoboken, Pa., from the Aero Club of Pittsburgh, and will soon commence the erection of two hangars, with shop and repair facilities, for the establishment of a flying field. Lieut. R. B. Lea, Ninety-ninth Division, United States Army, is in charge.

The Universal Machine & Mfg. Co., 407 Rebecca Avenue, Wilkinsburg, Pa., is planning the installation of a drill press and other equipment at its works. G. P. Rhodes is head.

The Pittsburgh Typewriter & Supply Co., 39 Thirty-fifth Avenue, Pittsburgh, is in the market to contract with a metal-working shop for the manufacture of small parts used for typewriters and duplicating machines, including key levers, soft metal rivets, binder screws, rods, nuts, grease cups, etc.

The Board of Directors, Duquesne University, Bluff Street, Pittsburgh, will build a new power house. A. F. Link, 407 North Craig Street, is architect.

The McGraw Co., Bellaire, Ohio, agency for the Ford Motor Co., has plans nearing completion for a new two-story service and repair building at 2011 Main Street, Wheeling, W. Va., 85 x 125 ft., estimated to cost about $45,000.

The West Virginia & Maryland Power Co., a subsidiary of the West Penn Power Co., Pittsburgh, has acquired the plant and property of the Home Light Co., Terra Alta, W. Va., and will make improvements and extensions in this district.

The Robinson Coal Co., Gypsy, W. Va., has tentative plans for rebuilding the portion of its coal tipple recently destroyed by fire, with loss estimated at $22,000, including machinery.

The Fairmont-Chicago Coal Co., Fairmont, W. Va., recently organized to take over the local plant and properties of the Chesapeake Coal Co., for $1,000,000, has plans under way for the installation of additional machinery, including motors, hoisting equipment, mine cars, etc. E. F. Hartley is president, and W. E. Watson, general manager. The company is capitalized at $600,000.

A vocational department will be installed in the new two-story and basement high school, 115 x 180 ft., to be erected at Charleroi, Pa., estimated to cost about $150,000, for which J. C. Branton, Charleroi, is architect.

The Pittsburgh Engineering Works, Union Building, Pittsburgh, has leased space in the building at Duquesne Way and Garrison Alley for a local plant.

The Damascus Crucible Steel Castings Co., New Brighton, Pa., has acquired a tract of land along the line of the Nickel Plate Railroad, Hammond, Ind., for a new plant. Work will be placed under way at an early date.

The Board of Education, Patton, Pa., is said to be arranging a list of equipment for installation in the vocational department at its new high school. F. L. Brown is secretary.

The Pittsburgh & West Virginia Gas Co., Clarksburg, W. Va., has acquired property in the Montpelier section, for the erection of new repair shops, automobile service building and warehouse.

The Mutual Coal Co., Maidsville, W. Va., is planning to rebuild the portion of its tipple destroyed by fire Aug. 7.

The West Virginia Glass Mfg. Co., Huntington, W. Va., will install additional equipment at its plant. B. G. Landau is general manager.

Allison S. Fleming, Fairmont, W. Va., will soon commence the erection of a new three-story automobile service and repair building.

Cincinnati

CINCINNATI, Aug. 21.

THE machinery market, generally, is quiet, although engine lathe manufacturers report a fair volume of orders from widely scattered points. While inquiries continue, a very small percentage are being turned into orders, although it is conceded that with a settlement of the coal and rail strikes much of the business now under negotiation will be booked. The Louisville & Nashville Railroad has decided to defer purchases and has notified manufacturers to this effect. When the strike situation improves, however, its list of tools will be bought, as the equipment will be needed in various shops for replacement. Many prospective buyers who have withdrawn inquiries are asking to be notified previous to price advances, as they desire to take advantage of present quotations. A local manufacturer is in receipt of an inquiry from a large automobile manufacturer for a number of

special machines. The J. A. Fay & Egan Co., which will shortly call for bids on its new plant at Cincinnati, is expected to issue an extensive list of equipment. This company recently placed an order for nine cranes and a number of hoists for the new plant.

Local manufacturers report a scarcity of skilled help, most of the machinists out of work having accepted positions with railroad companies where much overtime work is being done.

The Marion F. Stout Co., Covington, Ky., has been incorporated with a capitalization of $175,000. It had been operating as a partnership and manufactures concrete blocks and tile. Plans are being prepared for additions and equipment to take care of increasing business. Marion F. Stout is president.

The Thomas & Armstrong Co., sheet metal manufacturer, London, Ohio, has increased its capitalization to $1,000,000 and plans additions to its works, including the equipment of a galvanizing plant and a manufacturing building. In addition to its present lines, the company recently embarked on the manufacture of steel shelving and will shortly engage in the manufacture of formed sheet metal products, such as roofing, siding, eaves trough, etc.

The plant of the Master Tire & Rubber Co., Dayton, Ohio, has been acquired at receiver's sale by the Universal Securities Co., for $75,000. Charles W. Hoffritz, president Securities Co., will reorganize the company to manufacture a complete line of automobile tires.

The Crawford, McGregor & Canby Co., Dayton, Ohio, manufacturer of golfing equipment, will build an extension to its plant, the contract for which has been placed with Frank Hill Smith, Inc.

Milwaukee

MILWAUKEE, Aug. 21.

MANUFACTURERS of agricultural machinery, particularly power farm operating equipment, are becoming more of a factor of demand for machine-tools, and while their requirements as yet are meager, inquiries indicate that a moderate volume of new business may be expected in the next few months. Automotive industries continue to buy one or two tools at a time to fill pressing needs, but otherwise the market remains spotty. The strike situation still handicaps industries and in addition has a restrictive effect upon plans of various metal-working industries because of uncertainties with respect to the immediate future.

The Kissel Motor Car Co., Hartford, Wis., has started preliminary work on a new power plant construction and equipment project involving an estimated investment of $100,000. The work is in charge of Cahill & Douglas, consulting engineers, 216 West Water Street, Milwaukee. A new boiler house, 40 x 80 ft., and 40 ft. high, will be erected first. This will be equipped with three 300-hp. Sterling boilers with automatic stokers, coal and ash handling and conveying machinery. A 175-ft. brick stack, with an 8-ft. flue, will be erected. The present power house will be enlarged and additional generating equipment installed, as soon as the increased boiler capacity is available. The Kissel company also will build a new battery of dry kilns and lumber curing rooms. W. L. Kissel is president.

The Roddis Lumber & Veneer Co., Marshfield, Wis., is taking figures on a 40-ft. chain or belt type of bucket conveyor and other equipment additions and extensions. Cahill & Douglas, Milwaukee, are consulting engineers.

The Russell Co., Kenosha, Wis., has been organized by A. M. Russell, formerly a sales executive of the Packard and Locomobile automobile companies, to manufacture gas motor coaches for passenger service on steam railroads. For the present manufacturing will be done under contract with the Russell Co. by the Winther Motors Co. of Kenosha, which already has built several coaches for demonstration purposes. The Russell Co. has orders valued at more than $1,000,000 for coaches from various railroads, including the Maryland & Pennsylvania of Baltimore, the New York, New Haven & Hartford, and others.

The La Crosse Motors Equipment Co., LaCrosse, Wis., has been organized by Jerome H. Chopiska, Frank Chopiska and J. V. Nigro to manufacture patented piston rings and other gas engine and general automotive machined specialties. A machine shop at 227-229 North Third Street has been leased and equipped. Initial operations are limited to piston ring manufacture. The partners formerly were associated with the Chopa Piston Ring Co., Auburn, Ind.

The Acme Tool Co., West Allis, Wis., has been incorporated with a capitalization consisting of 600 shares of common stock having no par value. It will lease or buy an existing shop building and install machinery for manufacturing tools, jigs and fixtures, and is authorized also to manufacture machinery, instruments, etc. The principals are J. F. Schnaufer, George Hoffman and Peter H. Mayes.

The Northwest Engineering Works, Green Bay, Wis., manufacturing a crawler type of locomotive crane, is preparing to engage in quantity production of gasoline-driven excavators, as distinguished from the so-called steam shovel.

The Winnebago County Board of Supervisors, Oshkosh, Wis., is asking bids until Aug. 23 for a one-story brick and steel garage and service shop, 68 x 120 ft., for highway construction and maintenance equipment. Inquiry is also being made for new and used tools. Otto Labbs is in charge.

The Rhinelander Refrigerator Co., Rhinelander, Wis., contemplates the erection of a factory addition for production of porcelain stock and parts used in the manufacture of iceboxes and refrigerators. An investment of $50,000 is planned. R. H. Reik is general manager.

The Twin Ports Marine Construction Co., Superior, Wis., which has been incorporated with $200,000 capital stock, has acquired the site and remaining buildings of the former Globe Shipbuilding Co., Superior, and will undertake some new construction as well as thorough re-equipment for the building and repair of steamships and other power craft. Chester A. Massey, associated with the Globe company, which during the war moved its plant and headquarters to the Atlantic seaboard, is president and general manager of the new corporation.

The Ft. Howard Paper Co., Green Bay, Wis., has engaged the Ludolf M. Hansen Co., local contractor, to design and construct a three-story mill addition, 100 x 120 ft., with a separate boiler house and power plant, at an estimated cost of $350,000, including equipment. A. E. Cofrin is general manager.

The D. J. Murray Mfg. Co., Wausau, Wis., founder, machinist and manufacturer of logging lumber manufacturing machinery, boilers, tanks, etc., has completed plans for a two-story brick and steel machine shop and assembly floor addition, 60 x 230 ft., and will soon be ready to purchase new equipment, including a 10-ton electric traveling crane. D. L. Bellinger is general manager.

The Scolding Locks Hairpin Co., Appleton, Wis., is purchasing miscellaneous wire-working, japanning and other equipment for its new factory, 40 x 200 ft., which will be ready about Sept. 10. Power plant and boiler equipment has been purchased.

The Madison Tool & Stamping Co., Madison, Wis., has orders on its books which will keep the plant busy for the next five months. It is contemplating the purchase of additional tools.

Baltimore

BALTIMORE, Aug. 21.

THE James Robertson Lead Works, 827 South Howard Street, Baltimore, has awarded contract to the Consolidated Engineering Co., Calvert Building, for a two-story addition, estimated to cost $65,000, for the manufacture of pipe and kindred specialties. Charles E. McPhail is general manager.

The Office of the Chief of Air Service, Washington, will take bids until Aug. 29 for vertical duplex fuel pumps, originally advertised to be opened on Aug. 18.

The Consolidated Gas, Electric Light & Power Co., Lexington Building, Baltimore, will make extensions at its plant at Westport, Md., to cost in excess of $300,000, including equipment.

The Atlantic Coast Line Railroad, Wilmington, N. C., is planning for extensions and improvements in its Southover shops at Savannah, Ga., to cost about $100,000. The work will include a new engine house, repair shop and considerable machinery.

The Board of Public School Commissioners, Charleston, S. C., will take bids on a general contract until Sept. 5, for the erection of a new vocational school on Chisholm Street. David B. Hyer, Peoples' Building, is architect.

The Pine Hall Brick Co., Pine Hall, N. C., recently organized with a capital of $100,000, has acquired the plant and property of the Dan River Brick Co. in this section. Extensions and improvements are planned, including the installation of additional equipment.

The W. T. Gray Co., 511 West Clay Street, Richmond, Va., operating an automobile service and repair works, is

planning for the installation of a lathe, drill press and other equipment.

The Reynolds-Lybrook Farm Co., R. F. D. No. 1, Winston-Salem, N. C., is planning the installation of an electric power house, with ice-manufacturing department, in connection with a new dairy plant. D. J. Lybrook is general manager.

The Travelers' Garage Corporation, Armory Building, Norfolk, Va., has awarded contract to Baker & Brinkley, Dickson Building, for a new one-story service and repair works, 120 x 160 ft., on Cove Street, estimated to cost close to $50,000. B. Gray Tunstall is head.

Electrical and mechanical equipment for converting mill operation from steam to electric power will be installed at once at the plants of the Hudson Cotton Mfg. Co., Hudson, N. C., and the Lenoir Cotton Mill, Lenoir, both operated under the same management.

The Gate City Motor Co., High Point, N. C., has acquired a site for a two-story service and repair building, 63 x 200 ft. Plans will be prepared at once.

The McDonald Brick Co., Ludowici, Ga., recently organized to take over the local plant of the Ludowici-Cedalon Co., manufacturer of tile, etc., is said to have preliminary plans under way for extensions and the installation of additional equipment.

A vocational department will be installed in the new high school to be erected at Lake City, S. C., for which plans will be prepared at an early date. The Board of School District Trustees is in charge.

The Carolina Machinery Co., Sumter, S. C., is planning for the purchase of a quantity of leather and rubber belting for transmission service. E. W. Moise is president.

The Office of the Public Printer, Government Printing Office, Washington, will receive bids until Aug. 31 for two motor-driven air compressors and one general service pump.

W. H. Chapman, 840 West Market Street, Greenboro, N. C., is planning the establishment of a factory to manufacture drain tile and kindred products. Inquiries are being made for machinery.

The City Commission, Frostburg, Md., will install new electric pumping machinery at the municipal waterworks in connection with improvements and extensions to cost about $60,000.

A. P. Gilbert, Durham, N. C., is making inquiries for a used double cylinder, double drop hoisting engine, with auxiliary equipment, in good condition.

The Purchasing Agent, Post Office Department, Washington, will receive bids until Aug. 28, for one two-wheel tire buffer, with stand, direct motor-driven.

The White Provision Co., Atlanta, Ga., will commence the immediate construction of a power house at its plant. It has preliminary plans under way for a new unit to comprise, in part, a five-story ice and cold storage plant. W. H. White, Jr., is president.

The Central South

ST. LOUIS, Aug. 21.

THE Muskogee Gas & Electric Co., Muskogee, Okla., will soon commence the construction of a new hydroelectric generating plant on the Arkansas River, with transmission system, estimated to cost about $1,000,000, including machinery. George Wilmarth is general manager.

The Indiahoma Refining Co., Federal Reserve Bank Building, St. Louis, with refineries at East St. Louis, Ill., and Okmulgee, Okla., is negotiating for the purchase of the plant of the Chickasaw Refining Co., Ardmore, Okla., which has been closed for more than a year. Upon acquisition, extensions will be made and new equipment installed. E. E. Schock is head of the purchasing company.

The Bradford Motor Works, Tulsa, Okla., is completing the construction of a local plant for the manufacture of oil well equipment, parts, etc.

Miller Brothers, Ponca City, Okla., operating the 101 Ranch Co., will commence the immediate erection of a new electric power plant to replace the one recently destroyed by fire.

George H. Siedhoff, Broadview Hotel, Wichita, Kan., will soon commence the erection of a four-story automobile service and repair building, estimated to cost close to $200,000, including equipment.

The Duncan Machinery Co., Dempster Building, Knoxville, Tenn., machinery dealer, has inquiries out for steel derricks for quarry service; also stiff leg derricks, with capacity from 5 to 10 tons, and for steam and electrically driven hoisting engines, with capacity from 5 to 10 tons.

The Missouri, Kansas & Texas Railroad Co., St. Louis, is planning the removal of its division repair shops from De Leon to Dublin, Tex, where increased facilities will be provided.

The Townley Metal & Hardware Co., Second and Main streets, Kansas City, Mo., has construction under way on a new one-story and basement addition, 50 x 100 ft.

The Walker Coal Co., Chelsea, Okla., is planning for the installation of electrical and other machinery on property recently acquired, including motors, hoisting equipment, mine cars, etc.

A one-story automobile service and repair building for company trucks and cars will be constructed by the Gray-Von Allmen Sanitary Milk Co., Louisville, estimated to cost close to $40,000. Frederick Arhart, Norton Building, is architect.

A vocational department will be installed in the new two-story and basement high school, 96 x 100 ft., to be erected at Highland, Kan., for which bids on revised plans will be called at an early date. C. W. Squires, Emporia, Kan., is architect.

The Mahan-Kerr Motor Co., Knoxville, Tenn., has plans under way for a three-story automobile service and repair building, 130 x 160 ft. Frank L. Kerr is general manager.

Electric motors, conveyors, traveling oven equipment and other mechanical apparatus will be installed at the plant of the Ward Baking Co., Kansas City, Mo., comprising the former plant of the Campbell Baking Co., recently acquired. The installation is estimated to cost about $100,000.

The Lester Carriage & Wagon Co., 115-19 South Fourteenth Street, St. Louis, is planning to rebuild the portion of its works recently destroyed by fire with loss of about $35,000.

A vocational department will be installed in the two-story and basement high school to be erected at Eighteenth and Freiticher streets, Owensboro, Ky., estimated to cost about $250,000, for which bids will be asked on a general contract in September. A. F. Hussander, 25 South Dearborn Street, Chicago, is architect.

The Calhoun Machinery Exchange, El Reno, Okla., machinery dealer, is making inquiries for a used pipe-bending machine to handle material up to 3 in. in diameter, in good condition.

The Fibre Mfg. Co., Room 612, New Orpheum Building, Wichita, Kan., is planning for the installation of new transmission equipment, including shafting, pulleys, belting, hangers, etc. C. T. Banon is head.

A. B. Cunningham, Poyen, Ark., is planning to rebuild his power house and saw mill, recently destroyed by fire.

The Sewanee Coal & Iron Co., Chattanooga, Tenn., will construct a steel coal tipple at its property in Sequatchie County, recently acquired. It is planned to install equipment in all departments to provide for a capacity of close to 5000 tons per day.

The Atlantic Ice & Coal Co., Chattanooga, Tenn., will soon commence the erection of a new ice and refrigerating plant. A site has been selected on McCallie Avenue.

A vocational department will be installed in the two-story high school to be erected at Belle, Mo., for which bids on a general contract will soon be taken. H. S. Bill, Miller Building, Columbia, Mo., is architect.

The Wichita Water Works Co., 211 North Market Street, Wichita, Kan., is planning for the installation of new electrically-operated pumping machinery. Extensions and improvements to cost $100,000 will be made.

The Stockton Roller Mills, Springfield, Mo., are planning for the rebuilding of their ice-manufacturing and power house, recently destroyed by fire.

The Gulf States

BIRMINGHAM, Aug. 21.

THE Otis Elevator Co., 419 South Akard Street, Dallas, Tex., has completed plans for a two-story building, 75 x 150 ft., at Young Street and Park Avenue for local headquarters, to cost close to $100,000. The present repair and machine shops at the South Akard Street works will be removed to the new location and extended. C. C. Perkins is local manager.

The Utilities Commission, Orlando, Fla., W. T. Bland, chairman, is taking bids until Aug. 30 for a municipal power plant and equipment. Alvord, Burdick & Howson, First National Bank Building, Orlando, are architects.

F. Kinsell, Dallas, Tex., will commence the immediate erection of a new one-story metal-working plant at Kate Street and Second Avenue.

The Alabama Dry Dock & Shipbuilding Co., Mobile, Ala., has acquired property on Pinto Island and plans the erection of a new shipyard. The present plant will be removed to the new location and extended.

Fire, Aug. 14, destroyed a portion of the car and locomotive repair shops of the Wichita Falls & Northwestern Railway Co., Wichita Falls, Tex., including engine house, machine repair shops, etc. An official estimate of loss has not as yet been made. It is planned to rebuild.

The Planters' Cotton Oil Co., Navasota, Tex., has preliminary plans under consideration for rebuilding the portion of its oil mill recently destroyed by fire with loss estimated at $50,000, including equipment. John D. Rogers is president.

Plans are under way for a reorganization of the New Orleans Light & Railway Co., New Orleans, recently purchased by a bondholders' committee for $14,500,000. Extensions will be made.

The San Juan Garage Co., Sanford, Fla., recently organized, will commence the erection of a one-story service and repair works, 85 x 100 ft., on site lately acquired. W. D. Rogers is president.

The Board of Education, Baton Rouge, La., is said to be arranging a list of equipment for installation in the vocational department of its new high school. R. C. Gordon is president of the board.

The New Orleans Compress Co., New Orleans, recently formed with a capital of $1,000,000 by officials of the Anderson-Clayton Co., New Orleans, raw cotton merchant, will build a large cotton compressing plant on local site.

The Seminole Canoe Club, Inc., Jacksonville, Fla., recently organized, is planning the establishment of a factory for the construction and repair of motor boats, canoes and other small craft. Louis E. Rothernal is head.

The Pennsylvania Sugar Co., Delaware and Shackmaxon streets, Philadelphia, has construction under way on a new sugar mill near Miami, Fla., with capacity of about 1000 tons of sugar cane per day. A power house will also be erected. George H. Earle, Jr., is president.

The Wisconsin-Alabama Lumber Co., Sylacauge, Ala., has plans under way for a new lumber mill estimated to cost in excess of $50,000, including equipment.

The Common Council, Brookhaven, Miss., will take bids until Sept. 5 for pumping machinery, motors, control apparatus and other mechanical equipment, in connection with extensions and improvements in the waterworks. The Kramer Engineering Co., Magnolia, Miss., is consulting engineer. F. A. Cameron is city clerk.

Freight-handling and conveying machinery, elevators, etc., will be installed in the new warehouse to be erected by the Dallas Terminal Warehouse Co., Dallas, Tex., estimated to cost about $250,000. Plans have been completed.

A vocational department will be installed in the two-story and basement high school to be erected at Hillsboro, Tex., estimated to cost about $125,000, for which foundations will commence at once. J. O. and T. J. Galbraith, Hillsboro, are architects.

An ice and cold storage plant will be installed in the new two-story building, 100 x 150 ft., to be erected by the Boren-Stewart Co., Dallas, Tex., wholesale grocer, estimated to cost $125,000.

A vocational department will be installed in the new high school, 60 x 105 ft., to be erected at Catchings, Miss., estimated to cost $160,000. Charles Deas, Goodwyn Institute, Memphis, Tenn., is architect.

The George C. Brown Lumber Co., Grenada, Miss., has plans under way for the construction of a new lumber and saw mill on its timber properties on the Yalabousha River.

The Groveland Novelty Works, Groveland, Tex., has plans nearing completion for a factory to manufacture wood and other specialties. Wood-working machinery, bench tools, oil-operated engine and other mechanical equipment will be installed. H. H. Prashun heads the company.

The Pacific Coast

SAN FRANCISCO, Aug. 15.

THE Hebern Electric Co., Oakland, Cal., has plans under way for a new three-story, reinforced-concrete plant on West Harrison Street, to manufacture electrical equipment and supplies, estimated to cost about $200,000, including equipment. Reed Corlett, Oakland Bank of Savings Building, are architects.

The Southern California Edison Co., Los Angeles, will build a new power house on Los Angeles Street, Inglewood, Cal., with capacity of about 7000 hp., estimated to cost approximately $60,000.

The Illinois Electric Co., Los Angeles, has awarded contract to the R. E. Millsap Co., Marsh-Strong Building, for a new four-story factory branch at North Boyd and San Pedro streets, estimated to cost about $80,000. Headquarters are at 314 West Madison Street, Chicago.

The Green Mill Amusement Park Co., Fresno, Cal., will build an ice-manufacturing and refrigerating plant in connection with its new skating rink. The entire project will cost in excess of $300,000. Ellery, Frost & Patten, 1913 Fresno Street, are engineers.

Tilden & Tilden, Santa Rosa, Cal., have leased a two-story, reinforced-concrete building, 75 x 150 ft., to be erected on B Street, estimated to cost $35,000, for the establishment of an automobile service and repair works, including machine shop.

The Automobile Assembling Co., Los Angeles, has awarded contract to the Austin Co., Pacific Electric Building, for a new one-story plant on Sixteenth Street, 165 x 200 ft., estimated to cost $55,000.

F. S. Webster, city clerk, Burbank, Cal., will take bids until Sept. 5, for a deep well centrifugal pump, with capacity of 1350 gal. per min.

The Board of Public Works, San Francisco, will receive bids until Sept. 6 for car bodies, trucks, motor equipment and air brake apparatus for the municipal railroad system.

Freight-handling and conveying machinery will be installed in the new three-story automobile warehouse to be erected at Sixth and Clarence streets, Los Angeles, by the Union Pacific Railroad Co., and occupied by the Sinclair & Bowman Co., 100 x 380 ft., estimated to cost about $75,000. The Union Pacific company is said to be planning the installation of a traveling crane at its new loading dock.

The Bear River Water & Power Co., care of J. L. Rollins, P. O. Box 22, Auburn, Cal., is planning the construction of a new hydroelectric power house in the Wilson Valley, Placer County.

A vocational department will be installed in the new high school to be erected at Oakland, Cal., estimated to cost about $700,000, for which bids on a general contract will be received until Sept. 11. C. W. Dickey, 2149 Broadway, is architect.

The Pacific Fruit Express Co., 65 Market Street, San Francisco, will soon commence the erection of a new ice plant at Nampa, Idaho, to cost $40,000.

The Chehalis Mill Co., Chehalis, Wash., has tentative plans under way for rebuilding its lumber mill, recently destroyed by fire with loss estimated at $300,000, including machinery.

The Marine Equipment Co., Aberdeen, Wash., will soon commence the erection of the first unit of a new plant on site between Aberdeen and Hoquiam, Wash., recently acquired, estimated to cost in excess of $200,000, including machinery.

Canada

TORONTO, Aug. 21

DURING the week a slight improvement was noted in the demand for machine tools. The present call, however, is from the smaller industries which are adapting plants to present requirements of the trade and are handling new lines of manufacture. Buying on a moderate scale continues from automobile concerns, but more activity is expected from this source within the next month or two. The demand for wood-working equipment is showing steady improvement and companies manufacturing this line are finding it necessary to increase their operations. Despite the fact that the shortage of coal is beginning to have a telling effect on various industries, announcements continue with regard to the construction of new plants and additions, with the result that dealers and manufacturers look forward to considerable demand for machinery and tools. Inquiries for practically all lines of equipment, both for domestic and export account, are improving. The call for machine shop supplies and small tools generally continues on an encouraging basis.

The Joliette Steel Products, Ltd., 211 McGill Street, Montreal, has been incorporated with a capital stock of $375,000 by Walter R. L. Shanks, Linton H. Ballantyne, Charles R. McKenzie and others as provisional directors. It has acquired the plant and equipment of the Joliette Steel Co., Joliette, Que., and will continue manufacturing the latter's line of equipment as well as new products. W. A. McCallum is vice-president.

The Hayes Wheel Co., Chatham, Ont., has recently

acquired the plant and equipment of the Dominion Forgings & Stampings, Ltd., Merritton, Ont.

E. W. Bassick, president, and Mr. Feasler, general manager Bassick Mfg. Co., Chicago, have completed negotiations and will take over the H. A. Wood plant on Pinnacle Street, Belleville, Ont., to manufacture Alemite products. The necessary machinery and equipment will be forwarded to Belleville and installed as soon as possible.

The plant of the Canadian Pipe Co., Vancouver, B. C., was destroyed by fire with a loss of $100,000. Although no definite announcement has been made, it is expected that it will be rebuilt without delay.

It is reported that the Dominion Glass Co., Montreal, will shortly undertake the construction of a local plant to cost approximately $1,000,000. At present the company is operating two smaller plants which will be abandoned when the new structure is ready. Besides the Montreal plants the company has works at Radcliffe, Alta., Hamilton, Toronto and Wallaceburg, Ont.

Work on the construction of an addition to the paper mills of the Belgian Industrial Co., Shawinigan Falls, Que., is underway. The building will be 112 x 265 ft., and is designed to contain two paper machine units, one of which has been ordered from Charles Walmsley & Co., Ltd., Bury, England. An electric crane operated by four motors and having a span of 82 ft. and a capacity of 30 tons, will also be installed, as well as a crane of the same capacity with a span of 30 ft. The company contemplates the completion of one unit by January and has under consideration the purchase of the second unit to be in operation by October, 1923.

The Libby-Owens Glass Co., Ltd., Kenilworth Avenue North, Hamilton, Ont., which completed the erection of a new plant a short time ago at a cost of approximately $2,000,000, is having plans prepared for an addition which when in operation will practically double the present capacity.

The Price Brothers Co., 56 St. Peter Street, Quebec, is preparing to erect two pulp mills at Kenogami, Que.

The Dominion Insulator Co., Niagara Falls, Ont., has started work on the erection of a plant to cost $150,000.

Indiana

INDIANAPOLIS, Aug. 21.

THE Duesenberg Co., South Harding Street, Indianapolis, manufacturer of automobile engines, etc., will commence the erection of an addition estimated to cost about $30,000.

The Chapman-Price Steel Co., Shelby Street, Indianapolis, will hold in abeyance the construction of its proposed addition estimated to cost about $500,000, including equipment. It is expected to commence work during 1923. Preliminary plans are being drawn.

The Terre Haute, Indianapolis & Eastern Traction Co., Indianapolis, has made application to the Public Service Commission for permission to enlarge its electric generating plant on West Tenth Street. A new 15,000-kw. generator and auxiliary equipment will be installed.

Following the completion of its new plant at Michigan City, Ind., for which excavations for a number of buildings are now under way, the Sullivan Machinery Co., 122 South Michigan Avenue, Chicago, manufacturer of mining machinery, air compressors, etc., will remove its Chicago works to this location, utilizing the equipment and later disposing of the buildings. A tract of 125 acres has been acquired for the new plant with buildings to include foundry, machine shop, assembling plant, etc., estimated to cost close to $1,000,000, including additional equipment to be installed. Office headquarters will be maintained at Chicago, as heretofore.

The Standard Oil Co., Indianapolis, will build a new distributing and storage plant at Fairmount, Ind., in the western part of the city.

R. W. Voorhees, Frankfort, Ind., has plans under way for a new one-story lumber plant, 45 x 140 ft., estimated to cost close to $40,000, including machinery.

Leslie Gee, 208 North Sixth Street, Vincennes, Ind., will erect a new automobile service and repair building at Lawrenceville, Ill., estimated to cost close to $30,000.

The Indiana Quarries Co., Bedford, Ind., has tentative plans for rebuilding its plant recently destroyed by fire. The new mill, with machinery and power equipment, is estimated to cost in excess of $350,000. Nelson Joynon is general superintendent in charge.

The Durant Motor Co. of Indiana, Muncie, is reported to be planning for enlargements in its local plant, devoted exclusively to the manufacture of six-cylinder automobiles, to include the installation of additional equipment. W. R. Willett is president.

IRON AND STEEL STOCKS

Better Demand and Higher Prices Noted the Past Week

Steel shares were in good demand and higher the past week, investment being attracted by developments in connection with plant consolidations and by advancing prices for mill products. United States Steel common shares sold at a new high level for 1922. The demand for industrial shares in general, however, has been more or less limited and comparatively little improvement in values is noted. The coal strike situation, although somewhat better, is by no means settled. Yet the fuel supply situation is improving, while the carriers are slowly but surely overcoming labor troubles. Textiles are in better demand, reflecting a larger retail buying power. Raw cotton is appreciating in value. Grain and livestock values, on the other hand, are declining and in turn will be reflected in industry. The cost of living continues to advance, which tends to check wage reductions.

The range of prices on active iron and industrial stocks from Monday of last week to Monday of this week was as follows:

Allis-Chalm.	52¾ - 55⅛	Lack. Steel	77 - 81½
Am. B. S. & F...	70½ - 72	Lima Loco.	52⅜ - 58½
Am. Can	56½ - 58⅞	Lima Loco. pf...	110¼ - 115
Am. Can pf.....	109½ - 109¾	Midvale Steel ..	34 - 36½
Am. Car & F...	171½ - 177	Nat.-Acme	16¼ - 16⅝
Am. Car & F. pf.	122½ - 125	Nat. E. & Stm..	56⅜ - 59¼
Am. Loco.	117½ - 120⅝	Nat. E. & S. pf. ...	- 94
Am. Loco. pf....	118¼ - 118¼	N. Y. Air Brake	74½ - 78
Am. Radiator ..	110½ - 115¾	Nova Scotia Steel	34½ - 34⅝
Am. Stl. Fdries.	40½ - 42	Otis Steel	11 - 11¾
Am. Stl. F. pf...	99½ - 100	Pressed Steel ...	80½ - 81¾
Bald. Loco.	121¾ - 126½	Pressed Steel pf ..	- 99¾
Bald. Loco. pf... ..	- 114	Ry. Steel Spring.	109 - 111
Beth. Steel	76½ - 78½	Replogle Steel ..	31¾ - 33½
Beth. Stl. Cl. B..	78 - 80	Republic	71½ - 74⅞
Brier Hill	17¾ - 18¾	Republic pf.....	92½ - 93½
Br. Em. Steel...	10⅞ - 11	Sloss	47 - 48
Br. E. Stl. 1st pf ..	- 72⅞	Sloss pf.....	- 75½
Br. E. Stl. 2d pf.	30½ - 33¾	Steel of Can.....	74½ - 77½
Cambria Steel... ..	- 90	Un. Alloy Steel..	37⅜ - 39
Chic. Pneu. Tool	66½ - 69⅝	U. S. Pipe.....	33 - 35⅛
Colo. Fuel	29½ - 32	U. S. Pipe pf....	- 72
Cruc. Steel	90¼ - 95	U. S. Steel.....	100½ - 104¼
Cruc. Steel pf...	93½ - 94	U. S. Steel pf...	119⅝ - 121¾
Gen. Elec. 178	-184	Vanadium Steel..	47¼ - 50⅜
Gt. No. Ore Cert.	39¾ - 42½	Va. I. C. & Coke	55¼ - 56
Gulf States Steel	81 - 84⅞	W'house Air Br.	94 - 95
Inland Steel	- 50¾	W'house E. & M.	61⅛ - 62¾
Int. Har. 112¼	-115⅞		

Industrial Finances

Assets of the defunct Barton Axle Co., Barton, Washington county, Wis., will be sold at public auction by the receiver, Henry J. Driessel, on Sept. 2 at 10 a. m. The court has fixed $80,000 as the minimum bid acceptable, and requires payment of $2,500 in cash at time of bid as a deposit. The property will be offered in parcels and as a whole. The shop is 100 x 200 ft., and was erected about two and a half years ago to manufacture automobile, motor truck and tractor axles.

The plan for the liquidation of the indebtedness of the Locomobile Co. of America, Bridgeport, Conn. is approved by half of the creditors and so far there have been no objections. The plan, if it becomes operative, should net creditors 17½ per cent in new bonds and 18½ per cent in cash.

During the first half of this year the American Can Co. did about 20 per cent more business than it did in the corresponding period last year. Earnings, however, were not at a rate to warrant expectations of a dividend on the common stock for some time.

The United Alloy Steel Corporation's operating profits for the six months ended with June were $1,913,113, and its total income $1,959,029. For interest and depreciation $684,106 was charged off, leaving a net income of $1,274,923, which after preferred dividends is equal to $1.45 a share on the 800,000 outstanding common shares, which have no par value.

The Transue & Williams Steel Forging Corporation showed a deficit in the first half of 1922 of about $116,000, after all charges. The company has been reported operating on a profitable basis, but necessary adjustments in inventory, etc., resulted in the showing made. At the close of June the company had about $100,000 cash on hand and Government securities of about $1,300,000.

The Saxon Motor Car Corporation, 3733 Beaufait Street, Detroit, has arranged for a stock issue of $750,000, a portion of the proceeds to be used for extensions and improvements.

The Supreme Motors Corporation, Warren, Ohio, has been placed in receivership as a result of a bankruptcy petition filed in the Federal Court, Cleveland. N. A. Wolcott, War-

ren attorney, was appointed receiver. The company was organized about three years ago and engaged in quantity production of automobile motors.

A revaluation of the plant and equipment of the Barney & Smith Car Co., Dayton, Ohio, preparatory to its being offered for sale by the receiver, has been completed. The reappraisal value was $2,273,708.87, or nearly one million dollars below the figures at which the property was appraised last April. When confirmation of the appraisal is made, the plant will be offered for sale by the sheriff of Montgomery Co.

The Metz Co., Waltham, Mass., automobiles, has been petitioned into bankruptcy by three creditors.

A group of bankers is offering a block of stock of the Timken Roller Bearing Co., Canton and Columbus, Ohio, maker of tapered roller bearings.

Upon the petition of the Allis-Chalmers Mfg. Co. and other creditors, Judge Lawrence W. Halsey of the Milwaukee County Circuit Court has appointed Julius J. Goetz receiver of the Milwaukee Shaper Co., 1020-1040 Chestnut Street, Milwaukee, manufacturer of shapers and other tools.

Appraisals of the properties of the defunct Molle Typewriter Co., Oshkosh, Wis., filed Aug. 14, show total assets of $179,431.04 represented by physical property, in addition to a nominal valuation of the patent rights at $450,000. Jigs, dies, etc., are valued at $82,500; finished goods on hand, $18,275, and materials, $38,292.94. Charles D. Breon is trustee.

F. Clyde Sullivan and William L. D'Olier, receivers for the United States & Cuban Allied Works Engineering Corporation, Bradford, Pa., will dispose of the plant and machinery of the company at a public sale, Oct. 2, including machine tools, bench tools, fixtures, etc.

Half Year of American Steel Foundries

As evidence of the turnabout in the steel and allied industries during the early part of this year, the report of the American Steel Foundries for the six months ended with June is a case in point. Net earnings for that period were $2,098,139, or $1,320,592 greater than for the corresponding period last year. After charging off $406,031 for depreciation, as against $267,373 last year, there was a balance of $1,692,108. With federal tax reservations and all other charges deducted, there was a surplus of $1,452,859, just $1,118,084 greater than the surplus for the first half of 1921. This surplus, after deducting preferred dividends, is equal to $1.89 a share on the $20,401,000 common stock. In the same six months last year the company earned 6c. a share on its common stock. According to President Lamont the company has two months' supply of coal on hand and enough unfilled business on the books to maintain present plant operations of 75 to 80 per cent of capacity over the balance of the year. Earnings during the second three months were double those of the first three, and according to Mr. Lamont should further improve during the last half of 1922.

American Locomotive Deficit

The American Locomotive Co. reports gross earnings of $7,399,934 for the six months ending June 30, as against $25,989,781 for the first half of 1921, and after all charges a deficit of $2,591,780, the first time since 1915 that the company has operated at a loss in any half year period. For the half year ending with June, 1921, a surplus of $2,276,043 was shown.

The financial position of the company is very strong, however. For instance, on June 30, it did not have a loan note outstanding, while cash and marketable securities amounted to $24,448,304. After providing for reserves, there was a net of current assets of $39,113,392. In addition, unfilled orders on the books of the company have increased about 100 per cent since June 30, the actual value of which stands at $9,067,980.

Wickwire-Spencer Earnings

The income account of the Wickwire-Spencer Steel Corporation for the three months ending June 30 gives sales as $4,556,744. After deducting the cost of sales and other administrative expenses there is a net of $465,343, and after miscellaneous and credit charges, without allowing for depreciation and bond interest, a net profit of $188,033, contrasted with a net profit of $42,427 for the previous three months.

Thus the showing for the second quarter was slightly better than for the first three months of 1922, even after allowing more liberal miscellaneous charges. Sales for the six months ending with June amounted to $8,761,216, and after allowing for cost of sales, administration, etc., there was a net of $801,755. Miscellaneous changes, plus credits, resulted in net profits of $230,461.

Midvale's Second Quarter

The income account of the Midvale Steel & Ordnance Co. for the second quarter showed a deficit of $1,435,111, contrasted with one of $1,289,393 for the corresponding three months last year. For the first half of the year a deficit of $2,587,938 is shown, whereas for the same period last year there was a deficit of $2,684,595. The amounts charged off in the first six months this year for depreciation and depletion were $429,146 less than was the case in 1921.

The quarter compares as follows:

	Second Quarter, 1922	First Quarter, 1922	Second Quarter, 1921
Net earnings	$352,374	$387,970	$87,490
Add oper. profit adjust. from first quarter	.....	.....	659,014
Net	$352,374	$387,970	$571,524
Interest	737,209	743,249	755,439
Deficit	$384,835	$355,279	$183,915
Depreciation, etc.	1,050,276	797,548	1,105,478
Deficit	$1,435,111	$1,152,827	$1,289,393

The Porcupine Co., Bridgeport, Conn., manufacturer of boilers, tanks, etc., and fabricators of structural steel, with a large plant at Fairfield, Conn., recently voted to increase the capital stock from $150,000 to $250,000, for expansion.

Trade Changes

Fred T. Ley & Co., Inc., Springfield, Mass., announces the removal of its Boston office to the sixth floor of the Bradbury building, 230 Boylston Street.

The general sales, accounting and financial offices of the Wickwire-Spencer Steel Corporation will be moved from Worcester, Mass., to New York. The operating department headquarters and other general offices will remain in Worcester. The corporation's New England business will be handled through a divisional sales office at Worcester, with C. K. Hardy, assistant sales manager, in charge. Allan S. Fraser, general sales manager, will be located in New York and Frank Kilmer, treasurer, and John A. Denholm, assistant sales manager, will spend most of their time there. The office of T. H. Wickwire, Jr., president, will be moved from Buffalo to New York.

Frank W. Williams has purchased from Mrs. Giertsen all of the stock of the Chicago Machinery Exchange, an Illinois corporation, and the West Side Iron Works, a Michigan corporation. He will continue these businesses at the present address, 1219 Washington Boulevard, Chicago, until Sept. 30. After Oct. 1 he will remove to buildings which he owns at 1506-22 West Twenty-second Street, which he considers more suitable than the present location. He expects to cover the country thoroughly with woodworking machinery salesmen. The smaller and rural trade will be handled by mail.

The T. J. Flynn Metal Works, 31-35 Albany Street, Cambridge, Mass., which dissolved in 1918, has been reorganized. A complete line of metal working equipment has been installed in the plant.

Pratt & Cady Co., Inc., Hartford, Conn., announce that the heater business formerly conducted by them, as successor to I. B. Davis & Son, has been purchased by the Whitlock Coil Pipe Co., Hartford.

David W. Allen, formerly associated with Edgar E. Brosius, Pittsburgh, and Edward T. Morgan, who formerly handled sales in the Pittsburgh district for the Chesapeake Iron Works, Baltimore, have formed a partnership with offices in the State building, Pittsburgh, under the firm name of the Allen-Morgan Engineering Co., and will specialize in material-handling equipment. The firm represents the Barber-Foster Co., Cleveland, and the Columbus Conveyor Co., Columbus, Ohio.

The Heisler Locomotive Works, Sixteenth and Hickory streets, Erie, Pa., and the Globe Iron Works, Fifteenth and Myrtle streets, Erie, have been merged under the name of the first noted company, with a capital of $400,000.

The Western Iron Stores Co., Milwaukee, of which John A. Camm, formerly sales manager, Kearney & Trecker Corporation, became president and general manager on Aug. 1, is remodeling its store and warehouse. The Western company announces that it has taken the representation in Wisconsin of the Hoefer line of machine tools manufactured at Rockford, Ill.

The Hartford Tap & Gage Co., Hartford, Conn., has recently changed the name of the company to the Hanson Tap & Gage Co. The personnel of the company remains the same.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossbile to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

	Per Lb.
Bars:	
Refined iron bars, base price	2.83c.
Swedish bars, base price	7.00c.
Soft steel bars, base price	2.83c.
Hoops, base price	4.03c.
Bands, base price	3.63c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	2.93c.
Channels, angles and tees under 3 in. x ¼ in., base	2.83c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	2.83c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	2.93c.
Toe-calk, ½ x ⅜ in. and larger	3.70c.
Cold-rolled strip, soft and quarter hard	6.25c. to 7.25c.
Open-hearth spring steel	4.00c. to 6.00c.
Shafting and Screw Stock:	
Rounds	3.65c.
Squares, flats and hex	4.15c.
Standard cast steel, base price	12.00c.
Extra cast steel	17.00c.
Special cast steel	22.00c.

Tank Plates—Steel

¼ in. and heavier	2.93c.

Sheets

Blue Annealed

	Per Lb.
No. 10	3.93c.
No. 12	3.98c.
No. 14	4.03c.
No. 16	4.13c.

Box Annealed—Black

	Soft Steel C. R., One Pass, Per Lb.	Blued Stove Pipe Sheet, Per Lb.
Nos. 18 to 20	4.00c. to 4.30c.	.....
Nos. 22 and 24	4.05c. to 4.35c.	4.60c.
No. 26	4.10c. to 4.40c.	4.65c.
No. 28	4.20c. to 4.50c.	4.75c.
No. 30	4.45c. to 4.75c.	.....

No. 28 and lighter, 36 in. wide, 10c. higher

Galvanized

	Per Lb.
No. 14	4.30c. to 4.60c.
No. 16	4.45c. to 4.75c.
Nos. 18 and 20	4.60c. to 4.90c.
Nos. 22 and 24	4.75c. to 5.05c.
No. 26	4.90c. to 5.20c.
No. 27	5.05c. to 5.35c.
No. 28	5.20c. to 5.50c.
No. 30	5.70c. to 6.00c.

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
½ in. Butt	—53	—38	¾ in. Butt.	—30	—13
¾ in. Butt	—58	—45	1½ in. Butt.	—32	—15
1-3 in. Butt	—60	—47	2 in. Lap	—27	—10
2½-6 in. Lap.	—57	—44	2½-6 in. Lap.	—30	—15
7-8 in. Lap	—53	—30	7-12 in. Lap.	—23	— 7
9-12 in. Lap.	—49	—30			

Steel Wire

BASE PRICE* ON No. 9 GAGE AND COARSER	Per Lb.
Bright basic	3.50c. to 3.75c.
Annealed soft	3.50c. to 3.75c.
Galvanized annealed	4.25c. to 4.50c.
Coppered basic	4.00c. to 4.25c.
Tinned soft Bessemer	5.50c. to 5.75c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	18¾c. to 19¾c.
High brass wire	19¼c. to 20¼c.
Brass rod	16¼c. to 17¼c.
Brass tube, brazed	25⅝c. to 26⅝c.
Brass tube, seamless	22½c. to 23 c.
Copper tube, seamless	24¾c. to 25 c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 21¾c. to 22¾c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin Grade "AAA" Charcoal 14x20	Bright Tin Grade "A" Charcoal 14x20	Coke—14-20	Primes	Wasters
		80 lb.	$6.05	$5.80
		90 lb.	6.15	5.90
		100 lb.	6.25	6.00
IC	$10.00	$8.50	IC. 6.40	6.15
IX	11.50	10.00	IX. 7.40	7.15
IXX	13.00	11.25	IXX. 8.40	8.15
IXXX	14.25	12.50	IXXX. 9.40	9.15
IXXXX	16.00	14.00	IXXXX. 10.40	10.15

Terne Plates

8-lb. coating, 14 x 20

100 lb.	$7.00
IC	7.25
IX	7.50
Fire door stock	9.00

Tin

Straits, pig	35c.
Bar	42c. to 46c.

Copper

Lake ingot	15¼c.
Electrolytic	15 c.
Casting	14¾c.

Spelter and Sheet Zinc

Western spelter	8 c. to 8½c.
Sheet zinc, No. 9 base, casks	8¾c. open 9¼c.

Lead and Solder*

American pig lead	6¾c. to 7c.
Bar lead	8c. to 8½c.
Solder, ½ and ½ guaranteed	25c.
No. 1 solder	23½c.
Refined solder	20¼c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	75c.
Commercial grade, per lb	35c.
Grade D, per lb	25c.

Antimony

Asiatic	6½c. to 7c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb....25c. to 27c.

Old Metals

Prices generally are unchanged but the market is strong. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	11.75
Copper, heavy wire	11.25
Copper, light and bottoms	9.25
Brass, heavy	6.25
Brass, light	5.25
Heavy machine composition	8.50
No. 1 yellow brass turnings	6.50
No. 1 red brass or composition turnings	8.00
Lead, heavy	4.50
Lead, tea	3.50
Zinc	3.25

THE IRON AGE

New York, August 31, 1922

ESTABLISHED 1855

VOL. 110, No. 9

Costs of Electric Steel Melting

Comparison of Methods Shows Basic Higher Than Acid* —Power Charge, Electrodes and Labor Chief Controlling Items

BY CHARLES WELLMAN FRANCIS

IT is the purpose of the author in this article to give the readers the benefit of a cost calculation which is based on actual operating data taken from practice in the field of electric furnace work. Elaborate charts and tables for figuring costs and methods for handling the same might be given, including overhead, depreciation, insurance, etc., but, after all, there would be no meaning to such information which would only apply to one particular case. However, if figures, giving the material and labor used in an electric furnace heat, are tabulated to arrive at a cost per ton of molten metal in the ladle, one will have information which is valuable and applicable to any foundry.

For such comparison the writer has chosen for his basis of figuring the ordinary type of mild steel for castings, analyzing 0.20 to 0.25 per cent carbon; 0.65 to 0.75 per cent manganese; 0.30 per cent silicon, acid steel specification for phosphorus and sulphur being 0.06 per cent or under while the basic specification to be met is 0.04 per cent phosphorus and sulphur or under. Assuming the use of a 3-ton furnace, charged about 15 per cent over capacity, using raw materials at prices f.o.b. Pittsburgh, the table shows the comparison in detail of acid and basic electric furnace operations.

Table of Comparison in Detail of Acid and Basic Electric Furnace Operation, 3½ Tons per Heat

Materials	Price per Net Ton	Acid Practice Amount	Acid Practice Cost	Basic Practice Amount	Basic Practice Cost	Remarks
Foundry scrap	$13.80	2,760	$19.04	2,760	$19.04	40 per cent of charge
Punchings	15.00	1,035	7.76	1,035	7.76	15 per cent of charge
Plate scrap	13.20	1,380	9.11	1,380	9.11	20 per cent of charge
Heavy axle turnings	13.20	1,725	11.39	1,725	11.39	25 per cent of charge
Melting loss, 3 per cent	0.42	207	1.43	207	1.43	
Scrap handling	0.50	...	1.70	...	1.70	
Laboratory costs	0.50	...	1.70	...	2.00	
Ferromanganese	67.50	55	1.86	38	1.28	
Ferrosilicon	60.00	27	0.81	40	1.20	
Aluminum	380.00	6	1.14	4	0.76	
Ganister	....	130	1.70	...	...	
Silica sand	....	50	1.70	...	...	
Lime	12.00	...	...	150	0.90	
Coke	15.00	...	...	40	0.30	
Dolomite	20.00	...	...	175	1.74	
Electricity	1½c. per kwhr.	2,040 kwhr.	30.60	2,550 kwhr.	38.25	
Electrodes	180.00	74.8 lb.	6.73	102 lb.	9.18	
Furnace and roof brick	0.50	...	1.70	...	2.55	
Fire clay	0.50	...	1.70	...	1.70	
Fuel oil ladle heaters	2.00	...	6.80	...	6.80	
Miscellaneous operating expenses	1.00	...	3.40	...	3.40	
Labor	...	...	4.25	...	6.39	
Total		7,189	$114.70	7,185	$126.88	
Cost per net ton			32.77		36.25	

Foundry and Purchased Scrap

Considering the items as they appear in order in this table, let us take up the problem of the foundry scrap. This item includes all gates and risers that have been cut from the castings together with floor scrap and any small ladle skulls. This total usually amounts to from 40 to 50 per cent of the weight of the metal melted which is, of course, exclusive of the 3 per cent melting loss. Consequently in order to use up all of the foundry scrap each charge must contain at least 40 per cent foundry scrap which is figured at the average cost of the purchased scrap.

The purchased scrap is made up of the best grades of quick melting basic scrap and it will be noted that the same charges are figured for both acid and basic heats. By this method the most outstanding differences between the two types of practice can be noted. Using punchings, plate scrap and heavy axle turnings on the acid bottom will generally give a final analysis of approximately 0.055 per cent phosphorus and sulphur,

*In the issue of July 27, p. 201, the author discussed the choice of an electric furnace; in the issue of Aug. 3, p. 277, the economy features of electric foundry design and equipment; in the issue of Aug. 10, p. 345, acid electric furnace practice, and in the issue of Aug. 17, p. 421, basic electric furnace operation.

while with the use of two slags in the basic furnace a specification of 0.04 per cent phosphorus and sulphur as an upper limit can be readily met.

A figure of 50c. per net ton is allowed for handling the scrap which includes its unloading from railroad cars to the stock bins, exclusive, however, of charging the furnace which is taken care of in another item.

Laboratory Costs and Repairs to Bottoms

The laboratory costs of 50c. per ton figure approximately $1.75 per acid heat and $2.00 per basic heat, the reason for the difference being that, in the case of the basic heat, an additional preliminary analysis for manganese is usually made which is dispensed with in the acid heat because the manganese is practically all lost in the acid melting and a 100 per cent addition is generally necessary. However less ferrosilicon is used in the acid heat, the reason being self-explanatory. In the case of aluminum, however, we have to deal with an addition which is up to the melter himself, no specified amount being necessary; the entire item might be considered a precautionary addition. Two pounds per ton can be considered ample under these conditions in both acid and basic practice.

It is not the easiest matter to figure costs on bottom repairing and slag materials, due to the fact that the amounts used fluctuate according to the working of the furnace. For example the amount of rust on the scrap has considerable to do with the amount of slag necessary, but the figures given in the table may be considered sufficient for these purposes.

Electric Power and Refractories

The electric power supplied to the furnace can be readily measured by the watt hour meter connected in the circuit. The current is not usually supplied on a flat rate but the demand and peak-load enter into this cost appreciably. Good consistent acid operation will utilize an average of approximately 600 kw. per net ton of metal melted while basic operation, which is considerably slower due to the manipulation of the slags, will consume 725 to 750 kw. per net ton of metal melted. The electrode consumption is consequently less in acid operation than in basic operation, the element of time entering into this question.

Refractory cost is another item which varies considerably. The less expensive acid refractories do not last as long, due to the fact that hotter metal is usually poured from the acid furnace and also because less protection is offered by the slag. On the other hand the more expensive basic refractories have a longer life, due to colder metal being poured and the protection which is given by the heavier basic slag. This additional expense is lessened considerably by using acid refractories for the roof and sidewalls above the slagline on the basic furnace. In this case the costs of acid and basic refractories will be nearly equal, and in instances where heavy work only is being poured in the foundry, the cost of the acid refractories may even exceed that of the basic.

The item of operating expense includes the incidental operations around the furnace such as furnace tools, mechanical repairs, etc. The same amount of labor is necessary for operating an acid and basic furnace, but here the element of time plays an important part, approximating about $2.00 per hr.

Three Controlling Items

A close analysis of the table will show that there are three items which enter into the cost of electric steel which are responsible for practically the entire difference, namely, power, electrodes and labor. The governing factor throughout is the element of time. In other words if an acid and a basic heat could be made in the same length of time, other factors being equal, the cost would be practically the same for both.

PROPOSED ADDITIONS

Trumbull Steel Co. Will Build More Open-Hearth Furnaces—Other Valley Plant Plans

Plans of the Trumbull Steel Co., Warren, Ohio, provide for the installation at some future time of eight additional open hearth furnaces. The company now has a complement of seven open hearths, but its blooming mill and bar mill have sufficient capacity to roll the output of eight additional units. In recent years, the company has been gradually increasing its capacity, until it can now produce 40,000 tons of steel products per month, including billets, sheet bar, blue, black and galvanized sheets, galvanized and painted roofing, electric sheets, tin mill black, tin plate, hoops, bands and hot and cold-rolled strip steel.

It employs about 6000 men, or nearly half the working population of Warren, and is self-contained. Its ore mines in Minnesota will take care of its present needs for 15 or 20 years. The Trumbull Coal Co., a subsidiary, operates coal mines in Greene county, Pennsylvania. The Trumbull-Cliffs Furnace Co., in which the Trumbull Steel Co. is a joint owner, operates the largest blast furnace in the Mahoning Valley, with a rating of 600 tons per day, but which can easily produce up to 700 tons daily under normal circumstances. The ore yard is 500 ft. long and has a capacity of 500,000 tons.

Another projected expansion in the Youngstown district is a four-mill addition to the sheet plant at Niles, Ohio, of the Falcon Steel Co. The Brier Hill Steel Co. has developed plans for an extensive expansion program, which will probably be worked out, at least in part, unless a merger is effected with an interest supplying additional capacity. It is understood the program of the Brier Hill company calls for the expenditure of between $7,000,000 and $8,000,000. No extensions have been authorized, however, pending merger developments.

The principal current construction in the Mahoning Valley by steel interests includes the erection of a mechanical puddling plant at Warren, by the Youngstown Steel Co., and a six-mill addition by the Newton Steel Co., at Newton Falls, Trumbull county. This expansion will increase the facilities of the plant to 16 complete units, and bulk of the output will consist of full finished sheets.

Will Make Recommendations as to Periods of Depression

WASHINGTON, Aug. 29.—Announcement was made last week that the President's Conference on Unemployment has begun to prepare recommendations for lessening the severity of intermittent business depressions, and in consequent reducing unemployment. After having been in the hands of a number of experts for several months, the report on "Unemployment and Business Cycles" has been transmitted to the Committee on the Business Cycle, and the latter is now at work on its recommendations. Final action on the recommendations will be taken when the committee meets in Chicago on Oct. 2. The committee consists of Owen D. Young, chairman; Joseph H. DeFrees, Matthew Woll, Clarence Mott Woolley, Miss Mary Van Kleeck, and Edward Eyre Hunt. The report, with an introduction by Secretary of Commerce Hoover, will be published on Dec. 1.

Employment in Great Britain is improving. The number of unemployed on July 31 is given as 1,400,000, against 1,455,000 at the end of June. It is officially stated that Great Britain has paid out £85,000,000 under the unemployment insurance acts, since November, 1920. At an average of $4 per £1, this amounts to $340,000,000.

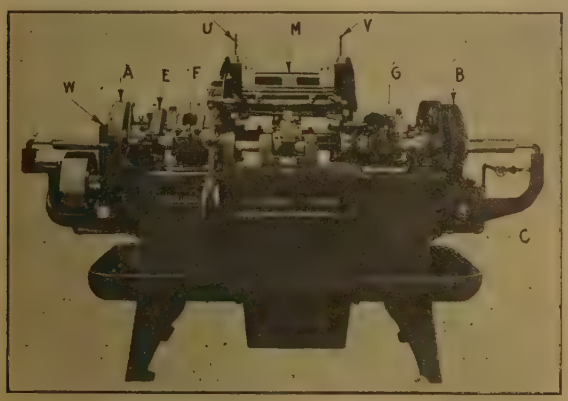
STAYBOLT THREADING MACHINE

Full-Automatic High-Speed Unit Threads Both Ends Simultaneously—Operation Outlined

The Cleveland Automatic Machine Co., Cleveland, has placed on the market a fully automatic machine which, although designed primarily for threading simultaneously both ends of a forged or rolled staybolt is equally useful for all double-ended turning and threading work, such as studs, pipe nipples and short shafts. Both threaded ends are in line, and the lead continuous from one threaded portion to the other.

The machine has two heads and is adapted to high speed operations. It will thread staybolts up to 1 15/16 in. in diameter and from 7 to 18 in. long, the time to complete a bolt being from 35 to 60 sec., according to the diameter and length of thread. Little time is required for chucking the work, the time of cutting a bolt being that required for threading the longest end. One man can operate five machines, his job being to keep the magazine full, keep the chasers sharp and remove the finished bolts.

The general construction of the machine may be noted from the accompanying illustrations. It is made up of a hopper which holds the supply of staybolt blanks, a work-feeding mechanism, a pair of floating jaws which hold the staybolt and present it to the dies so that both ends are in exact alinement, two spindles to carry the die-heads and a large lead screw with long bronze nuts. Cam mechanisms operate the various parts automatically.



Double-Ended Threading Machine for Staybolts and Similar Work. Front view is shown at left and details of clamping jaws above

The spindles are driven from the main driving shaft by gears at *A* and *B*. Helical gears drive the feed shaft at *C*, which in turn drives the camshaft through change gears located in a box at the rear. Gears at *E* drive the lead screw which is mounted directly back of the die spindles. During the cut, the lead screw controls the two die slides, *F* and *G*, after which the heads are opened by stops shown at *H* in the detail. The lead screw nuts are tripped by cams and the slide returns rapidly by means of cams on the cam drums. When the die heads are just clear of the work, the work-holding jaws open and move backward. The finished staybolt is then ejected, dropping into the pan, and a rough staybolt automatically placed in position for threading.

The magazine is located at *M* and the carriers at *U* and *V*. Part of the backward movement of the toggle mechanism for controlling the work-holding jaws withdraws the slide on which the jaws are mounted, permitting another staybolt to drop from the magazine. The carriers then move down, bringing the blank in line with the dies. The toggle mechanism advances the slide with its jaws open until the latter are ready to close on the staybolt, at the same time seating the bolt against two V-blocks provided to line it up. The jaws then close on the bolt, and the two carriers return to their upper position, the die moving forward.

Allowances for variation in the diameters of the centers of the bolts are made by the bearing spring, *N*, in the upper jaw. The two parts of the gripping jaws are pivoted on a stud and operated by the toggle shown at *P* in the detail, which is operated by the lever *Q*. The lever in turn is controlled by cams through another lever. The lower end of the slot in lever *Q* is enlarged to give a slight movement, permitting the jaw slide to shift forward or back and the jaws to oscillate or float on the stud to accommodate a bent staybolt. A shearing pin is provided to prevent damage should a blank be very much out of shape.

Starting and stopping is controlled by handle *W* which operates the friction clutch. A heavy stream of cutting oil is pumped through each spindle to wash out chips and cool and lubricate the chasers.

No Profiteering in Farm Implements

That there was no profiteering in the farm equipment industry either during or after the war is confirmed in Part 3 of the Report of the United States Commission on Agricultural Inquiry, made public at Washington. To quote in part: "It will be noted that the peak reached in prices of agricultural implements over 1913 or 1914 was 75 per cent, whereas the wholesale prices of all commodities reached a peak of 172 per cent. From investigations made by this commission, it was also found that the present factory prices of agricultural implements, if power equipment and twine are not included, when compared with prices of 1914, show an increase of 41 per cent; if power equipment and twine were included in the computation, the increase in prices over those of 1914 would be less than 20 per cent, while the present prices of all commodities when compared with 1914 prices show an increase of 52 per cent." (The comparisons are between prices in January, 1922, and those prevailing before the war.)

Detroit Scrap Market Active

DETROIT, Aug. 28.—The local scrap market is active and shows a tendency to follow the advances registered in pig iron. Relatively little scrap produced in Detroit is consumed here, going principally to Cleveland and Valley points, and prices realized are governed largely by what can be obtained from mills and furnaces in those districts. The local production, judging from the tonnages offered by automobile concerns, so far shows no decline. The Dodge awards will be announced during the week and will include around 3000 tons of borings, turnings, flashings and hydraulic compressed, with perhaps 500 tons of shoveling, melting, busheling and miscellaneous grades. Good machinery scrap is in demand, reflecting the shortage of pig iron.

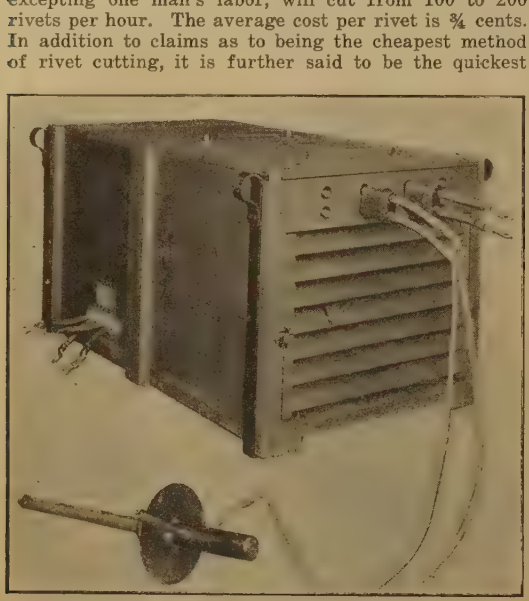
The following prices are on a gross-ton basis, f.o.b. cars producers' yards:

Heavy melting steel	$14.50 to $15.50
Shoveling steel	14.00 to 15.00
No. 1 machinery cast	16.00 to 16.50
Cast borings	12.00 to 13.00
Automobile cast scrap	20.50 to 21.50

Arc Rivet Cutting Apparatus

A 600-amp. arc-welding and cutting machine operated by alternating current and adapted especially to rivet cutting, but for use also in carbon arc welding, is being offered by the Electric Arc Cutting and Welding Co., Newark, N. J.

As an example of the economy of the machine in cutting rivets, it is stated that an hourly outlay of 10 to 15 cents for power and practically no other costs excepting one man's labor, will cut from 100 to 200 rivets per hour. The average cost per rivet is ¾ cents. In addition to claims as to being the cheapest method of rivet cutting, it is further said to be the quickest



Welding and Cutting Transformer. Both the core loss and magnetizing core are cut off when not in use

and is far safer than rivet busting, with the additional advantage that the sheet itself is not impaired.

The arc will cut any metal. For heavy work or for careful work gas is recommended, although for rough work, such as cutting up scrap or for work requiring machining subsequently, the electric arc is said to be the cheaper if the pieces are not too thick. For cutting non-ferrous metals this method is said to be pre-eminent. For straight arc cutting the thickness that can be economically "eaten through" by the arc lies between 2 and 6, depending on price of power and other considerations. If the method of nicking and breaking is used, the machine is said to be employed to advantage. It is to be noted that the cutting characteristics of the machine are different from the welding characteristics. The voltage across the arc is higher and the drooping characteristics desirable in welding for a close arc are pared down in arc cutting. The machine gives lower voltages with increase of current.

A high grade of silicon steel of low current density, double asbestos covered is used in the construction of the transformer and the primary magnet wire has micanite between the layers. Double micanite and ¼-in. asbestos spacers are placed between the primary and secondary. There are large air ducts between the iron and the copper and between the copper layers, a special bucket-type ball-bearing blower being provided to drive air through these spaces continuously when power is being used by the transformer.

Both the core loss and magnetizing core are cut off when not in use by means of a magnetic switch in the primary, which remains open when the electrode is not in contact with the work or when the arc is not drawn. This is accomplished by a small pilot transformer of 100 watts capacity, which also operates the blower. The pilot transformer circuit is made by the electrode touching the work and the primary load used to hold the magnetic switch in the closed position. When the pilot circuit has been broken by the auxiliary contact having been opened by the closing of the main contacts and the cutting current broken at the arc, the magnetic switch opens automatically and cuts the machine, leads and even the magnetizing current dead. This is a patented arrangement and is claimed to be both an effective safety device and a money saver.

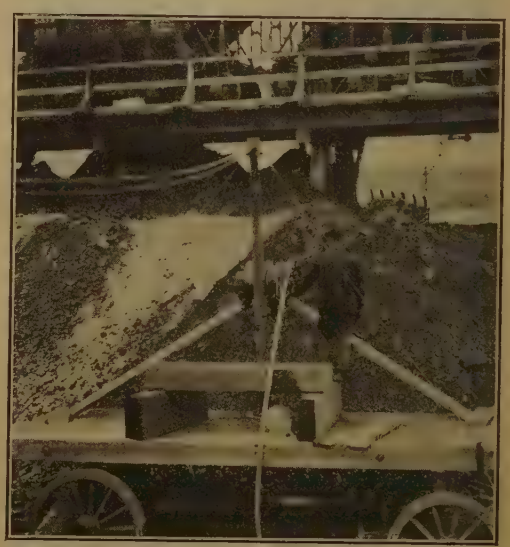
A description of the company's arc welding apparatus appeared in THE IRON AGE of Sept. 12, 1918. In addition to the 600-amp. machine described above a type CW, 300-amp. machine for combination welding and cutting is available, and also a 1000-amp. machine for cutting alone.

Machine Replaces Men in Grading Coal Pile

An iron mining company in the Lake Superior district, fortunate in finding available a large supply of coal, was confronted with the problem of storing it. Storage facilities were not adequate and the problem resolved itself into either enlarging the coal dock or piling the coal in such a manner that it could be stocked with the existing facilities. The latter course was followed.

As shown in the accompanying view of a section of the dock, coal is dumped below the trestle. Grading off is necessary to permit dumping the successive loads of coal, and hand shoveling was the method first employed, twelve men, six on each side of the trestle, being used for this work. Later on a mechanical method for doing the work was installed, the Ingersoll-Rand company's Little Tugger hoist equipped with drag scraper, as shown in the illustration, being pressed into service. With this equipment one man operated the scraper in both the forward and backward motions.

The machine illustrated is a small double-drum hoist developing 7 to 8½ hp. on 60 to 80 lb. air pressure. One drum is called the haulage drum, the other the tail-rope drum and when either of these is engaged the other runs free. The haulage rope is laid from the drum directly to the front of the scraper, the tail-rope being laid from its drum to a snatch block or sheave mounted conveniently behind the coal pile, and attached to the back of the scraper by a clevis.



Apparatus Used in Grading Coal Pile. One man operates the scraper in both the forward and backward motions

Lull in Scrap Buying

YOUNGSTOWN, Aug. 29.—There has been somewhat of a lull in scrap buying, as melters are "sitting tight" for the time being and awaiting developments. One interest recently contracted for hydraulically compressed sheets at $17, but strictly specified that the material is to be Grade A. Other contracts for this class of scrap, but of inferior grades, have been made lately at $16.25. Heavy melting is nominal at $18.25.

Iron Castings by the Centrifugal Process*

British Plant Producing Piston Ring Sleeves and Engine Cylinders —Chilled Wheels and Rolls—Unique Melting Arrangement—Chemical and Physical Properties

BY F. E. HURST

THE process, as at present operated in the works with which the author is connected, is being applied to cast iron for the purpose of producing large size castings for piston ring sleeves, gas, oil, and Diesel engine cylinder liners, chilled wheel and chilled roll castings, and cylindrical castings of all descriptions. The machines at present in operation are capable of producing castings up to a maximum length of 36 in., and of varying diameters from 10 in. up to 30 in. Other machines for the production of both smaller and larger-sized castings are at present in the course of construction.

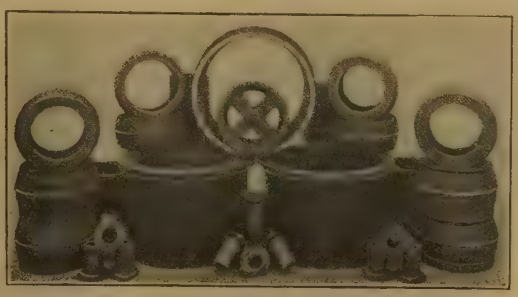
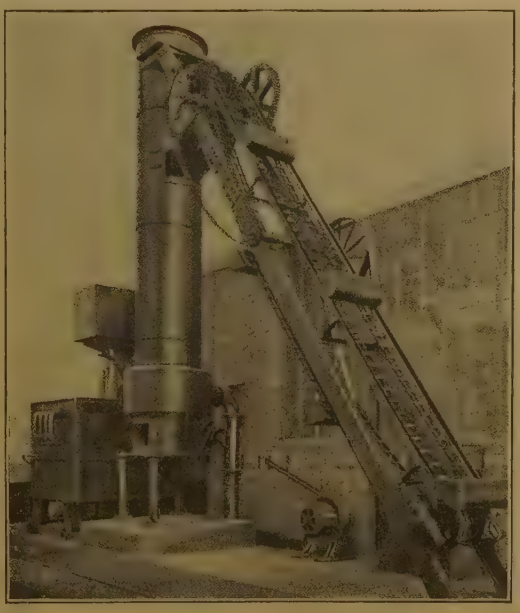


Fig. 1 (Above).—Some of the Cast-Iron Products Made Centrifugally in Great Britain

Fig. 2.—The Novel Cupola and Its Accessories, Known as the Hurst Melting Equipment



The principle of operation of the centrifugal casting process consists of the introduction of molten metal into the mold or die, which is rapidly rotating about a horizontal axis. For cylindrical articles no core is used, and a perfectly cylindrical interior surface is produced direct by virtue of the centrifugal force under which the metal solidifies and the rate of introduction of the metal into the mold. Castings other than chilled castings are produced at the author's works, directly machinable, a feature which is arrived at by strict control of the chemical composition of the metal and the details of the mold and casting operation. Fig. 1 shows some of the product up to date, consisting of from 30-in. diameter flanged sleeves for piston rings to cylinder liners 36 in. in length. Attention is directed to the 14-in. diameter cast iron wheel with a chilled tread for use on small trucks and pit trams.

The machine consists essentially of a face-plate mounted on a shaft carried in bearings arranged to be rotated at the required speeds. The molds are attached to the face-plate by bolts, and when rotating the molten metal is introduced by tilting a specially designed pourer which has been moved into position inside the rotating mold.

The molds themselves are constructed in two parts: An outer holding casting which is arranged to bolt to the faceplate and an inner liner which is arranged to fit loosely inside the holder casting. The liner is bored internally to the size and dimensions of the outer surface of the casting to be produced, and the outside of the liner is bored to fit the holder casting, which is designed to take a group of a series of liners, the dimensions of which are arranged to produce flanged cylindrical castings of a standard series of dimensions. By this means the cost of the renewals of dies for the production of a given size is considerably reduced, and as a rule the series of holders will take most special liners required for the production of castings of special shapes.

The back end of the liner next to the faceplate of the machine is closed by a plate attached to the end of a screwed rod passing through the hollow shaft of the machine and arranged for the ejection of the castings. The front of the liner is closed by an annular plate having the internal diameter of the annular ring corresponding to the internal diameter of the casting to be produced. This plate is arranged to be removable after the completion of the casting operation, in order to allow of the extraction of the casting.

As indicated, a series of standard dimensions of flanged cylindrical castings has been drawn up, and the installation of the necessary holders and liners, to produce these, makes it possible to produce a wide variety of cylindrical castings within the limits of dimensions mentioned above and with comparatively trifling alterations. For example, the only alteration to the die required to produce castings thicker than a given standard casting is an alteration to the diameter of the inner circle of the closing plate. Castings shorter than the standard range of size can be produced by an alteration in the position of the ejector plate. Castings having specially shaped flanges or external projections require a special liner, but here again, in the majority of cases, a special liner only is required, and the expense is not necessarily prohibitive. Castings having internal projections, or closed cylinders or dish-shaped castings, cannot yet be produced on a commercial basis.

For larger-sized castings a somewhat different scheme is under installation, but this possesses sufficient flexibility not to place an undue burden on the cost of the castings. This scheme consists essentially of the use of a complete mold or die which, on comple-

*From a paper, "Centrifugal Castings," presented before the West of Scotland Iron and Steel Institute and published in the Society's *Journal* for January-February, 1922.

tion of the casting operation, is arranged to be removed from the machine along with the casting for stripping purposes. For the production of large numbers of single castings more than one mold would be in progress in order to maintain the sequence of operations. In the case of a casting where the initial cost of more than one die would be prohibitive, it can be arranged to interpose the single die in series with another die for a different casting, thus still maintaining the sequence of operations. The operation is very similar to the casting and stripping of ingots in an open-hearth steel shop.

Chemical Composition of Centrifugal Castings

So far as experience has gone up to the present, it is found that the influence of the various constituents of cast iron follow the same rules as in the case of sand castings. There is an increase in the percentage of rejected hard castings as a result of the increase in sulphur content. This is corrected by a slight increase in silicon content. In cases like these there is no doubt that in the centrifugal casting process the castings are more sensitive to the effects of small changes in the chemical composition.

Carbon.—The advantage of a somewhat lower total carbon content than that of normal foundry irons is well known, and following on this practice it is endeavored to produce high grade castings for cylinder and piston ring work in cast iron with a total carbon content within the range of 2.75 to 3.00 per cent. This is rendered possible by the use of the special melting plant described later.

Table 1.—Variations in Combined Carbon

Sequence No. of Casting	Inside Surface C. C., Per Cent	Outside Surface C. C., Per Cent
1	0.66	0.47
4	0.49	0.00 trace
8	0.55	0.10
12	0.17	0.15
16	0.42	0.05
20	0.22	0.15
24	0.24	0.14
28	0.22	0.14

The combined carbon, on account of the higher silicon content usually worked to, is lower than what is usually obtained in ordinary foundry practice. This is advantageous in castings such as piston rings and the like, which are subject to comparatively high temperature conditions. A series of figures given below, Table 2, show that the variations in combined carbon within the limits of the figures given have practically no influence on the tensile strength value. Starting with a cold mold at normal temperature, the first few castings are invariably chilled on the outer surface or the surface next to the metal mold. As the temperature rises, the chilled surface on the castings rapidly disappears, and the combined carbon gradually reaches a constant value. The figures given serve to show the variation in combined carbon with the order of casting.

The remarkable feature of this series of figures is that the combined carbon is higher on the inside surface than the outside. This is worthy of recording, and is met with quite frequently. The author has preserved a specimen for future examination of a casting showing a layer approximately ⅛ in. deep on the outside surface of the casting, which on examination shows no trace of combined carbon. These figures are included with the object of showing the possibility of variation in the combined carbon values. The average value usually maintained is from 0.3 to 0.5 per cent, unless specially desired when higher values are readily obtained by reduction of the silicon content.

The proportion of graphite present naturally varies with the combined carbon; no case has yet been met of any segregation of the graphite during the casting process. This is strong confirmatory evidence that in cast iron below and up to the eutectic composition the graphite does not form in the liquid state, and is formed quite late in the solidification range. If the contrary were the case, then one would certainly expect to find some indication of the segregation of the graphite to the inner surface of the casting, particularly in view of the wide disparity in the specific gravities of graphite and iron.

Silicon.—The average value of the silicon in centrifugal castings is about 2.75 per cent. This is a somewhat higher value than is usually used in sand-casting practice for high grade work. Lower value than this can be cast.

Sulphur and Manganese.—Sulphur existing as the manganese-sulphur compound which, as is now known, is insoluble in cast iron at the temperatures usually met with in foundry practice, and is also lower in specific gravity, tends to segregate, under the influence of the centrifugal action, to the inner surface.

In castings of thinner cross-section the effect of the segregation is much less owing to the increase in rapidity of the solidification. The use of low manganese irons, or increased casting temperature accompanied with rapid pouring, tends to practically eliminate this segregation in all but very thick castings. As a general rule excess of metal is poured into the rotating mold, which is thrown out in castings of comparatively small length, and along with it the segregates in the shape of sulphur and slag inclusions which have collected on the inner surface.

Phosphorus.—For the successful production of centrifugal castings highly fluid iron is desirable. The well-known effect of phosphorus on this property would appear to be of considerable value in this process. Unfortunately the influence of phosphorus on the properties of centrifugal cast iron appears to be very undesirable and in so far as our investigations have gone it is largely to that element that low tenacity and, what is more serious, "brittleness" in centrifugal castings, is to be attributed. This particularly appears to be the case when the phosphorus is present in conjunction with fairly high silicon values. For high grade castings, therefore, on this account only, low phosphorus material is desirable, and a maximum of 0.60 per cent for special castings is now worked to. This is obtained by the use of steel scrap or hematite, preferably the former, and the necessary fluidity, and incidentally uniformity, is obtained by maintaining a high casting temperature in the melting plant specially designed for this purpose.

Before leaving the question of phosporus, it is of interest to mention a curious tendency noticed on several occasions for the phosphorus to segregate to the outside surface of the castings. This the author believes is worth recording as a similar tendency has been noticed in the case of the eutectic in the die casting of copper aluminum alloys.

The composition of some of the different articles recently made on the centrifugal casting machines are included in Table 2. These figures are included with the object of giving some idea of the range of composition which can be dealt with by this process.

Table 2.—Direct Tensile Tests on Centrifugal Iron Castings

No.	Total Carbon, Per Cent	Silicon, Per Cent	Manganese, Per Cent	Sulphur, Per Cent	Phosphorus, Per Cent	Ultimate Strength, Tons per Sq. In.	Remarks
1	3.21	2.75	0.31	0.11	0.64	17.46	Direct cupola melted.
2	2.99	2.70	0.39	0.09	0.64	19.40	Metal from receiver.
3	2.95	2.85	0.28	0.10	0.92	19.95	Metal from receiver.
4	2.99	1.98	0.35	...	...	19.50	Determined on ring.
5	3.10	2.55	0.29	...	...	19.31	Determined on ring.
6	3.15	2.75	0.29	...	...	18.71	Determined on ring.

Nickel-Chrome Castings

The cast iron containing nickel and chromium is being used for the production of the chilled iron wheels previously mentioned and illustrated. The author is yet unable to give data of the physical properties of this material as centrifugally cast, and its use for this purpose has suggested itself on the basis of certain stationary chill casting experiments of which the author has had previous experience. The main object in using this material is the desirability of producing a chill having an extremely close grain, as distinct from the somewhat coarser grain of plain cast irons. The com-

position is at present being obtained by melting nickel-chrome steel scrap in the mixture.

Physical and Mechanical Properties

The consideration of the mechanical properties of centrifugal castings should always be made in conjunction with the chemical composition, and this must be taken into consideration when making comparisons between centrifugal and sand castings. So far as the investigation of the properties of centrifugal cast iron has gone, in all cases a distinct improvement in the mechanical properties has been found. An improvement would, of course, be expected on the grounds of the use of a metal mold, although there is no doubt that the centrifugal method itself has considerable influence in modifying the properties of the cast iron.

The figures given in Table 2 are the results of tensile strength determinations on bars and rings cut from centrifugal castings of the compositions as given. These results show the influence of the reduction in total carbon content in increasing the tensile strength and the slight falling off in strength with increased silicon content. In all cases the values are slightly higher than would be obtained from sand castings of identical composition. Where the determination was made on rings, the procedure recommended in British Engineering Standards Specification, 2 K. 6, was followed, using the formula set out therein for obtaining the breaking load per square inch of section.

Resistance to Wear

The results of some determinations of the resistance to wear determined by the use of a special machine designed by the author are given in the following table, Table 3. Both samples tested were of the same composition and from the same cast. The sand cast specimens were prepared from standard ¾-in. diameter

Table 3.—Results on Resistance to Wear

CENTRIFUGALLY CAST METAL

	Grams	Loss, Grams
Original weight of specimen.....	6.7500	
Weight after 3,000,000 revolutions.....	6.7349	0.0151
Weight after 4,000,000 revolutions.....	6.7339	0.0010
Weight after 5,000,000 revolutions.....	6.7335	0.0004
Weight after 7,000,000 revolutions.....	6.7331	0.0004
Total loss		0.0169

SAND CAST

	Grams	Loss, Grams
Original weight of specimen.....	6.7530	
Weight after 3,000,000 revolutions.....	6.7455	0.0075
Weight after 4,000,000 revolutions.....	6.7425	0.0030
Weight after 5,000,000 revolutions.....	6.7325	0.0100
Weight after 7,000,000 revolutions.....	6.7220	0.0105
Total loss		0.0310

round bars, and the centrifugal cast specimens were machined from cylindrical castings having a wall thickness of approximately ⅝ in. The tests were made under strictly comparable conditions. These figures are the only long series that the author has yet available, and are taken on a material with high silicon.

The state of our knowledge of the factors governing wear in materials is insufficient to allow of the broad conclusion that these results are characteristic of centrifugal castings, and they are included merely as the results of a long comparative test. The figures in themselves are rather remarkable, indicating as they do a greater loss in weight in the centrifugal casting of the above composition in the earlier stages of the test. The magnitude of this loss in weight in the centrifugal casting decreases as the test is prolonged, and has apparently reached a constant value, whereas in the sand casting the loss in weight increases steadily with the prolongation of the test.

[The author discusses the microstructure of centrifugal castings of iron and his conclusions agree with other articles published in THE IRON AGE. There are also a few paragraphs on pin and blowholes.]

Novel Melting Plant

An improved melting plant has been designed and installed, to supply hot metal of regular and uniform composition for the production of castings by this process.

The ordinary type foundry cupola is used, but this has been arranged to charge direct from the ground level into the charging door by means of a bucket-type elevator. The tap hole of the cupola furnace is directly connected by a refractory lined channel to a specially designed auxiliary oil fired receiver, and the molten metal is allowed to run freely into the receiver.

The receiver consists of an inclosed shallow hearth capable of holding two or three tons of molten metal. Four oil burners of the low-pressure type, supplied with air at about 20 to 25 in. water pressure, and fuel oil from an elevated tank, are arranged as shown in Fig. 2. The air for the oil burners is arranged to pass through a series of re-heater pipes, built into a chambered space above the roof of the hearth, through which the hot waste gases from the combustion of the oil in the hearth are led. By this means a portion of the heat from the waste gases is utilized and hot air is supplied to the burners which aids the efficiency and contributes somewhat to the economy of the furnace. An inspection door is also provided on the oil-fired receiver.

No reduction has been made in the height of the coke bed of the cupola furnace in this instance for special reasons, but in the ordinary way there is no reason why the bed should not be lowered to within a few inches of the bottom of the cupola. This would, of course, effect considerable economy in the coke consumption of the cupola section of the plant.

An auxiliary tuyere has been provided on the cupola, leading air from the tuyere belt to the bottom of the bed. This has been found a considerable advantage in starting up and in maintaining the bed very hot in the earlier stages of the melting, thus preventing the choking of the outlet into the oil-fired receiver. This auxiliary tuyere is closed up after the cupola has been running for some time. An additional tap hole (not visible) and spout are attached to the cupola. This serves the dual purpose of enabling metal to be taken direct from the cupola if desired, and enables slag and metal to be drawn off from the cupola without spoiling the main tap hole leading to the receiver.

In actual operation the burners of the oil-fired receiver are lighted after the bed of the cupola has been charged. Starting from dead cold, the oil-fired receiver is heated up to a temperature high enough to receive the molten metal from the cupola in 40 to 60 min. with the full burner power. With the furnace in constant use, this initial heating period is reduced to from 20 to 30 min. During this period the cupola is being charged, after the completion of which melting is started. Immediately the cupola commences to melt and molten iron collects in the receiver, the burners are gradually closed down until, with constant running and constant demand for molten metal by the foundry the temperature can readily be maintained with one burner working at less than half its capacity. With this burner system any adjustment can be made according to the demands of the foundry, and as an example of the utility of the system we have during the initial stages repeatedly held and maintained as small a quantity as 10 cwts. of molten metal at a perfect casting temperature for periods varying from one to two hours.

The molten metal collecting in the receiver is tapped out from a tap hole provided (not shown) in small or large quantities according to the requirements of the foundry. This tap hole is provided with a hinged spout, which when dropped down releases a sheet iron cover holding up a sand breast, which can readily be knocked down for the purpose of cleaning and fettling the receiver after each day's melt. The receiver is also mounted on truck wheels, so that it can be moved from the cupola for relining or any other purpose, when the cupola can be used in the ordinary manner.

The average oil consumption including the starting-up period, varies from 5 to 8 gal. per hr. These figures have been taken over the last few months, during which the oil furnace has been working under very disadvantageous intermittent conditions. With continuous daily working a much lower consumption figure would result. The additional oil fuel cost is largely off-set by the reduced labor cost, charging, etc.

This plant enables low total carbon mixtures and steel mixtures to be produced regularly, and for high grade castings this is its primary advantage.

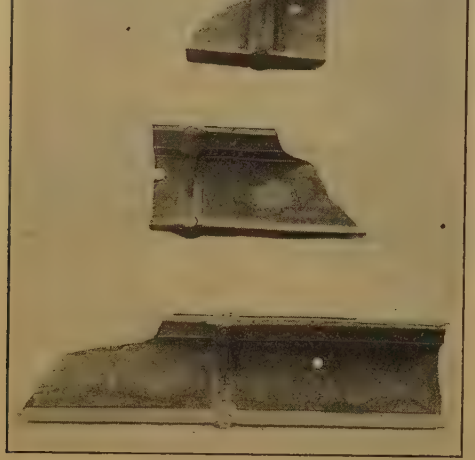
THERMIT INSERT RAIL WELD

Modified Collar to Reduce Cost and Increase Strength of Weld—New Mixture Developed

Savings varying from $2 to $3 per joint are announced as possible by the recent development by the Metal & Thermit Corporation, New York, of a modified thermit insert rail weld, wherein the usual reinforcing collar is proportioned to give a weld with considerably less thermit than was formerly believed necessary.

The modified weld, known as the center pour weld, involves no fundamental changes from the type of thermit insert weld which has been used extensively for 10 yrs. by street railroads throughout the United States. By making a great many welds and then breaking them, it was found possible to change gradually the design of the pattern to utilize the thermit steel collar in the most scientific manner and to the best advantage. A slight rearrangement has also been made in the proportions and locations of the pouring gate, heating gate and riser. A narrower gap is also used between rail ends. It has been found that an average of ½ in. gap will give the best results.

The saving in using the new weld consists not only in a saving of the thermit welding portions but also in the crucibles, as a smaller crucible can be used, which in turn gives several more reactions per crucible lining. An average of 25 or more reactions per crucible lining, it is stated, can be obtained.



Sections of Broken Rails Welded with the Modified Thermit Insert Collar

When used in conjunction with new style self-luting mold boxes, which require no hand luting, the operations merely require clamping the molds to the rails, preheating and pouring. The preheating takes 20 min. to ½ hr. per joint and the number of joints which can be welded in a day is only limited to the number that can be preheated. When two joints are preheated at a time, there should be no trouble in making 35 to 40 joints per day with a comparatively small gang.

Thermit insert rail welding operations have also been simplified by the perfection of a new thermit mixture which develops such heat that the additions can be mixed cold in it instead of being put in a can and preheated.

Under recent repeated drop tests, sections of rail welded by this method, broke entirely outside of the weld in every instance, thus demonstrating that the weld was as strong as the rail. The detailed results of some of the six drop tests reported are shown by the following data and in the accompanying illustrations:

Test No. 1: Rail section welded.—Lackawanna Steel Co. 134-506.

Nature of Test: Foundation and support of rail tested —the rail supported on semi-elastic foundation, i. e., steel plates were laid on the dirt floor of the welding shop, on the top of which was placed a 6 in. T-rail, and the rail to be tested in turn placed upon this T-rail on 3 in. centers.

Weight used: 2500 lb. Heights of drops: 20 in., 30 in., 48 in., 79 in.

Results: The last drop was as high as could be given and no deflection or breakage occurred.

Test No. 2: Rail section welded—same as in Test No. 1.

Nature of Test: Foundation and support of rail tested; foundation consisted of two 10 in. square steel billets each 3 ft. 8 in. long imbedded horizontally in the dirt floor of the welding shop. On these billets were placed 6 in. T-rail on 3 ft. center.

Weight used: 2000 lb. Height of drop: One 9 ft. drop only.

Results: Rail tested broke entirely through the rail steel adjacent to the thermit collar.

Test No. 5: Type of rail tested and nature of test similar to Test No. 2 except: Heights of drops 30 in., 48 in., 66 in.

Results: No deflection took place at the 30 in. drop. A deflection of 0.008 in. occurred at the 48-in. drop and the rail broke at the 66-in. drop. The fracture occurred 17 in. from the weld at the base and fractured diagonally up through the rail emerging through the head of 4½ in. from the weld, thus showing a rail and not a weld failure.

Note: In none of the Tests Nos. 1-5 inclusive, did the total length of rail after welding exceed 4 ft.

Test No. 6: Rail section welded—9 in. L. S. Co. 134-470. This section and section L. S. Co. 134-506 (used in previous tests) are almost identical; the only difference being that the 506 section has a slightly curved contour on the running surface of the head, whereas 470 is flat.

Results: No deflection occurred at the 30 in. or 48 in. drop. A deflection of 0.005 in. occurred at the 66-in. drop and the rail broke at the 104-in. drop. The break occurred through the base 8 in. from the weld and ran diagonally upward toward the weld, breaking through the head alongside of the insert and 1¼ in. away from the weld through the lip. There was a bolt hole through the web of this rail about 2 in. away from the weld and the broken specimen shows a crack extending from this bolt hole toward and through the weld. It is possible that had this crack at the bolt hole been absent, the rail may have broken completely through the head away from the weld.

The modified insert weld was demonstrated on May 12 before the members of the committee on way matters of the American Electric Railway Association at the Jersey City plant of the Metal & Thermit Corporation. One man was able to make a mold, preheat and pour a weld in less than one hour's time.

Steel Plant Electrical Engineers to Meet

During the week of Sept. 11 to 15 the Association of Iron and Steel Electrical Engineers will hold its sixteenth annual convention, at Cleveland Public Hall, Cleveland. A list of the eighteen papers to be read was published in THE IRON AGE, July 20, page 138. In addition to the technical sessions there will be an exhibit of apparatus of particular interest to steel mill engineers, covering some 30,000 sq. ft. of floor space in the same building. All of the meetings as well as the exhibits, are open to visitors.

An operating foundry exhibit is to be one of the convention features. The foundry will be equipped for making steel castings, and gray iron and alloy steel. The Pittsburgh Electric Furnace Corporation will supply a 500-lb. Lectromelt furnace.

The West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers will hold its second annual convention Sept. 19 to 22, inclusive, at the City Hall, Huntington, W. Va. The papers announced have to do largely with the engineering problems of mining. In connection with the convention will be a coal and industrial exposition at the Chamber of Commerce Building, Huntington. Among the features will be an illustrated lecture on the manufacture of steel, using motion pictures, by William Richardson, Cambria Steel Co., Johnstown, Pa., and also a showing of films furnished by the Bureau of Mines, illustrating mining and transportation of coal. Herbert Smith, Huntington, W. Va., is secretary-treasurer of the association.

Economic Basis of the Scrap Business*

Its Large Proportions—Place of the Dealer Between Producer and Consumer—Problem of Disposal of Light Scrap

BY CHARLES DREIFUS

THE United States Tariff Commission estimated that for the year 1918 the total consumption of wrought iron and steel scrap in the United States was approximately 18,000,000 tons. This is, of course, only an estimate. It is arrived at by taking the ingot production of the country, deducting the basic and Bessemer pig iron production, allowing for open hearth furnace losses and adding the scrap used by the wrought iron mills and the rerolling trade.

There are no real statistics to show exact consumption, but we may be warranted in the following estimate for 1918:

	Tons
Consumption of iron and steel scrap in open-hearth, Bessemer and electric furnaces (85 per cent of 18,000,000)	15,500,000
Consumption in rolling mills for bushelling, puddling, piling and rerolling	2,500,000
Consumption of blast furnaces, 3 per cent of pig iron production	1,000,000
Consumption in foundries, 20 per cent of foundry pig production	1,000,000
	20,000,000

When we reflect that the total production of pig iron for the year 1918 was only 39,000,000 tons, we gain a new idea of the importance of scrap.

Sources of Scrap

Of course, only a part of this vast total constitutes the scrap trade. Considering the first and most important item in our estimate, the 15,500,000 tons consumed in open hearth, Bessemer and electric furnaces, probably 10,000,000 tons are produced by the plants themselves, in the form of crops taken at various stages of manufacture, leaving perhaps 5,000,000 to be furnished from the outside. This 5,000,000 tons together with the 2,500,000 consumed by the rolling and rerolling mills, 1,000,000 consumed in blast furnaces, and 1,000,000 consumed in foundries, totals about 10,000,000 tons, which for the purpose of our discussion can be considered the volume of the scrap business. In tonnage it is about one-half as great as the United States Steel Corporation's annual production of finished product.

Where does all of this scrap come from? The most important source of supply is the manufacturing plant. Every manufacturing plant that buys iron or steel produces scrap iron or steel. It is estimated that 40 per cent of all iron and steel scrap comes from this source. Production covers every grade, from billet and bloom crops, down to machine shop turnings.

In point of tonnage, scrap yards are the next largest source of supply, with about 35 per cent of the total. Most of the scrap produced by the yards is received from railroads or industrial plants in the form of unassorted or unsheared material that must undergo manipulation before it is in shape to be handled by consumers.

The third source of supply is the railroads, with about 25 per cent of the total.

Thus from industrial plants comes 40 per cent of the scrap; from scrap yards, 35 per cent and from railroads, 25 per cent.

The Work of the Scrap Dealer

The dealer sorts into commercial grades, miscellaneous scrap that is not in a form suitable for consumption. Let us assume a small industrial town, with a few small manufacturing plants. During the course of, say, a month, one plant produces: 2 tons of bar ends; 3 tons of steel turnings; 2 tons of cast iron borings; 300 lb. of burnt cast iron; 800 lb. defective castings.

Four or five months would be required to gather together enough to make a mixed carload, but of course no consumer could use such a mixture. Many months would be required to accumulate a car of steel, a car of borings, a car of turnings and because of the time required, some of the material would deteriorate unless protected.

In such a community the scrap dealer acts as an assembling station. He hauls the monthly accumulations of each plant to his yard, and is thus enabled to ship a car of steel per month, and a car of turnings in two months, a car of borings in three months, and so on. In addition to his function as a sorter and assembler, he shears, or breaks scrap material, which the producers are not equipped to prepare. The relationship above described applies to thousands of small manufacturing plants and hundreds of small dealers scattered all over the country.

A step higher, in point of tonnage, are the manufacturing plants who produce scrap in carload lots. In some cases, these producers sell direct to consumers, but in most cases they sell to dealers, who in turn sell to consumers. In such transactions the dealer functions again as an assembler, for, while the scrap is produced only in lots of one or two carloads, it must be sold to the consumer, because of demand, in lots of hundreds or thousands of tons. But the dealers' service to the producer in such cases goes further. The dealer is in daily touch with consuming markets and knows just where to place each grade to the best advantage. The directing head of the producing plant has no time to keep in touch with a number of markets for a multiplicity of grades. Indeed, for the small amount that he produces, it would be an economic loss to spend so much of his time or of the time of a subordinate doing something that the dealer does as part of his regular daily work.

In effect then, the dealer acts as sales agent for the producer. Competition among dealers is so keen that the producer is usually assured of the highest offers that the market affords.

Mention has been made of the fact that material is usually bought in large tonnages because of demand A steel plant whose requirements for outside scrap totals 25,000 tons per month, purchases the entire amount from a few dealers. These dealers ship part of the order from their own yards, and then operate as purchasing agents for the consumer, seeking scrap from producers and other dealers, and completing the chain that extends back to the small producer.

Were the consuming plant to attempt to take care of its consumption with its own force of buyers, it would undoubtedly be found that the cost of gathering would exceed the dealers cost plus profit. In the first place, the mills' purchasing force must of necessity be large enough to take care of maximum demand, and would be idle during slack times. The dealers' organization, on the other hand, is flexible. When one market is dull, it concentrates on another. The purchasing force of the industrial consumer would learn also that it fails to render the proper service to the producer. Few consumers buy more than a half dozen grades. Scrap is produced in fifty or sixty grades. The dealers' organization handles all grades for the producer. The dealer also has a broader knowledge of all markets than the consumer could hope to gain. In a time of active demand, consumers, who are in reality competing against one another, must be reluctant to

*From an address before the National Association of Sheet and Tin Plate Manufacturers; Mr. Dreifus is president of Charles Dreifus Co., Pittsburgh.

give one another full information as to their respective markets. But such information is readily available to the dealers, through actual negotiations or transactions.

Storage Function of Scrap Dealer Activity

During periods of depression, after all consumers have filled their scrap storage space, the dealer continues to buy, prepare and store. This demand by the dealer keeps up to any extent the market for the producer The scrap stored finds its way to market when demand is active and prices higher, filling needs that could not be met by current production.

In going into these details of the scrap dealers' place in the commercial world, there has been no thought of holding a brief for him, but merely to explain why he is in business. If he did not fill an economic want, he would not be in business.

We must not close our eyes to the fact that scrap as produced is not all No. 1 heavy melting steel scrap, ¼ in. thick and heavier. There is a huge production of lighter and therefore less desirable grades for which an outlet must be provided.

Better preparation may make this scrap available for open hearth use, or the experience now being gained as a result of the present coke and pig iron shortage may prove that the blast furnace is the most practical outlet. It is certain that for economic reasons a continuing demand for these lighter grades must be stimulated, and a determined effort made to study the best methods to use them.

AMOUNT OF GASES IN STEEL

Results of Some New German Methods of Analysis on Basic Bessemer Metal

THE question of the kind and amount of gases contained in steel has always been of great interest, because of the possible large effect of these on the soundness, strength, and other properties of the steel. An important paper was published in *Stahl und Eisen*, May 25 by Oberhoffer and Piwowarsky of the Universities of Aachen and Breslau on their methods of investigation, and some very interesting results given.

Oberhoffer and his students had previously worked out an improved method of melting samples of steel in a vacuum, and measuring and analyzing the gases evolved, which is one method of attacking this problem. It is believed this method is liable to error, due to oxides in the steel reacting with the carbon and giving wrong values for CO and CO_2. Also the hydrogen in the steel may react with these metallic oxides to form water, which is absorbed by the P_2O_5 of the pump train of bulbs. A method was worked out of dissolving the steel drillings in mercuric chloride solution, the iron being changed to chloride and the gases set free. A detailed description of the apparatus used and the method is given in the original paper.

The first tests were carried out on a basic Bessemer low carbon steel, before and after de-oxidation. Results on the metal before de-oxidation by melting in a vacuum and also by solution in the cold by mercuric chloride, are given below as an average of 10 determinations. The amount of gas is cubic centimeters, at 0 deg. Cent. and 760 mm. pressure, per 100 grams metal. In regard to gas analysis the CO_2, CO, and H_2 were carefully determined and the nitrogen constituted the balance. The initials H.E. signify hot extraction, and K.U. the cold solution methods:

GASES IN BASIC BESSEMER STEEL

Before Deoxidation

Method	Total Gas, Cu. Cm.	CO_2, Per Cent	CO, Per Cent	H_2, Per Cent	N_2, Per Cent
H.E.	40.99	12.10	60.50	21.81	5.59
K.U.	9.23	18.75	16.25	44.98	20.02
After Deoxidation					
H.E.	102.96	9.00	62.75	22.05	6.20
K.U.	9.64	9.76	13.18	41.90	35.16

Results on a commercial soft steel containing carbon 0.15, manganese, 0.45, phosphorus, 0.025, and sulphur, 0.026 per cent, were as follows:

Method	Total Gas, Cu. Cm.	CO_2, Per Cent	CO, Per Cent	H_2, Per Cent	N_2, Per Cent
H.E.	118.93	1.9	75.3	19.9	3.4
K.U.	35.80	14.8	23.7	52.5	9.0

A comparison of results by the two methods shows first that the total amount of gas obtained by cold solution is only about 25 to 30 per cent of that found by the hot extraction method. This is understandable in regard to CO and CO_2, but it is noticeable that hydrogen also shows a marked decrease. This may be due to reaction between nascent hydrogen and the mercuric chloride with formation of free hydrochloric acid. A comparison of the results on the basic Bessemer steel before and after de-oxidation is very interesting. Further experiments were carried out on the 0.15 per cent carbon steel by both the methods mentioned above, and also by dissolving in cold bromine water so as to obviate the hydrogen reaction. The results were:

Method	Total Gas, Cu. Cm.	CO_2, Per Cent	CO, Per Cent	H_2, Per Cent
H.E.	114.8	2.0	77.83	20.17
K.U.	32.6	16.3	26.09	57.61
K.U. (bromine)	56.36	10.1	16.4	73.5

Tests were also carried out on an open-hearth steel of about 0.50 per cent carbon, before and after deoxidation, with the following results, the method being solution in cold bromine water:

Sample	Total Gas, Cu. Cm.	CO_2, Per Cent	CO, Per Cent	H_2, Per Cent
Before deoxidation	31.7	14.44	16.27	71.03
After deoxidation	40.5	7.15	10.60	82.25

G. B. W.

Proposed Aid for War Plants

WASHINGTON, Aug. 29.—Presentation of a report by Brigadier-General Williams, Chief of Ordnance, War Department, is being awaited by Secretary of War Weeks, before acting upon the proposal suggested to him recently by President Samuel Vauclain of the Baldwin Locomotive Works, that Government aid be given to industrial establishments created during the war to furnish munitions and other materials. Secretary Weeks told Mr. Vauclain that the question of aiding these plants was largely a matter of dollars and cents and would require Congressional authorization before the policy could be made effective. The Secretary did not commit himself one way or the other, but said that the proposal would be studied after the report of General Williams has been submitted. Mr. Vauclain is said to have told the Secretary that there are numerous plants created during the war whose maintenance in idleness during peace times represented a heavy cost to the owners who do not wish them destroyed, because of the high cost of building during war and the saving that would be effected and the immediate aid given to the Government in case of future emergencies. Secretary Weeks said that Mr. Vauclain did not ask help for the Baldwin company, but for another industrial enterprise with which he is associated as director. The Secretary stated that the Chief of Ordnance has been instructed to make an investigation of all large war plants which cannot be used during time of peace.

Metal Containers for Bolts and Nuts

Sheet iron containers for nuts, bolts and rivets, are preferred by Chilean importers, according to the Department of Commerce. They do not want shipments to come in wooden casks that break in handling. Europeans use the sheet iron containers and get the orders. One European firm recently got an order for 15 tons of rivets by cable because American concerns are disregarding instructions to ship in double bags of heavy material which, while not as good as sheet iron kegs, are vastly better than wooden containers. On one shipment 80 per cent of the wooden kegs burst when they were let over the ship's side into lighters, the contents were scattered over the floor and had to be shoveled into bags and later sorted out by hand.

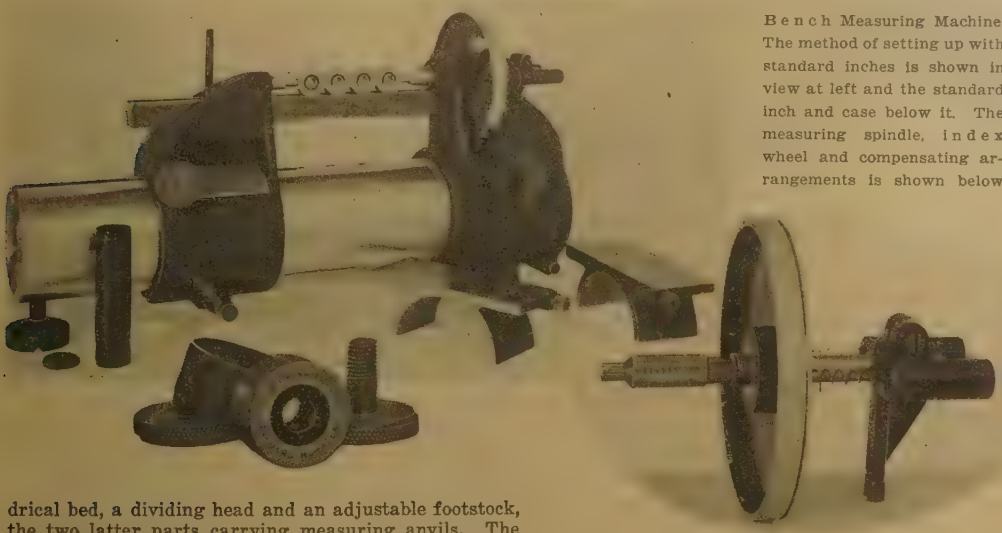
BENCH MEASURING MACHINE

Micrometer Accurate to One Ten-Thousandth of an Inch—Construction and Operation Outlined

A new bench measuring machine called the Supermicrometer which will give accurate measurements to the nearest ten-thousandth of an inch has been brought out by the Pratt & Whitney Co., Hartford.

The new machine is intended to cover the intermediate field between the ordinary micrometer measuring thousandths and the company's standard measuring machine, which subdivides ten-thousandths. It is rugged, simple and relatively inexpensive and is for use on the inspectors or toolmaker's bench by any workman of average skill.

The component parts, may be noted from the illustrations, the machine being made up of a rigid cylindrical bed, a dividing head and an adjustable footstock, the two latter parts carrying measuring anvils. The machine has a range of 8 in. between the anvils and 3¼ in. between anvils and table. It has three point support on the bench. The bed and the supports up to the measuring anvils are unusually rigid and give a firm, definite touch at the instant of contact with the work. Measurements can be repeated within close limits by the sense of touch alone.



Bench Measuring Machine. The method of setting up with standard inches is shown in view at left and the standard inch and case below it. The measuring spindle, index wheel and compensating arrangements is shown below

The setting of the machine is obtained by the use of standard inch blocks which are machine-lapped by a modification of the Hoke process and are accurate within five millionths of an inch. One of these blocks and its case is shown in the insert. The screw has a working range of ½ in. indicated by graduations on a forged Duralumin index wheel and on the measuring spindle. Means are provided to compensate for wear or any slight error in lead, while springs take up back lash and keep a constant pressure on the thrust bearing.

A square bar with a channel in one side is provided to hold the standard inches in place during the set-up or to serve as a work rest. This bar passes through the footstock and is mounted on a pin under the measuring spindle as shown in the illustration. It is conveniently stored in a hole in the bed when not in use.

The footstock is moved into position along the bed by a rack and pinion and may be clamped securely in place. Two tables are provided to clamp to the bed for supporting large work. The zero arm, held by friction, is adjustable to position and the knurled knob provides for fine adjustment of the zero line.

The index wheel has 500 divisions, 1/32 wide, each representing a spindle movement of 0.0001 in. These divisions are numbered at thousandths and are direct reading. The index wheel is revolved by a fine round belt, the slipping of which permits the operator to apply the same pressure each time to the measuring anvils. Variations in belt tension are said to not affect the accuracy of the readings, as the same pressure is applied when setting up to zero as when measuring the work.

The knurled handwheel has two diameters, the smaller for quickly spinning the spindle up to the work and the larger for the final slow movement to the point at which the belt slips. The spindle graduations are 0.050 in. apart, with etched figures at each 0.100 in.

Car Movement in Strike Times

The Matthew Addy Co., Cincinnati, under date Aug. 26, says of the strike situation:

"Week by week the effects of the coal and railroad strikes become cumulative—and this week there has been a frantic effort to keep plants going. It is not so much a question of the supply of raw materials, although these are very short, as it is a question of transportation. Things have been growing worse. The movement of freight is slow and the volume is small—and this is particularly true of the great trunk lines south of the Ohio River. They are jammed with loaded freight cars from beginning to end. Before the railroad strike, the L. & N. moved north in one day 1800 cars across its bridge into Cincinnati; yesterday it moved 800 cars, yet as illustrating the enormous expansion in business recently, the L. & N. before the war did not move to exceed 600 cars daily over the bridge. And the Southern's figures are in the same ratio. The C. & O. bridge had a movement before the strike of 4000 cars daily; yesterday it had 2400 cars—yet before the war it did not have to exceed 2000 cars daily—and even with strike conditions the movement of freight across the bridges is much greater now—more than double—than it was at this same time last year. So in spite of all the present difficulties business is being done on a large scale, but not in the volume that the needs of the country demand."

The Western Iron Stores Co., Milwaukee, Wis., dealer in machinists', mill and factory supplies, will add a line of machine tools to the products which it carries. The company has already been appointed representative for the Hoefer line of drilling machines, group drilling heads and drills.

In the reported negotiations over scrap supplies in South America, but at large amounts, the Hyman-Michaels Co., Chicago, is not interested, and Joseph Michaels, vice-president and treasurer of the company, says that it is not likely to be.

TO DISCUSS MANAGEMENT

Local Sections of Engineering Societies Plan Special Meetings for One Week—Topics of Practical Interest

The direction of labor so as to utilize constructive human abilities to the greatest extent is recognized as a fundamental function of management and the special meetings for management week, being planned by various local sections of the American Society of Mechanical Engineers and other societies, are expected in the relating of actual experiences to bring out facts of value to students of this subject.

Suggested topics for discussion include the following:

In what way does the management problem on a market of rising prices and activity differ from the management problem on a market of falling prices and inactivity? How is this difference being met by local business houses?

How is the manager using periodical statistics of production of basic commodities in shaping his own production policy?

Will profits average higher in the long run if reserves are established during periods of activity to carry operations at a loss during times of depression?

Where are the concrete illustrations of the reductions in cost of producing and of selling that have resulted from refinement of management methods? Do such refinements pay?

Will the period of intense competition ahead force industry to more thorough standardization of product, materials, equipment and processes? Will this benefit the worker as well as the investor?

Is it practical to make master plans for operations a year or eighteen months ahead? How and where has it been done?

Given a seasonal consumption of product, how do you determine when it pays to stabilize production by storing finished product made in dull season for sale during the season of active consumption?

Can participation in management by the worker ever be practical without his equal participation in responsibility? Can the former precede the latter?

Is the cost of living a practical basis for fixing wages under a condition of free competition for the product?

How can you measure definitely a man's ability as a manager? Is past performance a safe guide under new conditions?

How is the engineer helping the salesman?

The compilation in a special volume of the papers and discussions of management week is under consideration, and it is expected that every section will be represented.

Several sections have formulated plans. The relation of labor to national progress will be the topic about which discussion will center in the management week meeting of the New Haven branch of the Connecticut section of the American Society of Mechanical Engineers, to be held Oct. 16. It is expected that the subject will be treated not only in the broad sense indicated but also will be illuminated by discussions of concrete experiences of the local engineers and managers. The meeting will be under the direction of H. R. Westcott, president, Westcott & Mapes, Inc, New Haven, assisted by Prof. H. L. Seward, Yale University, and N. E. Horn, Winchester Arms Co.

The Metropolitan section will combine with the local sections of the Society of Industrial Engineers and the Taylor Society, the date of the meeting being Oct. 17. It is planned to invite the local representatives of manufacturing and financial interests to participate in the discussion of changes in management methods essential in the changing economic situation. A joint committee of six will be in charge of the meeting, the chairman being W. H. Leffingwell, president, Leffingwell-Ream Co., industrial engineers, New York.

New Orleans will hold its management week meeting in co-operation with the Louisiana Engineering Society. The leading paper will be on management of a ship-repair plant, to be presented by Orloff Henry.

The topic of Boston's management week meeting, which will be held Oct. 17, has not yet been decided. The Waterbury branch has also planned a meeting, the topic to be announced later. The meeting planned by the Hartford section will be in the hands of A. W. Honeywill, chairman of the local program committee.

A joint meeting with the Technology Club of Syracuse and local members of other national societies is planned by the Syracuse section.

Meeting of Lake Superior Mining Institute

The twenty-second annual meeting of the Lake Superior Mining Institute was held in the Michigan copper country the first three days of this week. Headquarters were at Houghton and a number of trips were taken. The Michigan College of Mines was visited Wednesday morning. The following papers were presented at the sessions on Monday and Tuesday evening:

"Co-operative Effort in the Study of Mining Methods," with an outline for papers on mining methods, compiled by the Mining Methods Committee of the American Institute of Mining and Metallurgical Engineers—Charles F. Jackson, secretary, Cleveland.

"Why We Need a Classification of Methods of Mining"—F. W. Sperr, Michigan College of Mines, Houghton, Mich.

"Calumet & Hecla Reclamation Plant"—C. Harry Benedict, Calumet, Mich.

"Handling Underground Waste Rock Through Underground Skip Dump, Quincy Mining Co."—T. C. DeSollar, Hancock, Mich.

"Recent Practice in the Use of Scrapers on Sub-Levels"—Lucien Eaton, superintendent Cleveland-Cliffs Iron Co., Ishpeming, Mich.

"Compond Steam Hoist Installation of the Quincy Mining Co."—Ray W. Armstrong, Hancock, Mich.

"Faulting on the Gogebic Range"—William O. Hotchkiss, State geologist of Wisconsin.

"Geology of the Eastern Menominee Range"—Major L. P. Barrett, mining geologist of Michigan.

"Pumping in East Vulcan Mine"—Frank H. Armstrong, Vulcan, Mich.

British Engineering Institutions Co-operating

It is announced that proposals for closer co-operation among the leading engineering institutions, which have recently been under consideration, have now received the approval of the Institution of Civil Engineers, Institution of Mechanical Engineers, Institution of Naval Architects and Institution of Electrical Engineers, and that an engineering joint council composed of representatives of these bodies has been formed.

The objects of the joint council will be, among others, to improve the status of engineers, to secure the better utilization of their services in the company's interests and the appointment of properly qualified individuals to responsible engineering positions, and to prevent unnecessary duplication of activities. At a later stage the number of bodies represented on the joint council may be increased.

COMING MEETINGS

September

American Engineering Council. Sept. 8 and 9. Executive board meeting, Boston. Report on three-shift day in industry. Secretary, L. W. Wallace, 719 Fifteeth Street, N. W., Washington.

Association of Iron and Steel Electrical Engineers. Sept. 11 to 15, inclusive. Annual convention, New Auditorium, Cleveland. Secretary, J. F. Kelly, 513 Empire Building, Pittsburgh.

National Exhibition of Chemical Industries. Sept. 11 to 16. Grand Central Palace, New York.

American Electrochemical Society. Sept. 21, 22 and 23. Fall meeting, Windsor Hotel, Montreal, Canada. Secretary, Dr. Colin G. Fink, Columbia University, New York.

American Institute of Mining and Metallurgical Engineers. Sept. 25 to 29. Pacific Coast meeting, Engineers' Club, San Francisco. Secretary, F. F. Sharpless, 29 West Thirty-ninth Street, New York.

Regeneratively Fired Heating Furnaces*

Conditions Necessary for Freeing the Hearth of Waste Gases—Good and Bad Examples—Krupp Not Infallible

BY W.-E. GROUME-GRJIMAILO

FURNACES of the Siemens or open-hearth type are symmetrical and the flues and ports through which the gas and air pass to the heating chamber serve also for the removal of the products of combustion. When regenerative heating furnaces are built, the head construction of the open-hearth melting furnace is frequently copied, although there is no necessity for such construction, and it is undesirable, when the difference in the purpose for which the heating furnace is employed is considered.

Nevertheless, this difference is a most essential factor in their design:

I.—The temperature to which the ingots are to be reheated for rolling or forging does not exceed 1300

Fig. 1. Regenerative Heating Furnace with Roof Like an Open-Hearth Furnace. The dotted lines at ends show how the roof was there lowered to get better and more uniform heating

deg. Cent. (2372 deg. Fahr.) and, for this reason, the jet of flame from the ports must not impinge upon the material being heated. In the open-hearth furnace this restriction does not exist and, on the contrary, it is desirable that the jet of flame should impinge upon the surface of the bath.

II.—The surface of the bath in the open-hearth melting furnace boils, which causes an elevation of the surface occasionally of from 20 to 24 in. (500 to 600 mm.). The surface of the hearth of the heating furnace is solid, except for the thin layer of melted cinder which slightly wets the surface. For this reason, in the open-hearth furnace it is absolutely necessary that the bridge or port sills should be at a level higher than the surface of the bath during the boil. But there is no reason that the ports of the heating surface should be higher than the hearth.

Actually, if the port sill or bridge of a reheating furnace is raised above the hearth level a height equal to the thickness of the ingots to be heated, as is ordinarily done, it becomes completely impossible to get rid of the layer of stagnant colder gases which lies upon the hearth and in which the material being heated is placed. It is evident that the heating of the material would be much better accomplished if this layer of colder gases were drained away from the hearth. To accomplish this result, the bridge wall or port sill should coincide with the hearth level.

Fig. 1 shows the longitudinal section of a curious regenerative fired furnace. The length of the hearth is 26 ft. 4 in. (8020 mm.); the roof is 3 ft. 3⅜ in. (1 meter) above the hearth and the width is 6 ft. 6¾ in. (2 meters). The heads are of the type usually used on melting furnaces. Originally the roof of the furnace was straight from end to end. Later it was lowered, in the neighborhood of the heads to 2 ft. 3 in. (680 mm.) above the hearth.

It is evident that, with a hearth 26 ft. 4 in. long, the hot gases from the flame did not touch the hearth of the furnace, and did not heat the material (ingots) near the waste gas outlet. This is the same phenomenon which occurs in the open-hearth melting furnace when, by reason of the complete absorption of the live force of the jet of flame, it rises to the roof and the thickness of the layer of hot gases becomes normal for its rate of flow, as may be computed by the formula of Yesmann. At the corner, close to the waste gas port, a pocket of colder gases will be formed, and the bath will tend to freeze. In the Goujon works, at Moscow, a case of this kind occurred, with a furnace 46 ft. (14 meters) long, and to correct this it was necessary to install two burners for oil, one in back of the other.

In the case under consideration, a different procedure was followed: that of dropping the roof of the furnace, close to the heads, to the height required for the inverted weir, forcing, in this manner, the stream of burning gases to lick the hearth, not only where it issued from the ports but also farther on. This is illustrated by dotted lines in Fig. 1. While estimating at its true value this method of reconstruction for the type of head universally in use, it is believed that much better results can be obtained in another way.

> *Note by translator:* Glass pot furnaces are a good example of this defective form of construction. Correct construction would undoubtedly eliminate a great many of the melting troubles experienced in the glass industry, as well as reduce the percentage of pot failures.

Figs. 2 and 3 are sketches of two forms of construction which may be employed for these cases. These two methods are based upon the following considerations:

The chilled gases are drawn off at the level of the hearth of the reheating furnace; this manner of getting

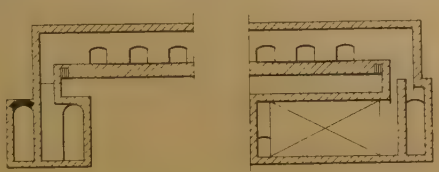


Fig. 2 (Left) and Fig. 3 Show Better Methods of Building Regenerative Heating Furnace Ends Than Given in Fig. 1

rid of the waste gases results in the active and regular action of the hot gases upon the material being heated, and favors their rapid and uniform reheating;

The producer gas, and the preheated air entering the heating chamber, do so at a very low velocity, to the end that combustion takes place throughout the entire heating chamber and the points of sharp combustion close to the ports, which occur in a jet of flame, are eliminated. When the gas and the air are preheated nearly to the temperature of the jet flame, which may be 1500 to 1600 deg. Cent. (2732 to 2912 deg. Fahr.) the material being heated will be burnt if exposed to the impinging action of a jet. This assumes that the producer gas and the air are mixed outside the heating chamber of the furnace.

To prevent the melted cinder from flowing into the ports of the furnace, the hearth is given a slight drain-

*From "The Flow of Gases in Furnaces," to be published by Wiley & Co., translated and copyrighted by A. D. Williams, P. O. Box 92, Newark, N. J.

age slope from both ends toward the center. The port sills or bridges are, moreover, cooled by inverted troughs of iron below them, through which a forced circulation of cold air is maintained by means of an aspirating chimney.

An extremely interesting example may be cited, from the point of view that the fundamental principles of rational furnace construction were completely neglected. This is a regenerative fired furnace for the carbonizing and tempering of armor plate according to the Krupp system.* This furnace is distinguished by the backward state which it shows in furnace construction.

According to Fig. 4, it may be seen that the vertical heads of the furnace are elevated 31.5 in. (800 mm.) above the hearth. The armor plate to be heated was

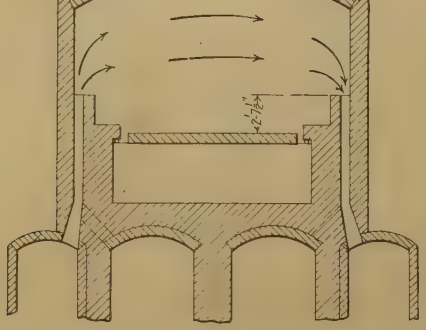


Fig. 4. An Armor-Plate Heating Furnace Which Was Not a Success

to be placed upon a car and supported above its deck by a short brick column, and then run into the furnace. It was found, nevertheless, to be within a pocket of colder gases, which could not be drained away from the armor plate. Moreover, the furnace was intended to work with a negative pressure in the heating chamber, with the result that the reheating of the plate had to be accomplished while it was surrounded with currents of colder air drawn into the furnace. The results of such a method of working are clearly apparent.

It had been planned to carbonize and heat two armor plates at a time, placing one above the other and separating them with a layer of charcoal. It may be stated that the lower plate was carbonized much more slowly than the upper; and it was necessary to abandon the idea of carbonizing two plates at a time. Actually, these plates were carbonized one by one, and double the number of furnaces were required with twice the expense of operation. Moreover, the Russian works were so thoroughly impressed by the reputation of the Krupp company that they would not consent to the cutting down of these heads to the level of the hearth of the furnace.

*This refers to the Russian works using the Krupp system.

Emergency Fuel

WASHINGTON, Aug. 29.—As an emergency fuel, a mixture of fuel oil with fine coal in as large proportions as the coal will absorb and hold is suggested by the United States Bureau of Mines to steam coal users and gas manufacturers to augment their fuel supply during the present shortage.

Slack coal that has a high percentage through an 8-mesh screen, or which may be crushed to sizes of ⅛-in. or less, will take up in oil from 30 to 40 per cent of its own weight and make a fuel high in calorific value. Coarse slack coal, however, as judged by a representative sample from the Pittsburgh market, will absorb oil to only 3 to 10 per cent of its own weight, which would give a fuel having only about 4 to 15 per cent increased heating value. The finer the size of the coal, therefore, the larger is the amount of oil which will be held. Tests made by the Bureau of Mines at Pittsburgh indicate that the mixture can be made with either bituminous slack or anthracite culm.

ROEBLING INSURANCE PLAN

Protection Given to 6,000 Families—Pension System Also Established

The John A. Roebling's Sons Co., Trenton, N. J., announces that all employees who have been with the company a year or longer, on Sept. 1, 1922, will be protected by group life insurance and pension plans. The insurance will go into force automatically at midnight of Aug. 31. The insurance is graded according to length of service, all employees more than one year and less than two years with the company to receive $500, increasing $100 for each additional year of service until the maximum of $1,500 is reached for 11 years and over. The insurance benefits will be payable to the beneficiary named by the employee, or, in the event of his becoming totally and permanently disabled before reaching age 60, it will be paid to him.

The pension plan contemplates retirement at 60 for men and at 55 for women, and in the event of 20 years' service or more, such an employee may request a pension or be retired at the discretion of the company. Any employee, however, who has served 30 years or more, or any male employee 55 years of age or female employee 50 years of age whose term of service is 25 years or more, may at the discretion of the company be retired from active service and granted a pension.

The plan also provides that pensions may be allowed in cases of total disability arising from non-occupational injuries and illnesses, provided the employee has served 15 years or more.

The amount of pension is determined by multiplying one per cent of the average annual pay during the ten years preceding retirement by each year of service. A minimum of $25 per month and a maximum of $250 a month has been established and will apply, except where the pension is being paid in cases of total disability above referred to, in which the minimum may be less than $25 per month.

Professor Stumpf Entertained

Prof. Johann Stumpf, Berlin, Germany, inventor of the Unaflow engine, who is making a tour of the United States, was the guest of Manager Neil C. Lamont, Laidlaw Works of the Worthington Pump & Machinery Corporation, Cincinnati, on Aug. 22. Mr. Lamont had invited the members of the American Society of Mechanical Engineers, Cincinnati branch, to meet at the plant for the purpose of inspecting the latest type of engines and compressors, and also to hear Professor Stumpf deliver an address on the latest developments in the Unaflow engine. Following an inspection of the shops and a number of engines in operation, dinner was served in the dining room at the plant, at which, in addition to the visiting engineers, officials and shop foremen of the company were present.

Professor Stumpf delivered an exceedingly interesting address, illustrated by lantern slides, paying particular attention to the results obtained in Unaflow locomotives now in operation on German and Russian railroads. Within the next few months Professor Stumpf expects to introduce the Unaflow principle into the automobile field in a new type of steam car.

Figures made public by the Pennsylvania Railroad indicate that a probable total of 137,250 tons of steel rails will be laid by that system this year, compared with a total of 149,765 tons in 1921. This estimate is based on figures for the first seven months of the current year, which show a total of 82,250 tons already laid down. Pennsylvania's commitments in the way of new rails have reached a total of 80,000 tons for 1922. With a carryover of 74,000 tons of rails from last year, the total available for replacements becomes about 154,000 tons.

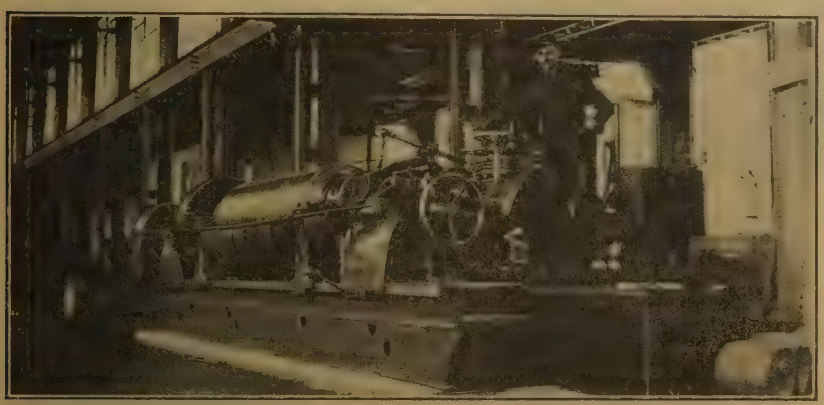
The Maine Central Railroad's Portland, Me., machine repair shop, air brake repair shop and other property were burned Sunday, Aug. 13, the approximate loss being $1,000,000. The shops will be rebuilt as quickly as possible.

New Machine for Grinding Mill Rolls

A heavy-duty roll-grinding machine for finishing all types of hot and cold mill rolls is being offered by the Landis Tool Co., Waynesboro, Pa. The general construction may be noted from the accompanying illustration which shows the 40 x 168 in. machine in use at one of the plants of the Aluminum Co. of America finishing a 16,000 lb. roll.

The machine is driven by three motors and is entirely self contained. It is stated that under actual operating conditions the machine has removed 7 cu. in. per min. of chilled iron, accuracy and sensitiveness being maintained throughout. The standard sizes available are 20, 30 and 40 in. and in lengths to suit requirements.

The work is driven by a motor which is mounted on the bed of the machine and connected directly to the headstock. A motor mounted on a carriage and traveling on a track at the back of the machine is used for driving the grinding wheel, and a small motor is provided to drive the water pump. The motors are controlled by push buttons on the operator's platform.



New Roll Grinding Machine. The operator's platform is on the grinding wheel carriage. The two-bearing type of roll head is shown above

To permit the operator a clear view of the wheel and work at the point of contact, the operator's platform is mounted on the grinding wheel carriage. The carriage-traverse and reversing mechanism is embodied in one unit which is mounted on the grinding-wheel carriage within convenient reach of the operator. Gears are of chrome-nickel steel and run in oil. For smooth operation, the main drive on the grinding-wheel carriage is through a worm and rack, and provision has been made for a tarry at the point of reversal. Power movement on the grinding wheel base permits rapid moving of the wheel toward and away from the work.

A special feature is the attachment provided for grinding the face of the roll either concave, convex or straight as desired. The amount of crown or concavity is obtained by a simple system of gearing at the back of the machine and can easily be determined by a chart provided for the purpose. The gearing is engaged or disengaged by means of a lever on the operator's platform.

The roll supports are of the two bearing type which permits grinding the journal without changing the position of the roll, thereby getting the body of the roll and the journal concentric, which is essential, particularly on rolls used in the cold rolling of thin metal to close limits. The bearing block in the roll supports are made adjustable to accommodate journals of varying diameters.

Leather belting sales are reported by the Leather Belting Exchange, Forrest Building, Philadelphia, as having amounted for July to $779,951. This compares with $721,037 for June and $548,290 for July, 1921. The reports represent about 60 per cent of the total product of the industry. The increase over June is 8.2 per cent; over July, last year, 42.2 per cent.

Fewer Metal Workers and Lower Wages

Iron and steel plants, according to figures of the Bureau of Labor Statistics, show for July a loss from June of 1316 employees in 108 establishments. This loss of 0.9 per cent was accompanied by a loss of 11.8 per cent in amount of payroll and a corresponding reduction in the average pay envelope from $46.78 to $41.67, or 10.9 per cent.

In the automobile industry there was a gain in 40 establishments of 1.6 per cent in number of employees, but a reduction of 1.1 per cent in payroll total. In car building and repairing there was a loss of only 7.8 per cent in number of employees in 54 establishments, in spite of the strike, and a loss of 40.1 per cent in amount of payroll.

Compared with a year ago, there has been a gain, all told, of 32.2 per cent in number of men employed, and a gain of 22.9 per cent in total payroll. This connotes a loss of 7 per cent in contents of the average pay envelope.

Wages per half-month per man in automobile plants, which are exceptionally busy, are 63 per cent over those prevailing in steel plants. Details are shown in the table.

Period	Number of Establishments	Number of Men	Half-Month Payroll	Average Pay Envelope
Iron and Steel				
June, 1922.....	108	142,652	$6,673,450	$46.78
July, 1922.....	108	141,336	5,889,278	41.67
July, 1921.....	110	98,537	3,772,352	38.29
*Automobiles**				
June, 1922.....	40	104,889	7,377,743	70.34
July, 1922.....	40	106,619	7,243,249	67.95
July, 1921.....	42	89,714	6,280,330	70.00
Car Building and Repairing				
June, 1922.....	54	51,699	3,071,000	59.39
July, 1922.....	54	47,661	1,838,207	38.57
July, 1921.....	56	40,067	2,351,014	58.68
Metal Workers (the three groups above)				
June, 1922.....	202	299,250	17,122,193	57.21
July, 1922.....	202	295,616	14,970,734	50.64
July, 1921.....	208	228,318	12,403,696	54.33

*Payroll figures are reported as "weekly"; they have been made "half-monthly" by multiplying by 2 1/6.

Canada's Iron and Steel Output in July

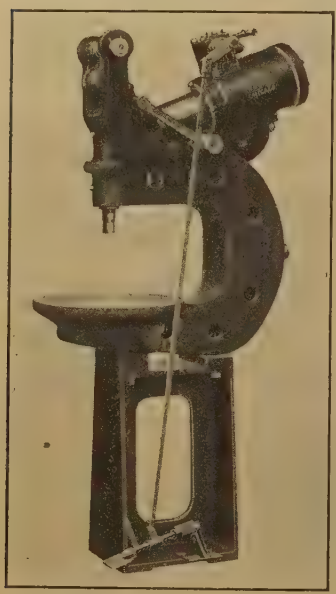
The production of pig iron in Canada during July presented an increase of 10.2 per cent over the record for June. The output during July was 31,705 tons as compared with 28,763 tons in June. The production of steel during July showed a surprising advance. The output in June was 32,805 tons while in July the production amounted to 62,767 tons, constituting an increase of 91 per cent.

A new electro-graphitic brush, known as No. 259, has been developed by the National Carbon Co., Inc., Long Island City, New York. It is stated that tests made on direct current motors and generators have showed the brush adapted to a wide range of voltages, current densities and speeds.

General Utility Pneumatic Press

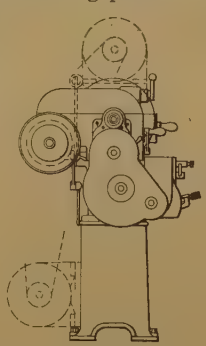
Of particular interest perhaps to makers of heat-treated gears, forgings and automobile parts, and for use in packing carbonizing material in pots around parts to be case hardened, is the press shown in the illustration, a recent development of the Hanna Engineering Works, 1765 Elston Avenue, Chicago.

The machine is designed as a general utility press and is operated by compressed air or steam. Various forms of platens, tables or work-supporting structures may be used, making it adaptable to straightening, bending, forcing, marking, embossing, forging, briquetting, multiple-riveting and similar operations. Ten sizes, from 15 to 200 tons, are available.



General Utility Pneumatic Press

The power mechanism is that used on the company's riveters and the manipulation of the operating valve is by hand or foot. The length of the die stroke is variable and no more than the rated pressure is exerted by the die regardless of where the die travel stops. The connecting mechanism between the die and the actuating air piston is a combination of toggle and lever. The air piston while traveling at a uniform speed imparts to the die a gradually decreasing speed and increasing pressure relative to the movement and pressure of the piston during the first portion of its stroke and at substantially uniform speed and pressure, also in substantially uniform relation to the movement of the piston during the last portion of its stroke. The first portion of the die stroke, or increasing-pressure stroke, is from 1½ to 4⅝ in. long, according to the rating of the machine. The last portion of the die stroke, or uniform-pressure stroke, is from ⅜ to 1⅛ in. long. The die is mounted on an adjusting screw.



It is emphasized that the press is particularly adaptable in bending and straightening operations, since the pressure on the die only builds up as the air pressure builds up on the piston. By throttling the air and bringing the pressure up slowly, just sufficient pressure may be brought on the work to deflect it the desired amount, the pressure then being released.

If the die travel is stopped by the resistance of the work at any point within the uniform pressure stroke, which is anywhere beyond half the piston stroke, the pressure on the die is a known predetermined amount in direct proportion to the air-line pressure. The line air pressure is controllable by a regulating valve to within 5 per cent.

In marking, embossing and forging exact uniformity of results is said to be obtainable because just the proper amount of pressure for each requirement is available regardless of the minipulation of the operating valve or the variation in thickness of stock within the limits of the length of the uniform pressure stroke, ⅜ to 1⅛ in.

The floor space required is comparatively small and the machine is portable in the sense that it can be moved without moving any auxiliary equipment.

Chicago Mill Strikes Ended

CHICAGO, Aug. 26.—The strike at the rail steel bar mills of the Inland Steel Co. and the Calumet Steel Co. at Chicago Heights, Ill., has been settled by granting the demands of the men for a 20 per cent increase in wages. This action was taken by the companies following the announcement of an advance of 20 per cent in the wages of common labor by the United States Steel Corporation. The strike has been in effect since Aug. 7.

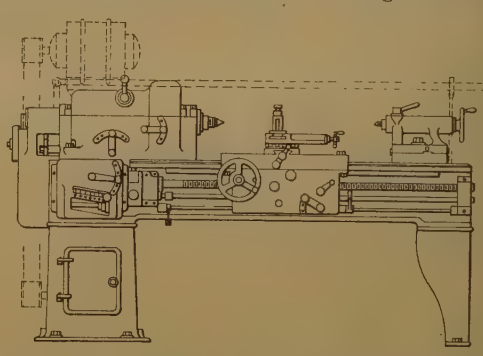
New Line of Geared-Head Engine Lathes

A new line of geared-head lathes in sizes from 16 to 30 in. has been placed on the market by the Cincinnati Lathe & Tool Co., Cincinnati.

The machines are equipped for either belt or motor drive, the direct-connected motor-driven lathes being provided with either chain or belt drive with idler pulley. When equipped for single-pulley belt drive from the line shaft, a rod as shown on top of the lathe, or a handle at the front of the head are provided for starting and stopping. If required apron control is supplied. The motor may be mounted on the headstock or at rear of the cabinet leg.

Surplus power is a feature emphasized by the makers, it being claimed that all sizes develop approximately double the horsepower, size for size, of the usual design. The 16-in. lathe will develop a high pulling torque of 9.2 hp. with 56 lb. per in. of effective belt pull. The 22-in. geared head lathe is said to develop 15 hp.

The disk clutch with brake provided has a neutral position, which disconnects the spindle from the gearing, removing the fly wheel effect of the heavy gears on the spindle. This feature is intended to save time while centering irregular work in a chuck or in the machining of smaller parts where chucking time is a large factor. Twelve spindle speeds are available, these being conveniently manipulated by the three handles shown in the front of the head. The range of the 16 in. lathe illustrated is from 13.5 to 400 r.p.m., in geometrical progression. The full range of these changes is said to be made in 12 seconds.



Gear-Head Engine Lathe Arranged for Belt or Direct Motor Drive. Either the rod at top or handle at front is furnished for starting or stopping

As an example of the wide adaptability of the new machines for general shop conditions, the 16-in. machine shown is stated to machine work at full swing of the lathe at a cut speed of 55½ ft. per min. Smaller work can be machined at similarly economical speeds, ½-in. work for instance being operated at 54 ft. per min.

The M. S. Little Mfg. Co., 151 New Park Avenue, Hartford, Conn., and the A. J. Beaton Mfg. Co., New Britain, Conn., plumbing and heating supplies, are to merge. Full details will not be available until next month, when stockholders vote on the consolidation. Present plans call for the moving of the New Britain company's equipment to Hartford.

Progress in Human Relations in Industry†

Wages Not the Only Factor in Making Men Contented —Mistakes in Employee Representation Plans

BY R. H. WEITZEL*

RELATIONS between employers and employees in future are of greater moment and of more profound significance in their influence upon the future life of the nation than any other one matter which concerns us to-day. The proper solution of these problems depends upon the success with which the management on the one hand and the worker on the other are able to view each other's position with reasonableness.

The happenings of the last few months are likely to give the impression that high wages are all that is necessary to keep men in industry satisfied and contented. However, those of us who have had to handle the details of any considerable operation in industry know that this is a mistake. We are all wage earners, whether we work for day's wages or for a salary, and we all know how much easier it is to be happy on comparatively small pay, even though the work is very hard, if other things in connection with our employment are satisfactory.

We have all seen men leave their jobs for one offering higher pay, and soon be anxious to return to the old job at the old pay, and to work for the old boss. Satisfactory living and working conditions are of the utmost importance, but the "boss" is, after all, the big factor. The laborer is not any different in this respect from the clerk, foreman, superintendent or manager. All of us measure the value of our jobs to a larger extent than we realize by the relationships we sustain with our immediate superiors.

Representative Plans

Up until perhaps ten years ago, thousands of employees in industry had never seen an officer of the company except those connected with the local management, and had no means by which they could take up a grievance except with their foremen and through their own individual efforts. Many thousands of them now have representatives, chosen by themselves, who can, when they think it necessary, take up any matter concerning their employment or living conditions with higher officers of the management, and feel confident of receiving sympathetic consideration.

This new method of dealing with employees was such a radical departure from what had been the practice for so many years that naturally a great many mistakes were made, and the most common mistake, to my mind, was that the machinery employed failed to consider the foreman. The plan usually provided for a meeting of the officers of the company with the representatives of the employees without the foremen being present.

The Foreman's Position

The foreman had been trained to feel that his authority was supreme; he hired or fired as he pleased, and made his own rules of discipline and enforced them. He suddenly found that his subordinates had a way of going around him or over his head, and I think sometimes the management was inclined to listen to one side of the story and form judgments before hearing what the foreman had to say. Much better results would have been obtained at the start if the foreman had been called in and had explained to him the necessity for the change, and had an effort been made to get his sympathetic co-operation. This mistake, I think, has been to a large extent corrected, and the foremen have been made to see the justice of the new arrangement, and are now working sympathetically with the new methods. It is obvious that little real progress can be made except with the hearty co-operation of the foreman. He is really the most important link in the chain of industrial management.

To my mind, the modern industrial organization is similar, in many respects, to a modern central power plant, with a generating station, step-up transformers, transmission lines, step-down transformers, low tension lines, controllers and motors. The president, or board of directors, represent the central station. They devise and initiate the policy. The policy may be of the very highest character, and the officials may have the highest aims and ideals, just as the power plant may have the best boilers, the best fuel, good water, good draft, and efficient engines and generators, but if the transmission line is weak, has too small copper or poor joints, the voltage will not be delivered to the step-down transformers at the point of operation. If the connection between the president and the operating people is weak and has not a good transformer, the operating official will not be imbued with the spirit at headquarters. Lack of co-operation between managers and superintendents, or between superintendents and foremen corresponds to bad joints in the transmission line. You may have capable men, just as you may have good wire of sufficient size, but if they are not hooked together properly and do not co-operate, you will have the same result as you get from a poor joint on the transmission line. The foreman represents the controller. Very often a controller is put in in an emergency, and is too small to carry the current necessary. The result is that it heats up and burns out. All the other factors from the plant, through the transmission line, transformers, and up to the controller may be perfect, and if the controller has poor contacts, or is too small, the motor will not operate properly. There may be men of the highest type, from the president down, they may all co-operate, but if the foreman who has the direct control of the labor is too light for the job, or heats up too quickly, the operation will be poor.

Selection of Foremen

The foremen have been receiving a great deal of attention in the last few years, and very properly so. In addition to this, the managers and superintendents are paying a great deal more attention to the character of men they select for foremen. In former years the principal qualifications for a foreman were that he be a good hustler and have a knowledge of the work to be done. In fact, not so many years ago I believe foremen were selected for their driving qualities. We still need the foremen with knowledge of the work and plenty of initiative and hustling ability, but we now feel that we need a foreman who is a leader rather than a driver. The foreman's position is perhaps the most difficult in all the chain of industrial management. Besides having the initiative, energy, skill and executive ability, to be successful to-day, he must be patient, tactful, considerate, thoughtful, and above all, honest, friendly and sympathetic. What cannot the foreman accomplish who is able to impress his subordinates with the feeling that he is always ready to assist the incompetent with advice, to overlook small and unintentional mistakes, to talk over with them their small difficulties, whether connected with the work or outside their employment?

I know that many believe that only the sternest discipline will produce results and that any unbending on the part of a superior tends to produce inefficiency. I am sure, however, that no greater fallacy exists.

*General manager Colorado Fuel & Iron Co., Pueblo. Col.

†From an address at a conference on human relations in industry held at Estes Park, Col., July 28-30.

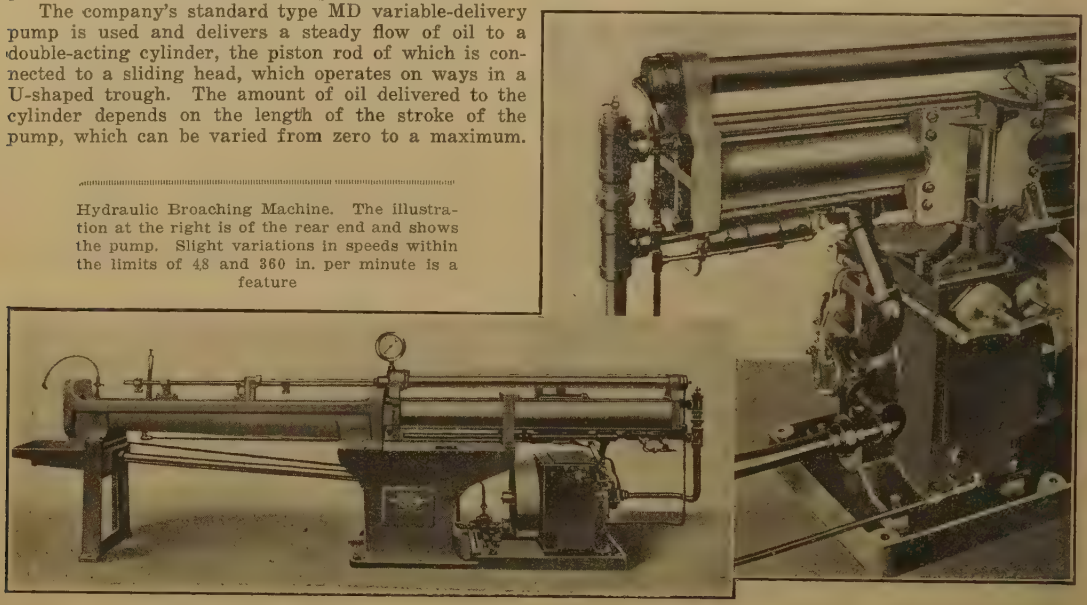
HIGH-SPEED BROACHING UNIT

Increased Production Claimed for New Hydraulic Machine—Features Described

Increased production ranging from 75 to 200 per cent over the usual type of single or double-pull broaching equipment is claimed for the new hydraulic broaching machine illustrated, a product of the Oilgear Co., Milwaukee. The features underlying the increased output include the higher speed available, 360 in. per min. maximum; practically unlimited choice of speeds; and the automatic control of the cutting and return strokes, entirely independent of each other. Decreased unit labor cost and lower unit power cost are also claimed.

As an example of the efficiency of the machine, the production figures of the work of broaching four solid keys in a differential gear, 1¼ in. bore by 2 in. long, and of 0.22 carbon steel are given. The cutting speed was 288 in. per min. and the return speed, 312 in. There were two broaches in the set and the draws per hour were said to average 145. The maximum horsepower used was 5½ for a cutting time of 6½ sec.

The company's standard type MD variable-delivery pump is used and delivers a steady flow of oil to a double-acting cylinder, the piston rod of which is connected to a sliding head, which operates on ways in a U-shaped trough. The amount of oil delivered to the cylinder depends on the length of the stroke of the pump, which can be varied from zero to a maximum.



Hydraulic Broaching Machine. The illustration at the right is of the rear end and shows the pump. Slight variations in speeds within the limits of 48 and 360 in. per minute is a feature

The speed of the piston travel being dependent on the amount of the oil pumped into the cylinder, this speed can be changed at will by changing the stroke of the pump. It is emphasized that it is this method of controlling the speed, together with the even flow of oil delivered by this type of pump, that makes it possible to use higher speeds than usual. The cutting stroke is started without shock and the pull is steady. The choice of speed within the limits of 48 in. and 360 in. per min. is practically unlimited for either the cutting or return stroke and slight variations are easily obtainable. This range permits selection of correct speeds for different materials and broaches.

The speed of the return stroke is adjustable independently of that selected for the cutting stroke. Automatic stops are provided; these being set for any desired length of stroke and the stroke remaining fixed. Reversal of the machine is by simply pressing a push button, the control being also set for automatic reversing. An emergency lever is provided for stopping the machine instantly at any point of the stroke. Quick-acting relief valves intended to prevent the pulling apart or the buckling of a broach are provided. One of the valves is mounted on the cutting end and another on the return end. They automatically relieve the pressure and stop the machine when the pressure builds up to a predetermined point.

The machine is driven by vertical belts from the line shaft or motor, the latter being mounted above the main cylinder on an adjustable support. The pulling capacity is 16,000 lb., equivalent to that required by a 2-in. square broach, and the stroke 56 in. The diameter of the hole in the face plate is 5 in. and the vertical adjustment of the drawhead 1⅝ in. above and below center. A 10 hp. motor is used. The floor space occupied is 26 in. by 16 ft., and the weight of the machine 2900 lb., net.

Orders for Locomotive Castings

SPRINGFIELD, Ohio, Aug. 29.—An order to furnish castings for 45 locomotives booked by the Lima Locomotive Works was secured Friday by the Ohio Steel Foundry Co., which has plants in Springfield and Lima. The locomotives are to be built for the Missouri, Kansas & Texas Railroad Co. During the past 60 days, the company has been awarded orders for locomotive castings for 180 engines, including the order just received. The Springfield and Lima plants will be rushed with work for months. Substantial orders for miscellaneous castings for agricultural and motor truck companies are being received. Indications are that the force at the Springfield plant will soon be increased. At present 200 men are employed.

The Lima plant of the Ohio Steel Foundry Co. has been running full time for the last seven months. The Springfield plant has also been speeding up. The Lima plant turns out heavy castings and the Springfield works makes the light castings. The company is equipped to handle the business coming to it. The only handicap at present is the scarcity of material. Owing to the strike some rolling mills cannot furnish steel.

High Cost of Strikes

Although industrial disputes in Pennsylvania in the first six months of this year numbered only 257, outside the coal, railroad and printing strikes, a very favorable showing as compared with any of the past four years, the loss in wages greatly exceeds that of any of these years, according to a report by the bureau of mediation and arbitration, Pennsylvania Department of Labor and Industry. For the first six months of the year, strikers in Pennsylvania lost in wages a total of $117,546,466, this being exclusive of the railroad shopmen's strike, which did not begin until the end of the period. Striking coal miners are estimated to have lost a total of $114,502,914. Adding the further losses since June 30 makes a total approaching $200,000,000. In 1921, in 1210 labor disputes, the strikers lost in wages $38,375,104.

Call for Higher German Export Duties

Great Increase in Home Demand—Exports Confined Largely to Highly Finished Products—Labor Scarcity—Discarding 8-Hour Day

BERLIN, GERMANY, Aug. 9.—The question facing producers is the shortage of fuel and skilled labor. For the first time on record the Steel Syndicate has twice raised its prices with only an eight days interval. The agitation for reintroduction of compulsory maximum prices (abolished in April, 1921) for Steel Syndicate products continues. (The Berlin cable of Aug. 20, published in THE IRON AGE of Aug. 24, page 492, reported the rejection of the proposal by the Iron Trade Association.) The complaint of consumers is that the syndicate is exploiting the general scarcity in order to raise its rates more than is justified by the rise in production cost.

Exporters' profits in marks have been greatly increased by the sudden exchange collapse; and the Government, with aim of getting some of the extra profits for the public, has submitted to the Reichswirtschaftsrat a bill doubling the export duties on iron and steel. These duties are mostly around 6 per cent and on no goods do they exceed 10 per cent. Exporters and various bodies, including the German Trade and Industry Congress, are opposing the bill, declaring that a system of rigid export duties, which cannot be rapidly adapted to varying exchange conditions, must fail. For heavy iron and steel the export duty question is not important, as the scarcity is so great that imports actually exceeded exports in recent months.

The prices of finished metal goods, machinery, electro-technical plant, etc., are far below world market level at present exchange. The *Frankfurter Zeitung's* index for Aug. 1 shows that the mark prices of finished goods average 85½ fold more than in 1914. At the mark's present gold exchange of around 200 to 1, gold prices of finished goods are therefore less than half those of 1914; and a heavy export duty could be levied without danger of causing under-selling by foreign competitors. As instance, the latest standard price of the best quality full-sized German typewriters, corresponding in ambitions if not in quality to the dearest American machines, is only 20,000 marks (or at exchange of 800 m. only $25 and at 1200 m. nearer $17).

The shortage of pig iron is acute. Lack of coke in July caused some smelting works to reduce output, and the use by other works of dear English fuel was a factor making for higher prices.

The home demand for semi-finished material is enormous; and foreign demand, though small, cannot be satisfied. In railroad permanent way material, the works are behindhand with their orders for the State, and the private demand for light and mine rails cannot be met. In early July, export was checked by the fact that German prices had about reached foreign levels, and after the new mark drop changed this, the home demand grew so enormously that there is practically an embargo on export. One cause here is a sudden revival of building. Bars and girders are in great demand; and the supply has long been inadequate. Even in exports the last monthly trade report shows exports of only 40,780 metric tons of these rolled products against imports of 51,220 tons. The same is true of tubes, of which exports were 4950 tons against 16,971 tons imports.

The increasing tendency is to consume the relatively cheap heavy and semi-finished metal in home manufacturing, and to export high-priced machines and other highly finished goods. This policy is leading to an ever greater insufficiency of skilled labor. The number of unemployed on July 1, 1920, was 322,923; on July 1, 1921, it was 314,475, and on July 1, 1922, 19,864. The last figure is about one-fourth of the normal unemployment in good pre-war years. Reports from Westphalia show that the 8-hr. day is being increasingly broken in the heavy metal branches. The Upper Provincial Court of Cologne has decided on appeal that violation of the 8-hr. law by employers is not punishable if the employees are consenting parties.

New iron ore fields have been discovered at Wolfenbuettel in Brunswick, and a concession to mine has been granted. Ore prices have risen rapidly, Siegerland Rostspat being now 1922 m. per metric ton, as against 750 m. at end of 1921 and 19½ m. in 1914. The Mannesmann Tubes Co. has absorbed the Bergwerks A. G. Consolidation. The Association of Electro-Technical Concerns reports that Germany in this branch has lost her pre-war rank of leading exporter. In 1913, the order was Germany, England, United States, France and Switzerland. The present order is United States, England, Germany, France and Switzerland. In 1913 Germany's exports were 52 per cent of those of all five, England's 22 per cent, and the United States' 16 per cent; in 1921 the United States' proportion was 40 per cent, England's 28 per cent, and Germany's 21 per cent. Former enemy countries exclude German electrical products, and some of the former neutrals have imposed customs barriers and import prohibitions. The monthly value of German electrical exports in 1921 averaged 12,000,000 gold marks against 30,000,000 gold marks in 1913.

GERMAN INDUSTRIAL STANDARDS

Their Spread and Their Impression on Import Countries—American Engineer's Report

"The day may not be far distant when American manufacturers will receive inquiries from oversea countries to furnish goods according to the German national standards, and it behooves us to plan in time to meet such conditions."

This statement is contained in a communication to the American Engineering Standards Committee from Oscar R. Wikander, an American engineer, who has just returned from Germany, where he represented the committee in conferences concerning the international standardization of ball bearings. Describing the great strides in standardization that have been made by German industries during the last few years and the important foreign trade advantages accruing to German industries because of their intense standardization activities, Mr. Wikander said:

There is no doubt that one of the main reasons why forward-looking Germans force their standardization work is because they want to introduce German standards in the great importing countries, and possibly in the whole world. Many European countries follow the German lead very closely. The great German deliveries in kind to France will no doubt be made as far as feasible according to German standards, thereby introducing them in that country.

It was only a few years ago that the "Normenausschuss der Deutschen Industrie," an organization corresponding to our American Engineering Standards Committee, was formed but the amount of work which it has already accomplished is stupendous. It has already issued several hundred sheets of approved standards, and about twice as many are already published as proposed standards. By personal investigation I found that the great output of standards was merely due to the enormous efforts put forth and to the enthusiasm of the great majority of the interested parties.

This enthusiasm is due to a more or less general recognition of the great economic value of standardization, and to the very generally accepted opinion that a standardized industry would be one of the strongest weapons in Germany's struggle for economic rehabilitation and financial reconstruction.

To give a concrete illustration: At the time of my visit, a syndicate of 19 German manufacturers and one Swedish

manufacturer were executing an order for 700 locomotives for Russia, all of the same design, and every part in every one of them was being made interchangeable with the corresponding part in all the others, all parts having been manufactured to the same fits and tolerances. This feature will have the great advantage of permitting the Russian railroads to use any disabled locomotive as a store of spare parts for all the others. It is easy to realize what great advantages German manufacturers of locomotives will have over those of other nations when competing on the basis of such specifications, and this example illustrates the economic advantage which can be gained by German industry in introducing its standards in all countries importing mechanical equipment.

Another error in our conception of German standardization is the belief that the 'Normenausschuss" is autocratic in its methods and is not in as close contact with the industries as our own standardizing bodies. I found, on the contrary, that absolutely the same methods are used there as here to arrive at national standards. It is a large organization, built up along the same lines as the American Engineering Standards Committee. Its personnel consists of the same high grade type of men, only there are more of them and their work is greatly facilitated on account of the eager response from the German industry, whose leaders look to standardization as one of their greatest hopes for salvation.

It was proposed that they should send to the American Engineering Standards Committee all the drafts of any importance submitted to their own committees for consideration, so as to make it possible for them to obtain American comments on important propositions, which might be of value in making final decisions. It was also suggested that the American Engineering Standards Committee keep the "Normenausschuss" posted on its more important work. England seems to have realized fully the importance of recognition of her standards, and is trying to force the adoption of them in her colonies and dominions.

In conclusion, I hope that the example of the German engineers and manufacturers may spur us to make equally large contributions in work and money to the cause of standardization, and that our leading engineers may try to realize the enormous economic importance of both national and international standards.

FRENCH MARKET IMPROVED

Price Tendency Is Upward—Exports Aided by Strikes in United States—The Blast Furnace Status

(*Special Correspondence*)

PARIS, Aug. 17.—The iron and steel market is showing a real improvement. Inland markets are affected and prices are firm, with a rising tendency. But the improvement has been caused principally by the progress of exports, favored by the rise of British currency; strikes in the United States, which permit French and Belgian producers to supplement decreasing American supplies in export markets; also the extreme instability of the German mark, which prevents German producers from booking forward orders.

On June 30, of the 220 blast furnaces in France, 91 were in blast (2 less than on May 31). The following shows the situation in Lorraine on Aug. 11:

	Total Furnaces	In Blast
de Wendel	18	13
Hagondange	6	4
Knutange	10	5
Rombas	8	6
Terres Rouges		
Audun-le-Tiche	4	2
Ottanges	3	1
Redange-Dilling	3	0
Thionville		
Société Lorraine Minière et Metallurgique	4	2
Uckange		
Aciéries de Nord et Lorraine	6	2

During the first six months of 1922, France produced 2,261,000 tons of pig iron and 2,045,000 tons of steel.

Iron Ore.—On Aug. 9 the French Railway Board increased from 15 per cent to 25 per cent the previous reduction on rail transportation rates for exported iron ore. The prior reduction of 5 per cent for full trainloads of 180 tons and more has been supplemented by a reduction of 4 per cent on shipments of 120 to 180 tons. A revision of the whole rate schedule will be made in October.

Coke.—The adjusted price of German reparations coke delivered to French blast furnaces will be maintained for September at 97 fr., at the frontier.

Pig Iron.—Foundry iron is slightly firmer. The current price is 205 to 210 fr.

Negotiations for the renewal of the Comptoir des Fontes Hématites have failed, and the Comptoir stands dissolved as from Aug. 31. The dissolution of the Comptoir des Fontes Hématites is generally deplored, as was the dissolution, last year, of the Comptoir des Fontes phosphoreuses de Longwy, to which may be attributed the bad state of the pig iron market.

British East Coast hematite, mixed numbers, at 90s. f.o.b. (about 250 fr.), is now selling in French Northern ports at 310 to 320 fr.

Semi-Finished Steel.—Prices are unchanged, but the inland demand has improved and prices of billets and flat bars show a rising tendency. Deliveries are from eight to ten weeks.

Works in the North of France are considering delay in relighting their blast furnaces, and operation of their rolling mills on semi-finished steel products purchased in Lorraine. It is reported that one company in Meurthe-et-Moselle is purchasing semi-finished products in Lorraine.

Beams.—The situation is quiet but the volume of business satisfactory. The price, f.o.b. Antwerp, now quoted for export is 385 to 390 fr. (Belgian), or 365 to 370 fr. (French). Some small tonnages have been booked by French works, notably for India.

Rails.—The French railroads have not yet allocated their orders for rails. Lorraine works have taken orders for mine rails in France and in Germany.

Rolled Merchant Products.—The demand for rolled merchant products has improved and prices are rising. The basis price is now 430 to 440 fr. in the East and in Lorraine. A good demand for angles is reported, and the Cie. du Chemin de Fer d'Orléans has placed an order for angles (used in electrification work) at 395 fr.

Sheets.—The situation in the sheet market is improving. Orders in August are better than in July, which was a better month than June. No advance in price has been indicated by the Comptoir des Tôles, but the concession formerly made on light sheets to induce purchasers to buy ahead has been discontinued. British offers of sheets are appearing again in the import market.

Steel Wire.—Prices are firmer at 460 to 480 francs.

Castings.—Previous improvement continues but prices are low. Recently a Western foundry booked an order for *coussinets* from the French State Railways at 445 fr.

Scrap.—The following prices are now quoted per metric ton, on truck at selling works:

	Fr.
Machinery scrap	200
Cast-iron scrap	150
Turnings	130

British Steel Exports and Imports in July

British exports of iron and steel in July, according to a cable to *Commerce Reports*, were 251,743 gross tons, a considerable improvement over those for June which were 236,298 tons but less than those in May at 272,437 tons. Imports in July were 55,893 tons as compared with 52,775 tons in June and 60,939 tons in May.

Aluminum producing firms in England have been asked to supply Bulgaria with enough aluminum to produce coins of 1 and 2 leva denominations to the total nominal value of 60,000,000 leva. This is in connection with a new law permitting the use of aluminum for this purpose. At normal exchange the lev is valued at 19.3c.; at present, however, $1 will purchase about 150 leva.

Detroit Does Not Take Gloomy View

Some Manufacturers Are Hopeful Despite Announcement of Plan to Close Ford Plants—Coal Being Delivered to Foundries More Freely

DETROIT, Aug. 28.—Despite the announcement last Saturday of the plan for closing the Ford plants, Detroit is not in a gloomy condition. The distinct impression is that the whole truth in regard to the reason for the Ford announcement has not been told. Other manufacturers are of the opinion that conditions are improving to a moderate extent. Coal is being more freely received by leading dealers and deliveries to foundries are more satisfactory. There is a chance for decided improvement in a few weeks.

The Ford Announcement

The Ford Motor Co. announced that its three local plants, Highland Park, River Rouge and Lincoln Motor, would close Sept. 16. By that time, according to Mr. Ford's view, with coal receipts continuing at their present rate, its reserve stocks would be exhausted and it would have on hand only sufficient fuel to bank its one active blast furnace and keep its coke ovens warm. In making the announcement, Henry Ford said this decision was arrived at because his companies "were confronted by the situation that, under the present handling of coal, there would never be a time when they would have sufficient coal to operate the several departments of the plants simultaneously. Of necessity, therefore, they must close down sooner or later. We wish to keep enough coal to keep our furnaces and coke ovens warm: to let them get cold would cause us a loss of hundreds of thousands of dollars."

Shipments Suspended

Mr. Ford further announced that notices to suspend shipment had been sent out by telegraph to nearly 2000 concerns supplying his companies with materials and parts. In the local Ford plants, probably 55,000 men are now employed, turning out about 5200 cars per day, while the assembling plants in various parts of the country employ some 30,000 additional.

This announcement followed several curtailment steps calculated to stretch the Ford coal supply to the limit. Two or three months ago, shipments of pig iron to concerns making Ford parts were either reduced to the exact tonnages required or were cut off completely, and two weeks ago all outside shipments of both coke and pig iron were discontinued. Announcement was then made Wednesday that the tractor plant would close, and Saturday the decision was reached to close the entire three plants.

In the face of this announcement, it is interesting to note that, as a whole, Detroit industries have held their own through August, with employment near the maximum for the year.

This is shown by the Employers' Association report. The end of the first week in August bore all the earmarks of the beginning of a decline in employment where the figures dropped from 183,000 to 181,000 during this second week, but were regained during the third week and present figures are approximately at the peak of the year, or 183,000. These figures do not yet include the retrenchment at the River Rouge tractor plant of the Ford Motor Co., where from 3000 to 6000 men were notified of an indefinite suspension of operation on Wednesday, Aug. 22. The Ford Tractor Co. has accordingly withheld shipments of castings and other material for tractor assembly.

Pig Iron Distribution Curtailed

Priority measures within the Ford Company have likewise curtailed the distribution of pig iron to their outside sources for castings. Consequently, there has been a rush of these melters to cover on pig iron requirements and this has had the effect of bringing in iron from unusual sources.

Probably on an average the public utilities companies are no worse off for fuel than they were two or three weeks ago. The week was marked by a particularly acrimonious exchange of courtesies between State Fuel Administrator William W. Potter and Federal Administrator H. B. Spencer. A disturbing factor of the week was a scarcity of open top equipment, due to the mandate of the Interstate Commerce Commission that this equipment be returned to the mines empty. There has been some scarcity of box and automobile cars for some time past, so that this will be an added incentive to greater "drive-aways" from the automobile plants. The Saginaw district mines are getting into production, but their normal markets are within a 100-mile radius and Michigan as a whole depends on outside sources for its fuel.

The automobile industry, particularly in the lighter cars, while not at the year's peak of production, has not shown the usual and predicted seasonal slump. In numerous cases, production is hampered by lack of raw and assembling materials, sheets being a determining factor. Manufacturers have been unable to get their quota of sheets even where they are protected by several sources of supply on this material, due to the fact that many of the sheet manufacturers do not produce their own steel.

Dissension Among Unions in Connellsville Region

UNIONTOWN, PA., Aug. 28.—Posting of notices of the Sept. 1, 1920, scale, the highest ever paid in the Connellsville bituminous region, injected a new situation into the Connellsville bituminous strike last week. The H. C. Frick Coke Co. posted the notices of the wage increase late Tuesday evening, and this action was followed by the posting of similar notices at the independent plants on Wednesday morning.

The posting of these notices was the signal for meetings at practically every plant throughout the region at which the strikers discussed the new wage situation. The last half of the week saw no great increase in return of strikers to places in the pits but observers are watching with interest developments during this week.

The afternoon the new wage scale was posted, union leaders were meeting delegates from each of the new union locals at a convention held at Brownsville Junction. This meeting developed that there is a decided split in the union ranks with a large element of the men desiring to return to work. The fight came over the adoption of a resolution approving the wage agreement at Cleveland, one faction here opposing the approval because the agreement was not national in its scope. While the resolution was finally ratified, it was not without a fight and with indications that a break is more than likely in the union ranks.

Older employees of the region are leading in the agitation for acceptance of the new wage scale and return to work. The principal agitation for a fight to the finish is led by the union organizers and the younger workers in the region.

The action of the Frick company and independents in posting the new wage scales at this time came as a complete surprise. Observers did not expect a break in the strikers' ranks the past week, but are looking for some drastic changes during the next ten days. As a matter of fact quite a few of the strikers in the region

have returned to work already, but not in large numbers. Importation of men continues into the region and the production is being increased rapidly. The older workers who are on strike realize that the new wage scale is a lure for men in other mining regions and that unless they return soon all their places will be filled by outside workers. As a matter of fact, a number of men from union fields are coming into the region.

The new scale here averages slightly higher than the union scale and in addition the workers have the advantage of paying no union dues and better working conditions than exist in the union fields.

Coal and coke shipments are showing big gains throughout the regions, new records having been set by railroads each succeeding day this week. Shipments on Friday are indicative of the production and were 1166 coal cars and 290 coke cars. Daily average shipments over the Baltimore & Ohio for the Smithfield district during the week were 184 cars, considered above normal. There has been an increase in shipments over the entire Baltimore & Ohio Connellsville region lines. For the week ending Aug. 19, there was an increase of 300 cars over the preceding week which increased 500 cars over the week preceding that. A high water mark also was reached last week in river shipments of coal and coke. On Friday 26,400 tons or 464 cars of coal and 1709 tons or 36 cars of coke passed through Lock No. 5 on the Monongahela River at Brownsville.

Transportation Problems in Valleys More Serious

YOUNGSTOWN, Aug. 28.—The transportation situation is growing more serious in its effects on the industry. A sheet producer reports that it is shipping four-fifths of its output in bad order cars. Another company has been shipping some sheets in open top equipment, covering them as much as possible. One interest is using stock cars occasionally for the shipment of nails.

Car shortage is expected to prove more of an impediment to the industry as coal movement increases. Occasionally refrigerator cars are being employed in shipping tin plate. Leaders in the industry, such as President James A. Campbell of the Youngstown Sheet & Tube Co., do not believe better than 50 per cent operations are possible before the close of lake navigation.

Coal supply is still wofully inadequate, though the output is increasing and the outlook in this respect, as viewed by Valley executives, is much brighter than it has been. Prices are receding to between $5.50 and $6, at the mines, for coking coal, but these are still regarded as out of line by industrial consumers in this territory, who are making little effort to buy in a large way.

Inbound coal shipments for one large Valley producer last week varied from six to 10 carloads per day, whereas its normal consumption averages 135 cars daily.

Valley interests have posted notices at their Pennsylvania coal mines, re-establishing the Sept. 1, 1920, wage scale, but as yet there has been little response on the part of the men. In the non-union fields, it is claimed that the wage issue has now become secondary to the demand of the men for recognition of the unions. Steel companies in this territory operate their mines either non-union or open shop.

Independents which have provided housing facilities for their miners have as yet made no attempt at eviction of the men and their families. One such interest, though, is planning a move in this direction, unless the men display a desire to return to work. It is felt that the approach of cold weather and the urge for funds will prompt many of the workers, who have now been idle for nearly five months, to resume digging at an early date.

In view of the improved outlook, a number of interests are tentatively sounding out the market for coke supplies, among them the Trumbull-Cliffs Furnace Co., the Sharon Steel Hoop Co. and the Struthers Furnace Co., whose stacks are idle. Blast furnace coke now ranges from $12 to $13 per ton, against a recent high of $15.

No surplus pig iron is available in this territory. The $35 quotation still rules in a nominal way on semi-finished material, but all Valley interests are out of the market. Non-integrated rollers are still getting sufficient supplies to enable them to maintain operations at a normal rate. One such interest was promised 1000 tons during the week by a Valley producer.

Price advances covering the semi-finished market will probably apply on fourth quarter business. The practice is to adjust prices on such contract business quarterly.

Contractors Protest Against Coal Order

WASHINGTON, Aug. 29.—Hearing granted by the Interstate Commerce Commission last Friday to the Associated General Contractors of America on their application for the elimination of the fifth or "all other purposes" classification of priorities for coal in Car Service Order No. 23 was attended by representatives of the iron and steel, lumber, and coal industries, but they did not participate in the proceedings. Iron and steel and lumber interests have shown an interest in the proposal because they are included in the fifth classification, which the Associated Contractors maintain is superfluous. The Associated Contractors contend that it is necessary to speed up the movement of building materials.

The only witness was R. C. Marshall, general manager of the Associated Contractors. In the course of the hearing, lasting less than one hour, Mr. Marshall submitted figures to justify the claim that unless the order was changed so as to provide coal other than for uses specified in the four preferred classes of priority, construction operations would shut down. He admitted that there would not be enough cars for loading all the coal offered, but contended that no preference for coal loading should be given for anything other than that intended in the four preferred classes.

Commissioner Aitchison, in charge of the hearing, who is a member of the Federal Fuel Distributing Committee, wanted to hear from industries on the subject of the service orders in order to be prepared to change them quickly if conditions warranted such action, but it was intimated that there would be no further formal hearings regarding the question. It was indicated by Commissioner Aitchison that more formal hearings would not be helpful because the law authorizes the commission to act without holding hearings.

Independent Production Very Low

YOUNGSTOWN, Aug. 29.—Curtailment of iron and steel production in the Mahoning and Shenango Valleys is reaching to finishing lines in a more decisive way. The Brier Hill Steel Co. is operating its by-product coke oven department at 30 per cent, while the Youngstown Sheet & Tube Co. has but one battery of six on the active list. Thirteen tin plate mills at the plant of the Trumbull Steel Co. are inactive.

Independent iron and steel production is virtually at the lowest rate this year. No Bessemer steel is being produced by independents, and the number of active open hearths has been reduced to 30, of 51. Only three independent blast furnaces are operating, though the Shenango Furnace Co. planned to put its No. 1 stack at Sharpsville in blast.

This furnace will supply hot metal to the Valley Mold & Iron Corporation, supplying ingot molds to Valley open-hearth departments.

Bar production is negligible, as only one unit is

scheduled at the plant of the Republic Iron & Steel Co., for three days' production. The company's plate mill was placed on the active list for the same period.

Skelp rolling has been reduced to one mill each at the plants of the Republic and Sheet & Tube companies.

A shortage of semi-finished steel is cutting heavily into the time of rolling crews on blooming and bar mills. In at least two plants, rolling mill crews are working only five and six hours on a 12-hr. turn.

A gain of one pipe furnace over last week brings the total number of operating mills to 14, of 17, in the Mahoning Valley.

Fabricators are slowing down in some departments, due to inability to get steel and depletion of stocks.

Increased Production of Coal

WASHINGTON, Aug. 29. — An output of at least 6,000,000 tons for the week of Aug. 21-26, the twenty-first since the strike began, was assured by reports for Monday, Tuesday and Wednesday, the Geological Survey states in its weekly report on coal production, but additional tonnage from other districts that have signed the Cleveland agreement may raise the total to 6,250,000 tons. Production of anthracite remains practically zero. The increase in production was chiefly in central Pennsylvania, western Pennsylvania, the Fairmont and Panhandle districts of West Virginia and Ohio. In these districts collectively the daily rate of production exceeded by 156,000 tons, or 130 per cent, that of the week before. The increase in central Pennsylvania was about 90 per cent; in western Pennsylvania, 40 per cent; in northwest Virginia, about 170 per cent, and in Ohio, 115 per cent. Even with an output of 6,250,000 tons of bituminous coal a week, production is greatly below normal. In the corresponding period of 1921, production totaled 9,640,000 tons, of which 7,750,000 tons was bituminous. The year before that, the total raised was 13,250,000 tons. In comparison with these figures, the output last week was from 4,000,000 to 6,000,000 tons short.

Few Operators Oppose the Cleveland Surrender

PITTSBURGH, Aug. 28.—Crumbling of the opposition by union coal operators to signing the Cleveland agreement continues in this district and while companies representing a large tonnage remain obdurate, the belief prevails that many of them will abandon their stand during the coming week and go along with those which have signed. An interesting development over the week end has been the acceptance of the Cleveland agreement by the Midvale Steel & Ordnance Co. and the Lackawanna Steel Co. The Vesta Coal Co., the Jones & Laughlin Steel Co. subsidiary, resumed operations to-day in five of its mines, while six of the operations of the Union Coal & Coke Co., the Midvale Steel & Ordnance Co. subsidiary, reopened, and also three mines of the Ellsworth Collieries Co., owned by the Lackawanna Steel Co. Resumption at the Jones & Laughlin mines should have immediate effect upon the blast furnace and steel works operations of that company, since its mines are located on the Monongahela River and it can bring down practically all of its production by water and thus avoid interference from priority regulations, to which rail shipments are likely to be subject.

Some Conditions Worse

But while the situation with regard to hitherto union mines is improving, the situation in the Connellsville district, hitherto non-union, if anything, is worse than it has been. The announcement a week ago by H. C. Frick Coke Co. restoring the Sept. 1, 1921 scale, effective Aug. 23, instead of leading to a return to work on the part of its men, seems to have increased their inclination to stay out until this and other companies sign an agreement with the union. The union organizers have told the men that the re-establishment of the 1920 scale is the result of the union efforts and that only by remaining out until the Frick Company and others in the Connellsville district recognize the union, will the advantage gained be safeguarded. Since the great bulk of the operators in the Connellsville district are opposed to recognition of the union, it begins to look as though the trouble in that district would be rather long drawn out and a general resumption of the mine and coke oven operations is not near at hand.

The Priority System

Setting up the machinery for carrying out of the priority system is making rather slow progress, at least so far as actual results are concerned. The Pennsylvania Fuel Commission, at meetings last week, set up "fair" prices and named regional directors, but so far as actual control over shipments goes, the market still is an open one and coal is going where the price is highest without much regard to preferential consumers. The "fair" prices set up by the Pennsylvania authorities are $3.75 per net ton at mines for thick vein and easily mined coal and $4.50 for thin vein coal, which is more costly to get out. These prices are to govern on interstate shipments, but it is believed they eventually will also apply on intrastate business. Brokerage commissions are limited to 25c. per ton regardless of the number of hands through which a sale passes. In other words, thick vein coal sold through brokers must go to the consumer at not more than $4 at the mine and thin vein coal at not more than $4.75 at the mine. The market, however, still is far above these levels.

Will Go Ahead with Clairton By-Products Coke Plant

PITTSBURGH, Aug. 28.—The Carnegie Steel Co. has definitely decided to go ahead with the addition to its Clairton, Pa., by-product plant and has just signed a contract with Koppers Co., Pittsburgh, for 366 by-product coke ovens, together with auxiliary plants. This addition will bring the total number of ovens at this plant to 1134, having a carbonizing capacity of 21,500 tons of coal a day. The plant as it now stands consists of 768 ovens and has a carbonizing capacity of 13,000 tons of coal daily, or about 17 tons per oven per day. In the 366 ovens to be built, 8500 tons of coal can be carbonized daily, an average of more than 23 tons per oven per day.

The new ovens are of a design recently perfected by the Koppers Co. and are of a combination type, so arranged that they may be heated with producer or blast furnace gas, releasing all of the coke oven gas for use in the steel mills. Improved quality of coke produced, making possible more economical blast furnace practice by reducing the consumption of coke per ton of pig iron produced, faster coking time, giving greater capacity per oven per day and stronger construction are the principal advantages claimed for this new type of oven, the inventor of which is Joseph Becker, consulting engineer, Koppers Co. An experimental battery of these new ovens has been in operation at the plant of the Koppers Co. in Chicago for the past year with remarkable results as regards speed of coking and the quality of the coke produced.

Furnaces will be installed by the Weldless Tube Co., Wooster, Ohio, in its new seamless tube plant from designs Buell, Schieb, Mueller, Inc., Pittsburgh, which designed and is supervising the installation of two furnaces for the Fort Pitt Spring & Mfg. Co., at McKees Rocks, Pa.

PRICES RISE, OUTPUT LESS

Slackening in Production Due to Labor Troubles—Decline in Building Contracts

Under the above title, the Department of Commerce summarizes the industrial situation in the advance sheets of its monthly "Survey of Current Business." The slackening of industrial output, while partly seasonal, is attributed chiefly to labor troubles, resulting in scarcity of fuel supplies and in difficulties in transportation. With the accumulating shortage of many commodities prices have risen at an increased rate, most notably in coal, animal products, cotton and sugar. Wholesale prices in general in July were higher than at any time since February, 1921, and were 12 per cent higher than those of last January.

Stocks of merchant pig iron declined to the lowest point reached since September, 1920, being 245,000 gross tons at the end of July, compared with 702,000 tons one year previous. Receipts and shipments of both lead and zinc declined, though zinc production, at 63,854,000 lb., made a higher record than for any month since the close of 1920.

Bituminous coal production in July was 5,000,000 tons less than in June. Compared with 1921, the accumulated deficit for seven months has reached 20,000,000 tons. The corresponding anthracite deficit reached almost 30,000,000 tons, production of 161,000 tons in July being only 2 per cent of normal. Gasoline production in June made a new high record, at 525,941,000 gal., more than 12,000,000 gal. above May—the previous high record.

Car loadings declined in July to an average of 828,029 per week, compared with 851,700 in June, most of the loss being in coal loadings. The number of surplus cars in good order July 31 was reported at 174,927, the lowest, except when a strike threatened last fall, since the end of 1920. Shortage of cars, at 24,973, was the highest since the end of 1920.

Building contracts let in July declined 9,000,000 sq. ft. from June, to 51,705,000 sq. ft., the lowest figure since April. The four months, however, constitute a high record of construction activity. Building costs continued to rise. Brick and lumber production declined, but cement made a new high record.

Cotton consumption in July was the lowest since one year ago. Consumption of raw silk and bank clearings also declined, due in part to seasonal influences.

PLANT OPERATIONS

New England Manufacturers of Some Products Report Improvement

New England manufacturers of grinding machines are busier than they have been before this year, but not all of them are back on a normal basis. The demand for abrasive wheels, on the other hand, shows decided improvement. The Norton Co., Worcester, Mass., is employing 2100, of which 1850 are in the wheel division. In the recent business depression the number of employees was down to 1200. Abrasive wheel makers in Waltham, Mass., and at other New England points also are employing more people in an effort to keep up with incoming business.

Steel plants in the Cincinnati district are maintaining their customary schedules of operations, although the difficulties in the way of transportation are reported to be growing. The American Rolling Mill Co. is operating at capacity at both Middletown and Zanesville works, with the Ashland plant on a 50 per cent basis. The Andrews Steel Co., Newport, Ky., facing a shortage of basic iron, is nevertheless maintaining operations on a 70 per cent basis, while the Whitaker-Glessner Co. at Portsmouth is running at its schedule of last week, and from present indications will continue to do so for some time.

The Wilson Foundry & Machine Co., Pontiac, Mich., a subsidiary of the Willys-Overland Co., is advancing production of automobile engines to a basis of 300 complete motors daily.

The New Jersey Zinc Co., Palmerton, Pa., is increasing production to a capacity basis in practically all departments at its local plant, giving employment to a full working force on full-time schedule.

The American Car & Foundry Co., Berwick, Pa., has resumed operations at the puddle mill at its local plant, following a shut down for about a month. The finishing mill, also recently closed, has been reopened. A full working force will be employed.

E. I. du Pont de Nemours & Co., Wilmington, Del., are arranging for the resumption of production at its Ashburn Works, near Hannibal, Mo., used for high explosives. The mill has been closed for about a year past.

The Remington Typewriter Co., Syracuse, N. Y., has resumed operations at its local plant, following a two weeks' shut down. Manufacture of portable typewriters will be maintained on a basis of 1800 complete machines per week.

The J. G. Brill Co., Philadelphia, has increased production at its local car works to about 60 per cent of capacity, as compared with a 50 per cent operating basis two months ago, and 25 per cent of normal the early part of the year.

The Hudson Motor Co., and the Essex Motor Co., Detroit, affiliated, have increased production to a basis of 300 complete automobiles per day, and will maintain this schedule for an indefinite period.

The Wallingford Steel Co., Wallingford, Conn., a new organization, capitalized at $200,000, has completed the erection of a local plant and plans to commence operations by the close of the month. The works will be devoted to the production of cold rolled steel products.

The Kelly & Jones Co., Greensburg, Pa., manufacturer of valves, pipe, etc., has closed its plant temporarily owing to a strike of employees. The men have asked for an increased wage scale. The plant has been employing about 1400 operatives.

The United States Lock & Hardware Works, Columbia, Pa., is developing capacity operations at its plant, following a return to work of employees, recently out on strike.

The Willys-Overland Co., Toledo, Ohio, has established a production basis of 750 automobiles a day at its plants, about 175 of which are being equipped with Knight motors. Employment is being given to about 10,000 men.

The strike of laborers at the plant of the H. B. Smith Co., Westfield, Mass., heating appliances, has ended following a conference between the company officials, its employees and a business men's committee, recently formed to end the controversy. The strike was called May 1, as a result of an announcement of a reduction in wages. The molders' union was not involved in the dispute, but was thrown out of employment by the action of unskilled help. The plant employs something more than 1000 workers.

Production was recently started at the newly completed Youngstown plant of the Paul J. Kalman Co., Chicago, fabricating interest. It will manufacture steel reinforcing materials, largely for construction purposes. The company plans to erect an additional unit at the Youngstown plant next spring. Capacity of the plant is now about 100 tons daily.

Arundel Cotter's book, "United States Steel—a Corporation with a Soul," has been translated into Japanese and copies of the Japanese edition, which closely resemble in binding the last American edition, have been received in this country. All the illustrations accompanying the original text have been reproduced in the Japanese edition.

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The Advance in Steel Works Wages

The 20 per cent wage advance made by the Steel Corporation and in turn by the independent producers is not the result of prosperity that has come to the steel industry. The balance sheets of all steel companies for the first half of the year, especially those of the independent companies, few of which have earned dividends in that period, are sufficiently convincing on that point. Steel works common labor has been scarce since mid-spring and even on a 70 to 75 per cent operation in steel it has been difficult to maintain working forces, since other employments for common labor were paying more than 30 cents an hour. Four months ago it was recorded in these columns that in the Chicago district steel companies had had some difficulty in securing labor for some classes of work, and in the intervening weeks repeated references have been made in our market review to the higher labor costs that might have to be reckoned with as the year advanced. On May 25, three months ago, THE IRON AGE said: "There is no great hope in the steel industry of freight reductions sufficient to make a marked change in costs for 1922. On the other hand are the prospect of fairly high fuel and of possible labor shortage and higher wages."

Newspaper writers whose comments in the past week have treated the 20 per cent wage advance at steel works as a surprise, or as springing from some hidden motive, simply confess that they have not been alive to the labor situation as it has been developing in the past three months. There has been much shifting from one employment to another in that period, particularly in the Central West. What has happened at many plants, in the drawing of workers to higher priced jobs in automobile works at Detroit, is well known. No executives are better versed than those in the steel industry in the effect of the existing immigration act on the supply of "fetch-and-carry" labor, the kind that is in demand at steel works. The advance in common labor from 30 cents to 36 cents an hour simply recognized the fact that the supply of such labor has not been equal to the demand at some Central Western plants, and that public work and other outdoor employment had established a level which steel companies would have to meet.

The steel companies simply met the situation. With non-union coal mines announcing advances averaging more than 40 per cent on the heels of the Cleveland agreement, there is little point to the criticism that the steel companies' 20 per cent advance was "unfortunate" on the eve of the hearing at Chicago in the case of the railroad maintenance of way workers. The steel companies did not do the choosing when some of their leading products went to a 1.30-cent basis last spring. Supply and demand did that, and steel company balances have been written in red at the same time that railroad car orders and steel building contracts have been putting large tonnages on rolling mill books. The steel trade, through no will of its own, was simply illustrating the old Carnegie maxim that the way to lift the market is to get under it. Prices went below the cost line, the mills grew busier, and better times would have been well on the way ere this but for the bitter conflicts in coal and transportation.

The effects on steel consumption of the "victory" of the union coal miners, the unavoidable advance in steel works wages, and the scarcity prices for fuel that will be a factor in iron and steel making costs for months are another story. Apart from war time, the country has never known a sustained demand for steel on a 2-cent market or anything approaching that level. To-day it is obvious that 2 cents for plates, shapes and bars would mean a loss for not a few of even the larger producers—companies whose statements for the third quarter of the year will show that again they have failed of making a profit. And after railroad work and building and oil development and automobile manufacture have been stimulated by 1.30-cent steel, how far can the stimulation be carried with steel prices $15 to $20 a ton higher?

The steady foreign demand for American copper is still a prominent feature of our export trade. Its magnitude is a surprise even to those in closest touch with events in copper. The statistics show that shipments abroad for the fiscal year ending with June exceeded all post-war records, even the heavy movement in 1921. The actual figures are 677,487,300 pounds as compared with 596,117,247 pounds in the calendar year 1921. A continuing surprise is the heavy buying by Germany, despite the fall of the mark to a line's width from zero. At

33.7 per cent of the total, exports to Germany exceed even the large buying in 1913 when stocks were being accumulated for war. Buying by France is also unprecedented at 16.6 per cent of the total. And in the last six months Japan has increased her takings to 13 per cent of the total, against 9.9 per cent in 1921. All these records are significant of the well-nigh indispensable place of the ancient metal in the world's work and also of its historic capacity for doing the unexpected.

Steel Capacity and Orders

In the annual statistical report of the American Iron and Steel Institute, issued recently, information is given as to rated capacity of steel works. The ingot capacity—disregarding castings—is as follows for Dec. 31, 1921, in gross tons per annum:

Open-hearth	42,066,110
Bessemer	12,830,400
Crucible	189,380
Electric	731,395
Miscellaneous	400
Total	55,817,685

The question is what allowance should be made for possible excess rating, to determine the practical capacity. Actual experience alone can be the guide. The last year in which there was full operation was 1916, ingot production being 41,401,917 tons. The compiled capacity was 43,822,600 tons at the beginning and 47,585,395 tons at the end of the year. Taking the mean of these as representing the average during the year and dividing into the actual production gives 91 per cent, as the relation of output to compiled capacity. As a check on this conclusion the experience of 1913 may be taken. It was commonly taken then that production was about 90 per cent of full operation. The statistical report did not give capacity at the beginning of 1913 but gave 37,933,475 tons for capacity at the close. The Annual Review Number of THE IRON AGE, Jan. 1, 1914, gave the new capacity completed during the year at 2,900,000 tons. Deducting one-half of this gives 36,500,000 tons as the average rated capacity during the year. Production was 30,280,130 tons. Assuming that this was 90 per cent of what would have been made if orders had not begun playing out in the late months of the year, the actual capacity averaged 33,600,000 tons during the year, which is 92 per cent of the compiled capacity, this agreeing quite well with the factor of 91 per cent found by the experience of 1916.

Applying the 92 per cent factor to the compiled capacity at the beginning of the present year gives 51,350,000 tons, and applying 91 per cent gives 50,750,000 tons as the actual practical capacity.

It is, however, well recognized that in present circumstances the steel industry, no matter how well supplied with orders, cannot produce 50,000,000 tons of ingots in a year. That is, it cannot function as it did function in 1916 and in 1913, or, it may be added, in practically all its history prior to half a dozen years ago. In the first nine months of 1920 the industry strained every nerve to produce, yet made ingots only at the rate of about 42,000,000 tons a year. It was hampered, at one time or another, by fuel shortage, labor shortage, labor inefficiency and transportation shortage.

It is not a gratifying situation. It is a new thing for the steel industry to be unable to operate freely when it has the orders. Until six years ago the industry had only two troubles, more or less recurrent—inability to sell steel up to its capacity and inability to obtain remunerative prices. When demand was equal to capacity fair prices were obtained and the good years evened up for the bad years. We are in a new era. Before the war a 50 per cent operation was considered almost indescribably bad, profits being quite impossible. Now the industry is operating at but little more than 50 per cent, and prices are mounting rapidly.

Verging on Revolution

Governor Miller of New York is a man of courage, a man of conviction and he knows how to use the English language. In his message to the special session of the Legislature, last Monday evening, he painted a vivid picture of the pending industrial disputes, which, he said, are impairing transportation and the production of both anthracite and bituminous coal, and threatening the paralysis of industry as well as widespread distress next winter from shortage of domestic fuel. Then the Governor added:

> A nation-wide industrial dispute involving essential industries verges on revolution, and in fact is the method advocated by those who plot revolution, of whom there are still, unfortunately, too many in this country. Such a dispute, irrespective of its merits, is revolutionary because it subordinates the general interest to the selfish interests of a few. It is subversive of free government because it subjects all the people to the tyranny of a few, and a Government established to promote the general welfare cannot tolerate the tyranny of any interest, group or individual and endure.

These are strong words and should cause every patriotic American, not only of the State of New York but throughout the Union, to stop and think. They should appeal especially to well-meaning people who in the past have been apologists for men like William Z. Foster. The New York *Times*, speaking of the new charges against Foster, observes that "the evidence to be presented would be of interest to the committee of nine clergymen, including three bishops, who gave the authority of their names to the Interchurch World report on the steel strike, which—though with somewhat greater subtlety and address—glossed over Foster's past and that of his fellow-organizer, John Fitzpatrick."

Then the *Times* calls attention to the little red book, "The Syndicalist," an almost forgotten revolutionary pamphlet written by Foster and another radical, dug up in September, 1919, by THE IRON AGE, which published liberal extracts showing Foster's revolutionary teachings. Foster did not then repudiate his extreme views, and only recently, in a friendly periodical, he asserts that the American working class is not moving fast enough, declaring that what is needed in this country is to adopt methods used in foreign countries—above all to arouse the militants to stop the open shop drive. "The fate of the American labor movement," said Foster, "depends upon whether or not the militants and others in the ranks arouse themselves to action."

It is high time for the people in this country,

whether heretofore they have been apologists for the radicals or not, to aline themselves against the militants, within and without the unions.

Uneven Tax Burdens

According to a statement made public Aug. 27 by the United States Commissioner of Internal Revenue, residents of New York State paid 25 per cent of the total of all taxes collected by his office and 25 per cent of the total income and profits taxes, during the fiscal year 1922. Details from the statement show that New York, New England, New Jersey and Pennsylvania paid income and profits taxes amounting to $1,039,088,000, against $1,033,912,000 for the other 39 States and the District of Columbia. The respective populations, 1920 census, were 29,662,000 and 76,049,000. The tax collections per head were $35.03 and $13.60—nearly three to one.

Apportionment of taxes is supposed to bear some relationship to opulence. So is the ownership of automobiles. But the nine States which paid more than half of the tax had, in 1921, only 2,484,360 automobiles; the others had 8,021,300. The amount of tax collected from the nine States, per automobile registered in them, was $418; from the other States, $129. This ratio is 3.24 to one—yet the taxes were one to one. New York paid $653 in income and profits taxes for each registered automobile.

All of this goes to emphasize how onerous and unevenly distributed are our present income and profits taxes. They are so adjusted that they tax initiative, hamper industry and put a burden on those whose efforts toward better and more stable business might otherwise bear good fruit. The most heavily taxed regions are those, normally, of greatest and intensest activity—those of concentrated manufacture and of congested population. The question may well be raised whether a taxing policy is wise that puts special hobbles on enterprise and productiveness.

It was estimated in 1917 by a British Governmental agency that 30 per cent of the total consumption of steel in Great Britain before the war was used in shipping and marine engineering. Special interest therefore attaches to the reports of Lloyd's register as to the tonnage of ships under construction and the effect on the British steel industry. These reports for the second quarter help to explain why the present rate of British steel production is only 45 per cent of estimated capacity. For the quarter ended June 30, vessels under construction represented about 1,438,500 tons. The quarterly average in the twelve months immediately preceding the war was 1,890,000 tons, so that operations are now at 451,000 tons less than the average before the war. In the second quarter of 1920 the average tonnage of vessels under construction was 3,578,153, and even so recently as the end of the first quarter last year the figure was 3,798,593 tons. The shrinkage since then has been over 50 per cent. In 1920 the steel output was nearly three times the present rate. It is clear, therefore, that a revival in the British steel industry is contingent upon a marked stimulation of shipbuilding.

Creative Intelligence Hampered

Computations are made from time to time of the loss involved in labor disputes, and the figures are always impressive, as of course they are intended to be. Some of the assumptions might be questioned on the basis that perhaps some of the "loss" can be made up later. There is one loss that is rarely mentioned, yet it very important and it is permanent. That is the loss of exercise of creative intelligence due to men being busied with industrial disputes, and in fact the whole matter of the relation of employer and employed.

The great source of wealth or of prosperity is not labor or capital *per se*. The workman may work hard, may perspire copiously and thoroughly exhaust himself day by day and yet not prosper or produce wealth. Capital may stand at the call of any one, at low interest rates, yet not be employable in a way to produce wealth. Capital furnishes the tools and workmen use the tools. The tool may be a pneumatic riveter, a steam shovel or a blast furnace. The net result of the use of the tool, however the division of the proceeds may be between capital and labor, depends on the efficiency of the tool, and it is creative intelligence that makes the tool efficient.

When the brains of the country must be directed to the solution of strike questions and industrial unrest, when a first duty of the manager of an enterprise is to determine, for example, how much stock of each raw material he must carry as insurance against shortage from strikes, creative intelligence is hampered. The loss thus produced is not only to the individual enterprise but to society at large. If an improved turret lathe is brought into use, the profits fall not alone to the producer. The users, collectively, probably make much more money out of it than the producer, and the customers of the machine shop are benefited also.

But the loss through men being deprived of time and energy that might otherwise be devoted to the exercise of the inventive faculty is not all of the loss caused by labor disputes and the mental attitude that gives rise to them. The exercise of creative intelligence is hampered by doubt whether a new tool or device or process would work advantageously with labor in its present frame of mind. The one who would create must think not only of the intrinsic value of the new thing, but the value, perhaps limited, it would have in future with labor conditions as they may come to be. In the light of this fact it is not difficult to understand the slow development of the molding machine in its earlier history, before it was settled that it would not be under labor union control.

It was due chiefly to improvements resulting from the exercise of creative intelligence that the purchasing power of a week's earnings of workmen tripled in somewhat less than a hundred years preceding the world war. So closely is all prosperity related to the fruits of creative intelligence that the hampering influence of labor conditions should impress every one and encourage every effort for their improvement.

President Opposed to Taking Drastic Action

White House Policy Clearly Indicated—Secretary Hoover Disappointed by Attitude of Henry Ford, and Hopes Plant Will Not Close

WASHINGTON, Aug. 29.—Considering that the bituminous coal situation actually is cleared up and that there is strong hope for an early settlement of the anthracite strike, the Administration now is centering its attention on the railroad problem. It was stated to-day at the White House that the President is firmly convinced that Congress should give him authority at once to take over the railroads and coal mines, but at the same time exercise of such authority would be avoided, if possible, and resorted to only in case of the gravest necessity in the interest of the public. The attitute of the President is represented to be that he does not think there is any existing reason to turn to this drastic measure, but that power to do so should be be given him if the occasion demands it. It would not be adopted with the view of settling labor trouble. Rather it would be used as a means to insure control over the lines so as to provide the necessary distribution of coal and other necessities. It is declared that the President feels he already has power to take over the mines and railroads, but that direct and actual authority should be granted through specific legislation. The power would be directed at proper transportation and not as a means to insure production of coal, confidence being expressed that in view of the settlements brought about and pending, coal production soon will be proceeding at a normal rate.

While the seizure of railroads and coal mines is altogether unlikely, this is especially so with regard to the mines, and Secretary Hoover said this morning that the taking over of the latter is not even contemplated. Sentiment in Congress over granting authority to the President to take over either the carriers or mines is divided, with opposition to the plan growing and it is quite possible that the authority sought by the President will not be granted.

Congress Is Conservative

To indicate that its attitute toward drastic action in the labor situation is cooling, Congress has definitely abandoned the proposal of the President to establish a Federal coal agency for the purchase, sale and distribution of fuel, according to an announcement by Chairman Winslow, of the House committee on Interstate and Foreign Commerce. Resumption of coal mining is assigned as the reason for the change in the attitude of the committee, whose action is said to have been acquiesced in by the President.

The Ford Announcement

The announcement of Henry Ford that he will close his plants on Sept. 16, throwing 105,000 men out of employment, has been a source of disappointment to Secretary Hoover. The Secretary said he hoped Mr. Ford will not feel constrained to take such sweeping action because he thinks the prices of coal are too high. It is felt that legislation under way will control the price situation sufficiently to assure Mr. Ford that coal can be obtained at reasonable figures. It was declared that Mr. Ford uses 3800 tons of coal daily, and produces approximately 5200 cars in a day. Even if he pays $2 a ton more for coal than the $4.50 price, it was stated the added production cost of a Ford car would be not more than $1.50.

One reason for the view taken of Mr. Ford's action is not the single move proposed at the Ford plant, important as it is, but the fact that it might be accepted as an indication of far-reaching and serious consequences. Thought was given to its establishing a precedent for other important industrial employers and consumers that would slacken production in the iron and steel and many allied lines, develop much unemployment during the winter and cause general distress throughout the country. On the other hand, the Administration plainly is hoping that the coal and rail strikes, inevitable causes of rising costs and prices, will not develop a period of wild inflation, such as occurred in 1920, followed by sharp and demoralizing liquidation.

Important Order Issued

WASHINGTON, Aug. 29.—Marked improvement in the bituminous coal situation is reflected in an order issued this afternoon by the Interstate Commerce Commission by which it eliminated classifications four and five in its priority list. Included in the fifth classification are the iron and steel, lumber and allied lines. They now automatically come under class three, which is the lowest. Reports already have reached Washington that the greater freedom of coal for the market has indicated that softer prices are in immediate prospect which may go well under those named by the Government. The probable effect of this order is an increase in the output of industries, including iron and steel and lumber. In its announcement the Interstate Commerce Commission said that the increase in production of bituminous coal and the opening of fields recently closed, near to important markets, have made it possible to rearrange the list of priority uses embraced in service order No. 23 as previously amended, but by the amendment, to-day the emergency uses are all embraced in class two. Class one is reserved for such cases as may be designated from time to time by the commission. All other uses fall within class three. Certain pressing needs of the railroads and of the portion of the Northwest which must practically be served by water before the close of navigation will be met by proper assignment of particular shipments to class one. Certificates from State fuel administrators or committees as to the character of use and the bona fides of the transaction will be deemed sufficient evidence for the railroads in carrying out the direction for priority as to coal for domestic and building heating purposes, as well as other evidence of the right of a particular shipment to be placed within the priority class.

Removal of the fourth and fifth classes more than meets the recent request of the Associated Contractors of America, who asked the commission to dispense with class five as superfluous. The purpose of the request was to expedite transportation of building materials and to afford coal for those engaged in their production.

The order of the commission has resulted in a much more optimistic tone in the fuel situation and is expected to bring early relief to industries of the country by reason of its being based on increased coal production.

No. 1 furnace, Shenango Furnace Co., Sharpsville, Pa., resumed operations Aug. 29 after being banked since the latter part of July.

REFRACTORIES ADVANCE

Prices Marked Up on Account of Higher Cost of Mining Coal

PITTSBURGH, Aug. 29.—Effective Aug. 23, leading makers of refractories advanced prices of fire clay brick $5 per 1000, ground fire clay $1 per ton, silica brick $7 per 1000, ground silica clay $1 per ton, magnesite brick $4 per 100, grain magnesite $2 per ton and chrome brick $3 per 1000. There is only one explanation and that is the virtual settlement of the coal strike on the terms of the strikers, which involves the restoration of the peak wages in the coal mines and puts a heavy increase in the producing costs of the manufacturers. Makers of fire clay and silica brick could not advance wages to the coal miners without also adjusting those of the clay miners and the brick plant workmen and as a result of the increases it is estimated that producing costs have advanced fully 30 per cent as compared with those prior to Aug. 23.

While the new prices have not yet found basis in sales, due to the fact that most manufacturers have rather sizable orders on their books carrying lower prices, which are not affected by the advance, the present quotations are declared to be only tentative and are likely to be further advanced if demands are such as to force manufacturers into the labor market. Pennsylvania makers are finding it hard to secure a sufficient supply of common labor in competition with other industries, and because of that situation they are indisposed to give protection on prices very far ahead. Forward business will be taken only on a basis of prices in effect at time of shipment, as it is asserted that even present prices would not show a fair profit if there were any further increase in labor costs.

The new price of Birmingham silica brick has not yet been announced. The leading producer in that district has withdrawn its most recent quotation of $43, but has not yet decided on a new price.

We quote per 1000, f.o.b. works:

Fire clay	High Duty	Moderate Duty
Pennsylvania	$40.00 to $43.00	$36.00 to $40.00
Ohio	40.00 to 43.00	36.00 to 40.00
Kentucky	40.00 to 43.00	35.00 to 39.00
Illinois	40.00 to 42.00	37.00 to 39.00
Missouri	40.00 to 42.00	35.00 to 39.00
Ground fire clay, per net ton		7.00 to 8.00
Silica brick:		
Pennsylvania		45.00
Chicago		53.00
Birmingham		Nominal
Ground silica clay, per net ton		9.00
Magnesite brick:		
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.)		60.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)		32.00
Chrome brick:		
Standard size, per net ton		45.00

WIRE CLOTH MERGER

Wickwire-Spencer Steel Corporation Acquires American Wire Fabrics Co.

WORCESTER, MASS., Aug. 29—The Wickwire-Spencer Steel Corporation, Worcester and Buffalo, has acquired the American Wire Fabrics Co., Blue Island, Ill., and Mount Wolf, Pa., manufacturer of wire cloth. The price paid is nearly $4,000,000. The purchase has been approved by the directors of the Wickwire-Spencer company and final action will be taken at a meeting of the stockholders called for Worcester, Sept. 8. The transaction will involve various changes in the capitalization of the Wickwire-Spencer corporation, including $1,775,000 of ten-year secured convertible 7½ per cent notes, retiring the class A common shares and increasing the common stock from 250,000 shares to 600,000 shares.

The American Wire Fabrics Co. was organized in 1911 through the consolidation of the American Wire Cloth Co., Clinton, Iowa, the National Wire Cloth Co., Niles, Mich., the New Freedom Wire Cloth Co., New Freedom, Pa., and the Pennsylvania Wire Cloth Co., Mount Wolf, Pa. The products of the company's plants are similar to those of the wire cloth company departments of the Wright & Clinton works of the Wickwire-Spencer company. The American Wire Fabrics Co. will retain its corporate identity. It is now an Iowa corporation and will change to a Delaware charter.

Railroad Car and Locomotive Buying

Orders for 100 locomotives have been placed in the last week and activity in car repair orders and inquiries continues. New car orders are light:

The Louisville & Nashville has ordered 30 Mikado locomotives from the American Locomotive Co.

The Missouri, Kansas & Texas has ordered 45 locomotives from the Lima Locomotive Co. and 10 switching from the American Locomotive Co.

The Illinois Central has awarded 15 locomotives to the Baldwin Locomotive Works.

The Missouri Pacific is in the market for 25 Mikado locomotives.

The Pacific Electric is in the market for 200 dump cars.

The Chicago & North Western is inquiring for repairs on 1000 gondola cars.

The Pere Marquette is in the market for repairs on 1000 box cars.

The Santa Fe has ordered 8 buffet library cars from the Pullman Co.

The Monon has placed 4 passenger cars with the Pullman Co.

The Chicago & Eastern Illinois is inquiring for 17 baggage cars.

The Washburn Lignite Coal Co., Wilton, N. D., is inquiring for 75 steel mine cars.

The Municipal Railway of San Francisco is in the market for 40 part steel street cars.

The Erie is inquiring for 100 steel underframes.

The Lehigh & New England for 100 gondola cars.

The New York Central is having repairs made to 50 locomotives at the shops of the Rome Locomotive Works.

The Central Railroad of New Jersey is having 200 steel hopper cars repaired by the Pressed Steel Car Co.

The Philadelphia & Reading has ordered 100 refrigerator cars from the American Car & Foundry Co.

Sheet Sales Drop

The monthly report of the National Association of Sheet and Tin Plate Manufacturers to the Bureau of the Census, Department of Commerce, for the month of July, discloses conditions quite the reverse of those for June. Sales of members of the association who reported were 143,563 net tons, this total representing only 58.2 per cent of the monthly capacity of the association membership. June sales were 268,032 net tons or 110 per cent of the monthly capacity. Production exceeded the sales by 35,537 tons and shipments were 37,818 tons in excess of the new bookings. In June the sales exceeded production by almost 58,000 tons and the shipments by 65,000 tons, resulting in an increase in unfilled tonnages. The latter item decreased in July, and Aug. 1 found the mills with orders equal to 1663 months' capacity as compared with bookings equivalent to 1797 months' capacity on July 1. Stocks on hand waiting shipment on Aug. 1 were 82,053, an increase of 4802 tons as compared with a month before, but unsold stocks in July were reduced 2591 tons. Deducting stocks awaiting shipment and the unsold stocks, the net obligations of the mills as of Aug. 1 were 308,246 tons as compared with 338,425 on July 1.

The July report compares with that for June as follows:

	July		June	
	Net Tons	Per Cent Capacity	Net Tons	Per Cent Capacity
Total sales	143,563	58.2	268,032	110.0
Total production	179,100	72.7	210,460	86.4
Total shipments	181,381	73.6	203,023	83.3
Unfilled tonnage	409,885	166.3	437,853	179.7
Stock to be shipped	82,053	33.2	77,251	31.7
Stock unsold	19,586	8.0	22,177	8.8

The total number of hot mills in the United States is 641, having a monthly capacity of approximately 365,000 tons and the percentage of the capacity to which the above figures are related is 67 per cent.

FABRICATED STEEL BUSINESS

Bridge and Building Awards and Tonnages Pending at Leading Centers

Awards for fabricated steel work for the past week include the following:

Building for a gas company, Baltimore, 1000 tons, to the Belmont Iron Works.

Manufacturing building, Ansonia, Conn., 250 tons, to the American Bridge Co.

Loft building, Thirty-third Street, New York, 300 tons, to the Paterson Bridge Co.

Highway bridge, Saratoga Springs, N. Y., 500 tons, to the American Bridge Co.

Mill building, Holyoke, Mass., 1100 tons, to the Shoemaker-Satterthwaite Bridge Co.

Building, Philadelphia Trust Co., 200 tons, to the Keystone Structural Co.

New mechanical puddling plant for Youngstown Steel Co., Warren, Ohio, 2000 tons, to American Bridge Co.

Public Service Co. of Northern Illinois, power station, Waukegan, Ill., 2100 tons, to Milwaukee Bridge Co.

Building, Hardie Brothers Co., Pittsburgh, 2200 tons, to American Bridge Co.

National Enameling & Stamping Co., sheet mill addition, Granite City, Ill., 1500 tons, to Mississippi Valley Structural Steel Co.

Vaults and repairs, Union Trust Co., Union Arcade, Pittsburgh, 750 tons, to American Bridge Co.

Buildings, Western Reserve University, Cleveland, 775 tons, to American Bridge Co.

Louisiana & Arkansas Railway Co. shops, Stamps, Ark., 711 tons, to unnamed fabricator.

South Park Commissioners, field house, Chicago, 300 tons, to A. Bolter's Sons.

Highway viaduct, Dubuque County, Iowa, 246 tons, to Pittsburgh-Des Moines Steel Co.

Boiler house, Peshtigo (Wis.) Paper Co., 100 tons, to Worden-Allen Co.

Illinois State Penitentiary Commission, dining hall at Lockport, 150 tons, to Milwaukee Bridge Co.

Coaling station for Union Pacific system, Carter, Wyo., 148 tons, to unnamed fabricator.

Shelter shed for wagon yard, St. Louis, the Supply Commission, City of St. Louis, 147 tons, to Stupp Brothers.

Exchange National Bank Building, Tulsa, Okla., 250 tons, to Kansas City Structural Steel Co.

Spring Street viaduct, Atlanta, Ga., 1200 tons, Virginia Bridge Co. low bidder.

Addition to plant of Gardner-Harvey Paper Co., Middletown, Ohio, 300 tons, to Bellefontaine Bridge Co.

Four-story office building of Chamber of Commerce of United States, Connecticut Avenue and H Street, N. W., Washington, D. C., 1800 tons, to American Bridge Co.

National Bank building, Baltimore, 300 tons, to Dietrich Bros.

Bolton Square Apartment, Cleveland, 700 tons, to the Forest City Iron & Steel Co.

New York Central subway work at Elyria, Ohio, 120 tons, to the McClintic-Marshall Co.

Structural Projects Pending

Inquiries for fabricated steel work which may be added to lists of pending projects include the following:

Power house for the State of New York, Crescent, N. Y., 200 tons.

Highway bridge, Norfolk, Va., 500 tons.

Federal building, Manville, R. I., 200 tons.

Three manufacturing buildings for Lockwood Greene & Co., 300 tons.

Julia Richmond High School, 1600 tons.

Factory building for Fay & Egan Co., Cincinnati, 900 tons, bids close Sept. 11 with Clifford Stegner, architect, 1700 Union Trust Building, Cincinnati.

Addition to office building, United Brethren, Dayton, Ohio, approximately 1000 tons. Plans prepared and bids to be taken shortly.

Stadium at University of Illinois, Champaign, Ill., 500 tons of steel and 1000 tons of reinforcing bars (estimated), general contract reported to be awarded to Chicago contractors.

Large garage for Consolidated Gas & Electric Light Co., Baltimore, 800 tons.

South Side High School, St. Louis, 300 tons.

Collinwood High School, Cleveland, 1500 tons. Bids to be taken Sept. 18.

Feldman Apartment, Detroit, 500 tons.

Commodore Perry Building, Toledo, 1000 tons.

Dr. George B. Waterhouse Accepts Chair of Metallurgy at M. I. T.

Dr. George B. Waterhouse, for the past 16 years connected with the Lackawanna Steel Co., Buffalo, N. Y., has accepted the appointment as head of the department of metallurgy at the Massachusetts Institute of Technology, Boston, and will assume his new duties at the beginning of the college year this fall.

DR. GEORGE B. WATERHOUSE

Doctor Waterhouse will take to his new work a broad practical experience in metallurgy, fortified by a liberal education. He was born on May 25, 1883, and received his early education in Great Britain. Five years of his university training were spent in England, the greater part of which was at the University of Sheffield under Professors J. O. Arnold and Andrew McWilliam. In the United States he had three years at Columbia University under Dr. Henry M. Howe and Bradley Stoughton. Since 1906 he has been with the Lackawanna Steel Co. as metallographist and metallurgist and for the last few years as metallurgical and inspecting engineer. In this work his theoretical training has been broadened by practical experience, especially in the making and working of steel. At the same time he has kept in close touch with developments in this and other countries and has paid particular attention to the work of French and German investigators. His intimate knowledge of the French and German languages has been no small factor in these later studies and in his translated abstracts for THE IRON AGE, which have been a feature in these columns for a number of years.

He is a member of the American Iron and Steel Institute, the Iron and Steel Institute (British), the American Institute of Mining and Metallurgical Engineers, and the American Society for Testing Materials. To most of these societies he has contributed papers and discussions. In the work of the American Association of Steel Manufacturers he has been a regular participant.

Doctor Waterhouse succeeds Prof. H. O. Hofman, who resigned last June as head of the department at the Boston institution, after many years of service. The new appointment represents a change, in that Professor Hofman has been known particularly in connection with non-ferrous metallurgy, whereas the new appointee's life work has been in the metallurgy of iron and steel.

General Advance of 20 Per Cent in Wages of Steel Workers

Since the announcement of the advance of 20 per cent in wages of steel workers by the United States Steel Corporation, advances by independent companies have become general. In some cases, independents had made advances previous to the Steel Corporation announcement, as, for example, the Replogle Steel Co. made an advance of 2c. per hr. July 1. In these cases, advances to bring the scale up to the Steel Corporation schedule have been made. The advance made by operators of Alabama coal mines is 20 per cent and applies to 27,000 men. The usual form of notice posted by independent companies is the same as that of the Steel Corporation constituents, 20 per cent for all day labor and equitable adjustment in wages of all other classes.

Iron and Steel Markets

SEE HIGHER PRICES

Steel Producers Make Advances But Do Little Selling

Better Promise of Fuel But Coke Region Workers Are Still Out—Steel Corporation Prices

A flood of price advances, covering nearly the whole range of iron and steel products from pig iron to nuts and bolts, has followed the wage advances at steel works and at non-union mines. Little steel has been booked at these higher prices, as few producers can promise deliveries, and most of them see further advances later in the year.

To add to the confusion, promises of increase in soft coal production have gone out from Washington, pointing to a more rapid improvement in industry than is indicated in steel. The wiping out of the fourth and fifth classes in the priority scheme of the Commerce Commission, leaving steel in the third but still the last class, is looked on as making no important change. Transportation is to-day, as it has been for weeks, the chief hampering factor.

Thus far the wage advances of 40 per cent and more by non-union mines in the Connellsville region have not brought back the workers and production in this important coke center is still restricted. The attempt to unionize these mines may prolong the idleness of blast furnaces dependent on Connellsville coke.

It is not yet clear how far the 20 per cent advance in steel works wages will relieve the shortage in common labor. That factor is more important in any reckoning as to steel supply in the remainder of the year than is commonly appreciated.

While the Steel Corporation refrains from making price announcements, it has made some late advances. On Aug. 23 it followed an independent producer of standard pipe going up $6 on black and $4 on galvanized, with a $6 advance on oil country goods. On wire products it has gone up $4 per ton to the new independent level of $2.60 per keg for wire nails and to $2.35 per 100 lb. for plain wire, an advance of $2 per ton.

Some independent producers of sheets indicate that their prices for fourth quarter will be considerably above those of the Steel Corporation. Also on bars, plates and shapes, independent prices take a wide range, as high as 2.50c. being asked for plates.

Railroad buying goes on apace. At Chicago three important trunk lines have entered the rail market with inquiries for 1923 amounting to 60,000 tons. It is quite certain that the price will be above the $40 level of 1922, but how far has not yet developed. The week's orders for new locomotives total 100.

New structural steel orders aggregate about 15,000 tons. Of this 2000 tons is for the new mechanical puddling mill of the Youngstown Steel Co. and 1500 tons for a sheet mill addition at the National Enameling & Stamping Co.'s plant.

Considerable new business is offered in plates. Lake Erie shipyards have inquiries for three boats which will take 15,000 tons of steel. Ohio tank shops are figuring on contracts calling for 6500 tons of plates.

The announced purpose to shut down the Ford plant is not accepted as a finality, in view of official assurance from Washington that Detroit industries will get fuel before Sept. 16 and at reasonable prices. However, orders to hold up shipments of Ford materials after Sept. 5 have gone out and have affected several steel plants, sheet mills, manufacturers of forgings and others.

Heavy buying of foreign pig iron has continued in the New York district, where orders for about 40,000 tons were placed, and in other Eastern centers. Seaboard prices on imports are several dollars below those quoted on domestic iron, of which the tonnage obtainable is very limited. One feature of the domestic market has been the shipping of iron long distances. The furnace at Granite City, Ill., has been shipping to Wisconsin, western Pennsylvania, Ohio and Indiana, while Canadian iron has come into Northern States. The Birmingham market has advanced rapidly and as high as $25 has been paid for spot shipment. At Cincinnati and Cleveland, foundry grades have been marked up $3, but the upward trend has halted in Chicago. At Pittsburgh, the market has come to a standstill because virtually no iron is to be had.

THE IRON AGE composite price for finished steel remains at 2.412c. per lb., as last week. This is the highest it has been since July 12, 1921. At the beginning of last January it was 2.062c.

Pig iron has advanced to $29.52 from $26.86 last week. This is the highest point reached by THE IRON AGE pig iron composite price since the $29.93 of Feb. 8, 1921.

Pittsburgh

Continued Curtailment of Steel Production — Little Pig Iron Business

PITTSBURGH, Aug. 29.—The iron and steel industry in this district as yet has made no decided response to the virtual conclusion of the coal strike in the union field, but, on the contrary, appears to have lost additional ground in the matter of steel production, due to the fact that the strike in the hitherto non-union coal districts has not been settled by the recent restoration of peak wage scales and also because the shortage of labor in the steel mills still is unrelieved.

Expectations that the big wage increase would bring the men back to work in the Connellsville district and thus make for a somewhat easier fuel situation for so many of the steel company and blast furnace interests in this and nearby districts, have not been fulfilled. The fuel situation both as regards coal and coke is slightly easier, but not to an extent that makes possible the putting on of additional furnaces or steel plants. Some steel companies will be helped by the resumption of idle union mines, but already the matter of car supplies is bothersome and the fear is expressed that when steel production is increased, difficulty will be encountered in securing a sufficient number of cars to move the finished product. Desire of buyers to get a place on mill books

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Aug. 29, 1922	Aug. 22, 1922	Aug. 1, 1922	Aug. 30, 1921
No. 2X, Philadelphia‡	**$34.14**	$33.14	$29.76	$20.84
No. 2, Valley furnace†	33.00	33.00	28.00	21.00
No. 2, Southern, Cin'ti†	**27.05**	24.05	22.55	23.50
No. 2, Birmingham, Ala.†	**23.00**	20.00	18.50	19.00
No. 2 foundry, Chicago*	30.00	30.00	26.00	21.00
Basic, del'd, eastern Pa.	28.64	28.64	27.25	19.00
Basic, Valley furnace	**30.00**	26.00	25.00	19.00
Valley Bess., del. Pitts.	**33.76**	31.76	26.76	21.96
Malleable, Chicago*	30.00	30.00	26.00	21.00
Malleable, Valley	**33.00**	31.50	27.00	20.00
Gray forge, Pittsburgh	34.76	34.76	27.76	21.96
L. S. charcoal, Chicago	**36.15**	34.65	33.15	33.50
Ferromanganese, seaboard	67.50	67.50	67.50	70.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$40.00	$40.00	$40.00	$47.00
Bess. billets, Pittsburgh	**38.00**	37.50	35.00	29.00
O.-h. billets, Pittsburgh	**38.00**	37.50	35.00	29.00
O.-h. sheet bars, P'gh	**38.00**	37.50	35.00	30.00
Forging billets, base, P'gh	43.00	43.00	40.00	34.00
O.-h. billets, Phila	**45.17**	42.67	40.17	35.74
Wire rods, Pittsburgh	45.00	45.00	40.00	40.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	2.00	2.00	1.70	1.75
Light rails at mill	**2.00**	1.90	1.75	1.75
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.325	2.325	2.025	2.00
Iron bars, Chicago	**2.25**	2.15	2.00	1.75
Steel bars, Pittsburgh	2.00	2.00	1.70	1.70
Steel bars, Chicago	2.35	2.35	1.75	2.08
Steel bars, New York	2.34	2.34	2.04	2.08
Tank plates, Pittsburgh	2.00	2.00	1.70	1.70
Tank plates, Chicago	2.20	2.20	1.75	2.00
Tank plates, New York	2.34	2.34	2.04	2.08
Beams, Pittsburgh	2.00	2.00	1.70	1.75
Beams, Chicago	2.35	2.35	1.75	1.85
Beams, New York	2.34	2.34	2.04	2.13
Steel hoops, Pittsburgh	2.75	2.75	2.50	2.25

Sheets, Nails and Wire,	Aug. 29, 1922	Aug. 22, 1922	Aug. 1, 1922	Aug. 30, 1921
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	3.35	3.35	3.15	2.75
Sheets, galv., No. 28, P'gh	4.35	4.35	4.15	3.75
Sheets, blue an'l'd, 9 & 10	2.50	2.50	2.40	2.25
Wire nails, Pittsburgh	2.60	2.60	2.40	2.75
Plain wire, Pittsburgh	2.35	2.35	2.25	2.50
Barbed wire, galv., P'gh	3.15	3.15	3.05	3.40
Tin plate, 100-lb. box, P'gh	$4.75	$4.75	$4.75	$5.25
Old Materials, Per Gross Ton:				
Carwheels, Chicago	**$22.50**	$21.00	$19.50	$13.75
Carwheels, Philadelphia	19.00	19.00	17.50	17.00
Heavy steel scrap, P'gh	**18.50**	18.25	17.00	13.00
Heavy steel scrap, Phila.	15.50	15.50	15.00	11.50
Heavy steel scrap, Ch'go	**17.00**	16.00	15.50	11.00
No. 1 cast, Pittsburgh	19.00	19.00	19.00	16.50
No. 1 cast, Philadelphia	19.00	19.00	18.00	17.00
No. 1 cast, Ch'go (net ton)	**20.00**	19.50	17.00	13.00
No. 1 RR. wrot, Phila	18.50	18.50	17.50	14.00
No. 1 RR. wrot, Ch'go (net)	**15.50**	15.25	14.25	11.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	*$10.00*	$12.00	$14.00	$3.00
Foundry coke, prompt	*12.00*	13.00	14.50	4.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	14.12½	14.12½	14.12½	12.00
Electrolytic copper, refinery	13.75	13.75	13.75	11.62½
Zinc, St. Louis	**6.25**	6.22½	6.25	4.12½
Zinc, New York	**6.60**	6.57½	6.60	4.62½
Lead, St. Louis	*5.55*	5.60	5.47½	4.20
Lead, New York	5.90	5.90	5.80	4.40
Tin (Straits), New York	*32.30*	32.50	32.75	26.75
Antimony (Asiatic), N. Y.	5.25	5.25	5.25	4.50

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price, Aug. 29, 1922, Finished Steel, 2.412c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

Aug. 22, 1922,	2.412c.
Aug. 1, 1922,	2.169c.
Aug. 30, 1921,	2.293c.
10-year pre-war average,	1.689c.

These products constitute 88 per cent of the United States output of finished steel

Composite Price, Aug. 29, 1922, Pig Iron, $29.52 Per Gross Ton

Based on average basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

Aug. 22, 1922,	$26.86
Aug. 1, 1922,	24.38
Aug. 30, 1921,	19.64
10-year pre-war average,	15.72

still is greater than that of manufacturers to enter orders, and the supply situation still being very acute and increased labor costs immediately ahead, the trend of prices is strongly upward. Few additional advances have been made by independent producers in the past week, but the Steel Corporation, pursuing the same sort of a policy as it did in the decline of 1921 of following rather than making price changes, has in the past week generally followed the advance recently set up by independent manufacturers. The Corporation really has no official quotations on any of its products except pipe and sheets, but on wire products is naming the independent levels on such business as it can take, and on the same basis is naming 1.90c. base, Pittsburgh, on bars and 2c. on plates and shapes.

Announcement by the Ford Motor Co. of its intention to shut down its plants on Sept. 16 and asking that shipments of steel on order be suspended, is viewed in various ways here. Some regard the movement as merely one of publicity, because it is believed that the company was nearing the end of its active producing season. The Carnegie Steel Co., in setting up its recent priority system of mill schedules, virtually had cut off the automotive industry. Suspensions will probably be granted by makers of some lines of automotive steel, but among independent sheet makers the disposition is to refuse suspensions, unless the Ford Motor Co. is willing to pay the prices in effect when shipments are resumed. It is not believed here that the Ford movement will have a very widespread effect.

Pig Iron.—Business has dwindled almost to the vanishing point since a week ago, not so much because of a lack of demand, but because there is so little iron with which to do business. Few producers have any iron to sell and middle interests seem to have sold such stocks as they had. Those who must have supplies find that it is necessary to meet sellers' price views in order to obtain them. The Valley furnaces have no foundry iron to sell and it is impossible now to get supplies in Buffalo or in Cleveland and while iron can be had in southern Ohio and in the South, it is almost impossible to bring it into this district on account of the railroad congestion. Only an appraisal of the price at which special analysis iron from Valley furnaces would sell is possible at this time. Based on prices made elsewhere, the Valley basis on foundry or

malleable iron is about $33. Small sales of standard Bessemer have been made at $32, Valley furnace, and that probably is as low as any more could be bought Basic iron is no longer available at less than $30, Valley furnace, and $32 is the price now demanded by a scrap firm having some Valley iron taken in payment for old material. The Colonial Steel Co., Pittsburgh, is inquiring for 2000 tons of basic iron, but in general the demand for the steel making grades is not very active. Foreign iron of both foundry and steel making grades has been offered here, but no business is reported. The general asking price of foreign iron is $24.50 c.i.f. Atlantic seaboard, which is equivalent to about $27 f.o.b. cars. The Shenango Furnace Co. to-day started up its No. 1 furnace and it is is reported that the Struthers Furnace Co. is accumulating coke and will start its furnace in a few weeks.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$30.00 to $32.00
Bessemer	32.00
Gray forge	33.00
No. 2 foundry	33.00
No. 3 foundry	33.00
Malleable	33.00

Iron and Steel Bars.—Although the Steel Corporation is naming 1.90c., base Pittsburgh, on such tonnages of soft steel bars as it can take from regular customers, in keeping with its priority schedule, buyers who must have specified delivery are finding independents uninterested at less than 2c. As high as 2.25c. is demanded by some.

We quote steel bars rolled from billets at 1.90c. to 2.25c.; reinforcing bars, rolled from billets, 1.90c. to 2.25c. base; rail steel reinforcing bars, 1.90c. to 2c.; refined iron bars, 2.35c. in carloads, f.o.b. mill, Pittsburgh.

Ferroalloys.—The situation presents no material change. Demand generally is slow and prices recently prevailing still hold. It is reported, however, that on account of liberal shipments of coal from British mines to this country, the fuel situation has grown firmer across the water and that British makers of ferromanganese are less anxious for business than they were a short time ago. Domestic spiegeleisen is slightly easier with regard to supplies, due to the fact that coke is available in somewhat larger quantities than it was recently. The quotations of the leading commercial producer of $39 furnace for 20 per cent material and $38 for 16 to 19 per cent are being named on small tonnages, and are being shaded about $1 per ton on round lots.

We quote 78 to 82 per cent ferromanganese, $75 c.i.f. Atlantic seaboard for domestic; British, spot, $72.50; British, future, $67.50; German, 76 to 80 per cent, $67.50 to $70. Average 20 per cent spiegeleisen, $39 furnace; 16 to 19 per cent, $38 furnace; 50 per cent ferrosilicon, domestic, $55 to $60 furnace, freight allowed. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, $45; 11 per cent, $48.30; 12 per cent, $51.60; 13 per cent, $55.60; 14 per cent, $58.60; silvery iron, 6 per cent, $33.50; 7 per cent, $34.50; 8 per cent, $36; 9 per cent, $38; 10 per cent, $40; 11 per cent, $42.50; 12 per cent, $45. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $4.06 per gross ton.

Billets, Sheet Bars and Slabs.—Open market offerings still are exceedingly limited due to the fact that insufficient supplies of fuel and labor shortages render impossible any appreciable increase in steel works operations. Not much business is passing, but this is due more to the lack of supplies than an absence of inquiries. The only sale of consequence that has come to light lately is one of 2000 tons of sheet bars which went at $38, Pittsburgh. This is probably as low as makers would go on billets or slabs if they had any tonnage for sale, and with pig iron at $30 or more, many feel that the price should be at least $40. Any quotations these days are little more than appraisals because actual business is so limited.

We quote 4 x 4-in. soft Bessemer and open-hearth billets at $38 to $40; 2 x 2-in. billets, $38 to $40; Bessemer and open-hearth sheet bars, $38 to $40; slabs, $38 to $40; forging billets, ordinary carbons, $43 to $45, all f.o.b. Youngstown or Pittsburgh mills.

Cold-Finished Steel Bars and Shafting.—A good many makers in this district are supplied with hot-rolled bars by the Carnegie Steel Co. and lately have been largely shut off as a result of a priority scheduling of mills recently set up by that company. Since bar supplies are available from other sources only at high prices, some makers of cold finished bars now regard 2.50c. base, Pittsburgh to be as low as they should sell. There is basis, however, for a price of 2.25c. base, Pittsburgh. The Ford Motor Co. has entered suspensions against all orders with makers here, but this action has not yet been followed by other automobile manufacturers. Ground shafting is unchanged at 2.65c. base, f.o.b. mill for carload.

Wire Rods.—The American Steel & Wire Co. is understood to have named $43, Pittsburgh, for the base size of common soft rods on such business as it could take, but as it is not taking any business at the moment the quotation has no significance. The most recent business was at $45 and that is probably as low as any can be had.

We quote No. 5 common basic or Bessemer rods to domestic consumers, $45; chain rods, $45; screw stock rods, $50; rivet and bolt rods and other rods of that character, $45; high carbon rods, $52 to $55, depending on carbon, per gross ton, f.o.b. Pittsburgh or Youngstown.

Iron and Steel Pipe.—Effective Aug. 23, the National Tube Co. issued new cards meeting the advance made Aug. 15, by the Youngstown Sheet & Tube Co. and subsequently followed by other independent. The leading interest also issued new oil country and line pipe cards, making a horizontal cut of three points in the discount, or an advance in price of $6 per ton. The shortage of the smaller sizes of steel pipe is unrelieved and probably will continue until cold weather halts building work or until labor, rail and fuel conditions are exacting less of a toll on steel productions. Makers are not nearly as heavily obligated on the lap welded sizes as on the butt weld, but are not eager for more business until operating conditions are more settled. The Pure Oil Co. is in the market for 30 miles of 8-in. 29-lb. oil line pipe with couplings, for September delivery. An old inquiry for 200 miles of 20-in. line pipe for the Southwest has been revived. Recent advance in wrought iron pipe seems to have halted buying. Discounts are given on page 569.

Bolts and Nuts.—There is a stronger tendency to prices and actual advances are likely to be announced soon, due to the strength of bar prices, which it is now figured can not be lower in the near future with pig iron at $30 or more and billets appraised at close to $40. Some makers believe that small machine bolts, with rolled threads, should be at 50, 10 and 5, as against the present official quotation of 60, 10 and 10, and other products up accordingly. One local producer in the past week reduced the discount on cold-pressed nuts 50c. per 100-lb. and also on semi-finished nuts, now quoting the latter at 80 per cent off list on small and 75 per cent off list on large. Discounts are given on page 569.

Wire Products.—The American Steel & Wire Co. recently abandoned the prices it has so consistently observed since the early part of the year and has gone to the levels announced two weeks ago by leading independent manufacturers, but only on such business as it is able to take. This company is as heavily committed as it cares to be and is virtually out of the market. Most of the independent manufacturers still are out of the market, but state that if they could take business, they would name $2.60 base per keg, Pittsburgh, for nails and $2.35 base per 100-lb. for wire. The Cambria Steel Co., which is out of production at present, has some nails in stock on which it is quoting $3.25 base per keg, Pittsburgh. The few manufacturers who can take business are not committing themselves very far ahead because it is claimed that the recent advance did not provide for the wage increase which becomes effective Friday and which will add, it is estimated, about $5 per ton to producing costs. Prices are given on page 569.

Steel Rails.—On light rails rolled from new steel the market no longer is quotable at less than 2c. base, this now being the minimum price of the Carnegie Steel Co. One independent producer offering steel rails out of stock has gone to 2.25c. base. Light sections rolled from old standard rails now range from 1.90c. to 2c.

We quote 25 to 45-lb. sections, rolled from new steel, 2c. base; rolled from old rails, 1.90c. to 2c. base; standard rails, $40 per gross ton mill for Bessemer and open-hearth sections.

Boiler Tubes.—The National Tube Co., effective Aug. 23, reduced the discounts on steel lap welded and com-

mercial seamless boiler tubes three points, this being equivalent to an increase of $6 per ton. In its new seamless tube card, the company segregates cold-drawn and hot-rolled tubes. The carload discount on 3¼-in. to 4-in. hot-rolled tubes now is 51 per cent off list, or only three points less, or $6 per ton higher than the base sizes of lap-welded steel tubes. The National Tube Co. cards have been generally adopted by independent makers. A new card, dated Aug. 25, has been issued by makers of charcoal iron boiler tubes in which the discounts on all sizes have been cut seven points, thus increasing the price $14 per ton. New discounts are given on page 569.

Steel Skelp.—Tubular goods producers who have to buy their skelp are having much difficulty in securing supplies because of the shortage in the general supply of steel. Corporation customers whose product does not come within the priority classifications recently set up have been shut off. Prices range from 2c. to 2.25c., but premiums undoubtedly would have to be paid for early deliveries, particularly of grooved skelp.

Track Equipment.—A further advance of $5 per ton has been made in spikes since a week ago, this change finding its chief explanation in the shortage of steel. Some makers also have advanced track bolts $5 per ton, but the old price of $3.50 base per 100-lb. still is possible on attractive business. Prices are given on page 569.

Tin Plate.—Independent makers, on account of increasing labor costs, are beginning to talk higher prices, and it is possible will soon announce an advance of $5 per ton. It is claimed that preferential prices to large buyers are disappearing and that $4.75 per base box, Pittsburgh, now is minimum on new business to either large or small buyers. Container manufacturers seem to be amply covered, and new business is not especially heavy.

Hot-Rolled Flats.—The Steel Corporation has made no public announcement, but is believed to be naming 2.75c. base, Pittsburgh, the price recently set up by independents for fourth quarter business, on such orders as it can take. Some of the makers of strips in this district will suffer as a result of the suspension by the Ford Motor Co.

Cold-Rolled Strips.—The price of 4.25c. base, Pittsburgh, recently named on fourth quarter business by independents, is being generally observed.

Cut Nails.—The Reading Iron Co. has announced an increase of $3 per ton to a base of 2.90c., mill, for carloads and 3c. for less than carloads.

Rivets.—One large maker has announced an advance in large rivets of $7 per ton, and a 5 per cent reduction in the discount on small rivets. Some makers still are taking business at the former price level of $2.65, base, per 100 lb., for button-head structural, and $2.75 for cone-head boiler rivets, but all makers are on a base of 70 per cent off list for small rivets. The strength of the market is explained largely by the scarcity and increasing costs of bars and rods. Prices and discounts are given on page 569.

Structural Material.—Shortage of steel and inability of fabricators to obtain shipments even on old orders is seriously restricting business. Prices on structural jobs have not fully reflected the advances which have taken place to date on plain material, but investors are deterred from closing because of the very indefinite delivery promises that can be made. The Steel Corporation cannot take on much business, but on such tonnages as it is accepting its price is 2c., Pittsburgh. This price now would not interest independent mills. Prices are given on page 569.

Warehouse Business.—The Jones & Laughlin Steel Co. and Carnegie Steel Co. have made further advances in warehouse prices. Bars, plates and shapes have been advanced $3 per ton and bands $6 per ton. New prices are 2.60c. base for bars, 2.70c. for plates and shapes, 3.40c. for bands.

Sheets.—While the Ford Motor Co. has asked for suspensions on shipments of sheets because it proposes to shut down on Sept. 16, other automobile manufacturers, anxious to keep going, still are pressing urgently for delivery. Outside of automobile sheets, the supply situation does not appear to be as taut as it was recently, presumably because the independent mills have managed to keep going until this week at a fairly high rate of operations, and undoubtedly have provided for a good many wants. Operations of independent mills in the first half of this month were in excess of 87 per cent of capacity. No such showing is likely during the second half of the month, because of the decline in the production of steel. In the matter of steel supplies, the leading interest is worse off than the independents, and since it is making no material reduction in its obligations is obliged to turn down much business for delivery over the remainder of this year. Independents are asking advances over the Steel Corporation prices of $3 to $8 per ton, but some independent producers say they have lost business in black sheets at 3.50c. Prices are given on page 569.

Coke and Coal.—There has been a further easing in prices since a week ago, due to increased production. The gain is greater in the union than in the non-union coal fields, because so far the increased wages recently announced in the non-union fields have not resulted in the return to work of many men. The coal market now is quotable at $5 to $5.25 at mines for steam coal, $5.25 to $5.50 for by-product coal, and from $5.50 to $6 for gas coal. Generally the supply of furnace coke is insufficient to attract much furnace buying, but we note sales for Eastern shipment at $10.50 and to the Valley district as low as $10. Furnace coke appears to be quotable from $10 to $11 per net ton at oven. Demand for foundry grade is more constant than that for furnace fuel and the premium of the former over the latter is greater than usual, sales being noted from $12 to $14.

Old Material.—The market maintains all of its recent strength and still is inclined higher, because of light offerings and an increased disinclination on the part of dealers to let go of yard stocks. A Pittsburgh district steel maker still is offering $18.50 for railroad or equivalent heavy melting steel, but has found no takers because dealers feel they would have to pay at least $19 for such material and to sell yard stocks at this price would entail a loss, it is claimed. Since no sales have been made above $18.50 nor below, the market is quotable at that price. On yard heavy melting steel $17.50 seems to measure the top and bottom of the market. All other open-hearth grades are more firmly held than they were recently. This also is true of blast furnace material.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel, railroad and industrial	$18.50
Heavy melting steel, yard	17.50
No. 1 cast, cupola size	$19.00 to 19.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va.; Franklin, and Williamsport, Pa.	18.50 to 19.00
Compressed sheet steel	16.50
Bundled sheet sides and ends	16.50
Railroad knuckles and couplers	19.00 to 19.50
Railroad coil and leaf springs	19.00 to 19.50
Low phosphorus standard bloom and billet ends	22.00 to 22.50
Low phosphorus, plates and other grades	20.00 to 20.50
Railroad malleable	17.00 to 17.50
Iron car axles	27.00 to 28.00
Locomotive axles, steel	25.00 to 26.00
Steel car axles	20.00 to 20.50
Cast iron wheels	20.00 to 20.50
Rolled steel wheels	19.00 to 19.50
Machine shop turnings	14.25 to 14.75
Heavy steel axle turnings	16.00 to 16.50
Short shoveling turnings	16.00 to 16.50
Cast iron borings	16.00 to 16.50
Heavy breakable cast	18.50 to 19.00
Stove plate	14.50 to 15.00
Sheet bar crop ends	20.50 to 21.00
No. 1 railroad wrought	15.50 to 16.00

The Illinois Car Mfg. Co., Hammond, Ind., has purchased the American Nut Co., Columbus, Ohio, and will move the business to Hammond.

Chicago

Heavy Advances in Prices of Finished Products —Many Inquiries

CHICAGO, Aug. 29—The 20 per cent increase in the wages of the steel works labor has been followed by advances in finished steel prices. The minimum quotation on mild steel bars for indefinite delivery has gone up $1 a ton to 1.95c., Chicago, while plates and shapes have advanced $3 a ton to a minimum of 2.05c., Chicago. Tie plates, spikes and bolts, axles and hoops and bands have also been raised, and among the semi-finished products, axle and forging billets are higher and early advances are expected on re-rolling billets and sheet bars. Prices for early shipment are not clearly defined, as buyers are dependent largely on Eastern sources quoting f. o. b. Pittsburgh. The Inland Steel Co., however, is expected to re-enter the market soon when it will announce prices on plates, shapes, bars, sheets and other products for delivery in the last two or three months of the year. Bar iron has advanced to 2.25c., Chicago, and wire products have gone up to the independent level of prices. Discounts on bolts and nuts are expected to be revised upward in view of advances in raw material.

Forward buying of steel shows no decline. In fact, for one large mill, August bookings were slightly heavier than these of the previous month. Inquiries for 1923 delivery are now being received. Quotations have been asked on a substantial tonnage of sheets for first quarter shipment and an inquiry for 3200 tons of nut stock for January and February shipment has been put out by a new local nut and bolt plant. Mills are disinclined to quote that far ahead, although the recent setback in production may result in delaying the delivery of some business now on the books until the first of the year.

The local production situation remains unchanged.

Pig Iron.—No additional merchant furnaces have been banked in this district and while fuel supplies are still low, it is hoped that the next change in the operating situation will be in the direction of greater production. The performance of the merchant stacks in this territory has been remarkable in view of conditions that obtain in other sections of the country. Of the 10 furnaces represented by the leading seller, five are still active, namely, two Iroquois, one Federal, one Mayville, and the Zenith stack. Reports from the East indicate that only one merchant furnace, a Toledo stack, is in blast in Ohio and none is active in Western Pennsylvania. The dearth of iron in that territory is indicated by numerous inquiries received by Chicago producers from various points in Ohio and even in West Virginia. Local prices remain unchanged, although a few spot tonnages have brought premiums, a lot of 150 tons having been sold at as high as $32 base furnace. Melters not only appear to be in need of iron but seem satisfied that present prices are here to stay, if indeed further advances are not made. Demand for prompt iron is unabated and purchases for the remainder of the year are being made freely. The movement of iron from the South is blocked by railroad embargoes. A local broker, however, has made a sale of 1200 tons of Southern foundry for delivery to an Ohio plant of a Chicago concern. A limited amount of consignment iron is finding its way to Chicago, though some of this has been in transit for weeks. Southern prices have generally advanced, the market now being quotable at $24 to $25 base Birmingham. While Southern producers are largely cut off from the Chicago territory at present, this is not true of furnaces in the St. Louis district. A number of large sales of foundry for delivery in this section have been closed at $30 base furnace, f. o. b. St. Louis, a Wisconsin melter having bought 2000 tons, a company with plants in Chicago and Michigan having purchased 1500 tons and a northern Illinois user having ordered 250 tons, all for prompt shipment. Charcoal is now generally quoted at $33 base furnace, and a sale of 400 tons has been made at that price. Copper free low phosphorous is firmly established at $38, Valley Furnace, a sale of 1000 tons having been closed at that quotation. Most low phosphorous furnaces are idle and stocks on furnace banks are low. Silvery has advanced to a minimum of $37.50 f. o. b. Jackson, for 8 per cent. While most melters are confining their attention to their immediate and fourth quarter needs, an inquiry for 500 tons of foundry for first quarter shipment has been received by local sellers. Interest in freight rates from the South has again been aroused by the announcement of a combination rate of $4.18 on shipments via barge from Sheffield and Florence, Ala., to Metropolis, Ill., and by rail over the Chicago, Burlington & Quincy to Chicago. The new rate will become effective Sept. 15 unless suspended by the Interstate Commerce Commission. This rate has been subject to numerous changes. Until July 1 it was $4.66. It was then reduced to $4.33 and on July 20 was advanced to $4.98.

Quotations on Northern foundry, high phosphorus malleable and basic irons are f.o.b. local furnace and do not include a switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards, or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$36.15
Northern coke, No. 1, sil. 2.25 to 2.75	31.00
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	30.00
Northern high phos	30.00
Southern No. 2	$30.00 to 31.00
Malleable, not over 2.25 sil	30.00
Basic	30.00
Low phos. Valley furnace, sil. 1 to 2 per cent copper free	38.00
Silvery, sil. 8 per cent	42.29

Ferroalloys.—A local company has closed for 200 tons of ferromanganese for delivery to plants at various locations. The purchase was made at $67.50, seaboard, and shipment is to be made from foreign sources. Otherwise the ferroalloys are quiet and the price situation is unchanged.

We quote 78 to 82 per cent ferromanganese, future, $75.06; prompt, $77.56 to $82.56, delivered; 50 per cent ferrosilicon, $55, delivered on contract and $57 prompt delivery; spiegeleisen, 18 to 22 per cent, $47 to $49, delivered.

Plates.—Plates are now quoted at from 2.05c. to 2.25c., Chicago, for indefinite delivery, while material for reasonably early shipment is commanding from $2 to $7 a ton above the maximum on forward business. Demand is still active.

The mill quotation is 2.05c. to 2.50c., Chicago. Jobbers quote 2.90c. for plates out of stock.

Cast Iron Pipe.—Minneapolis has awarded 1100 tons to the American Cast Iron Pipe Co. There are no other lettings to report and business generally is quiet. Prices continue to show strength and some makers are now quoting a minimum of $40, base, Birmingham, for 6-in. and larger. Freight congestion in the South is bad as ever and shipments from plants in that section are blocked.

We quote per net ton, f.o.b. Chicago as follows: Water pipe, 4-in., $50.70 to $52.20; 6-in. and above, $46.70 to $48.20; class A and gas pipe, $3 extra.

Warehouse Prices.—Advances in mill prices have been reflected in higher warehouse quotations. Bars, shapes, plates and bands have been advanced $2 a ton, structural and boiler rivets $3 a ton and hoops $4 a ton. Cold-drawn steel bars have also gone up $2. Revised prices are to be found under appropriate paragraphs. A $5 advance on cold-rolled strip steel brings that commodity up to 6.40c. base. Jobbers' prices on standard spikes and track bolts have been advanced $2 a ton to 3.50c. and 4.50c. respectively. Light rails have also been advanced on 25 to 45-lb. sections to 2.70c., 16 to 20-lb. sections to 2.745c., 12-lb. to 2.79c., and 8-lb. to 2.835c. Prices on 50-lb. and heavier sections remain unchanged. Billet prices have also gone up, 0.15 to 0.25 per cent carbon now being quoted at 2.75c. and 0.35 to 0.45 per cent carbon at 2.795.

Wire Products.—Minimum prices on wire, wire nails and cement coated nails are now $2.35, $2.60 and $2.10, Pittsburgh, respectively. With mill operations still far below capacity, demand is considerably in excess of current production. For mill prices, see finished iron and steel, f.o.b. Pittsburgh, page 569.

We quote warehouse prices, f.o.b. Chicago: No. 9 and heavier black annealed wire and No. 9 and heavier bright basic wire, $3.20 per 100 lb.; common wire nails, $3.35 per 100 lb.; cement coated nails, $2.75 per keg.

Bolts and Nuts.—The Nash Motor Works is in the market for a large quantity of nuts. The report that the Ford Motor Co. will shut down Sept. 16 has caused some concern among sellers although it is felt that the

necessity for closing may be averted. Demand from all sources is satisfactory and an early advance in prices is looked for in view of higher material costs. The prices on page 569 apply to this territory except that the basing point is Chicago instead of Pittsburgh.

Jobbers quote structural rivets, 3.50c.; boiler rivets, 3.60c.; machine bolts up to ⅞ x 4 in., 50, 10 and 10 per cent off; larger sizes, 50 and 10 off; carriage bolts up to ⅞ x 6 in., 50 and 5 off; larger sizes, 45 off; hot pressed nuts, squares and hexagons, tapped, $3.25 off; blank nuts, $3.50 off; coach or lag screws, gimlet points, square heads, 60 per cent off; quantity extras are unchanged.

Bars.—Soft steel bars for indefinite delivery are now quoted from a minimum of 1.95c. to 2.15c., Chicago. Demand is still insistent notwithstanding the fact that owing to recent curtailment in production shipments may no be made until first quarter. The scarcity of bars for early shipment continues, with prices ranging from 2.35c., Chicago, up. Bar iron is now firm at 2.25c., Chicago, with demand somewhat lighter. One important producer has obtained additional fuel and has reentered the market. With the settlement of the strike at the Chicago Heights hard steel mills, those plants are again producing. Prices are unchanged on hard bars, the Moline mill quoting 1.85c., f.o.b. plant, or slightly over 2c., Chicago, while local mills are quoting a flat price of 2c., Chicago.

Mill prices are: Mild steel bars, 1.95c. to 2.45c., Chicago; common bar iron, 2.25c., Chicago; rail steel, 2c. to 2.005c., Chicago.

Jobbers quote 2.80c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.80c. for rounds and 4.30c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 2.50c. base; hoops, 3.90c.; bands, 3.55c.

Rails and Track Supplies.—Three important trunk lines entered the market last week with inquiries calling for a total of 60,000 tons of rails for 1923 delivery. Three or four other lines are about to issue inquiries and in view of the fact that rail orders for this year were relatively light, heavy purchases of both rails and fastenings are looked for this fall. Tie plates and spikes and bolts have advanced, tie plates being quoted at $43 to $45, mill, spikes at 2.75c. to 3c., mill, and bolts at 3.75c. to 4c., mill. Light rails are also up, now being quoted at 2c. to 2.25c., mill.

Standard Bessemer and open-hearth rails, $40; light rails rolled from new steel, 2c. to 2.25c., f.o.b. makers' mills.

Standard railroad spikes, 2.75c. to 3c., mill; track bolts with square nuts, 3.75c. to 4c., mill; tie plates, steel and iron, 2.15c. to 2.25c., f.o.b. mill; angle bars, 2.40c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.50c. base and track bolts 4.50c. base.

Semi-Finished Steel.—Axle billets are now quoted at a minimum of $40 and forging billets at $45, f.o.b. Chicago district mill. Sheet bars and rerolling billets are still quoted at $35 to $40, mill, but early advances are looked for.

Pending work includes:

Three-story garage for Paul Cornell estate, Chicago, 150 tons.

Ben Franklin office building, Indianapolis, 185 tons.

Public Service Co. of Northern Illinois, power plant, Waukegan, Ill., 110 tons.

Sheets.—Independent mills are getting $2 more on blue annealed and $3 more on black and galvanized than the prices recently announced for fourth quarter delivery by the American Sheet & Tin Plate Co. The Inland Steel Co. is still out of the market, but is expected to announce fourth quarter prices soon.

Mill quotations are 3.35c. to 3.50c. for No. 28 black, 2.50c. to 2.60c. for No. 10 blue annealed and 4.35c. to 4.50c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote blue annealed, 4c.; black, 4.85c.; galvanized, 5.85c.

Hoops and Bands and Axles.—These products have been advanced, hoops and bands now being quoted 2.75c. to 3c., f.o.b. mill, and axles at 2.50c. to 2.75c., mill.

Steel Castings.—Rising labor and material costs make advance in steel castings appear inevitable. Those foundries which have not anticipated the wage advances made by the Steel Corporation now find that they must raise their men to a parity with those employed by the mills. Meanwhile prices of pig iron and scrap are going up rapidly, with the result that the question of costs is receiving careful consideration.

Structural Material.—The market on plain material for indefinite delivery now ranges from a minimum of 2.05c. to 2.25c., Chicago. Reasonably early shipment is hard to get, but prices of from 2.35c. to 2.55c., delivered Chicago, are not unusual with the trend strongly upward. Fabricating awards for the week are liberal, but competition on new work is declining because shops are filled up and deliveries of material from the mills are slow.

The mill quotation on plain material is 2.05c. to 2.45c., Chicago. Jobbers quote 2.90c. for plain material out of warehouse.

Reinforcing Bars.—In view of limited mill shipments, reinforcing bar sellers are following a careful policy, lest they find themselves unable to discharge present obligations from their warehouse stocks. Their customers are exerting increasing pressure upon them for steel, emphasizing the present scarcity, at the same time indicating a general expectation of further price advances. The slowness of mill shipments has further complicated the situation by increasing the relative demand for material out of warehouse.

Union Electric Light & Power Co., power station, East St. Louis, Ill., 1500 tons, to Paul J. Kalman Co.

Igoe Printing Co. building, Chicago, 650 tons, to Paul J. Kalman Co.

Exchange National Bank, Tulsa, Okla., 350 tons, to Concrete Steel Co.

Hotel building for Main Street Corporation, Evanston, Ill., 176 tons, to Concrete Steel Co.

Masonic Temple building, Guthrie, Okla., 160 tons, to Concrete Steel Co.

Coke.—Local by-product foundry prices remain unchanged. While the Chicago producer has not yet been able to increase its production above 25 per cent, it is making every effort to keep foundries in this section supplied with sufficient coke to avert a suspension of operations. Some coke is also coming in from outside sources, although deliveries, particularly from the East, are uncertain. Considerable Southern by-product foundry coke is moving into this territory, and the fact that shipments are managing to get through is explained by the fact that Southern railroad embargoes apply to pig iron and not to fuel. This coke is selling at the same price as the local product on contract and at higher prices for spot delivery. Connellsville coke has weakened, foundry now being quoted at $14.50, ovens.

Old Material.—The market has mixed characteristics, with caution actuating the attitude of some consumers while others are willing to pay high prices to get spot shipment. At the same time, dealers are paying advancing quotations for such material as is offered. Little scrap is coming from the railroads, the largest producers, with the result that sellers are finding themselves short of some materials or have had to draw heavily on yard stocks. That scrap prices are moving up sympathetically with advances in finished iron and steel products and pig iron is also evident.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton
Iron rails	$20.50 to $21.00
Cast iron car wheels	22.50 to 23.00
Relaying rails	22.50 to 27.50
Rolled or forged steel car wheels	21.50 to 22.00
Rails for rolling	18.00 to 18.50
Steel rails, less than 3 ft	20.50 to 21.00
Heavy melting steel	17.00 to 17.50
Frogs, switches and guards cut apart	17.00 to 17.50
Shoveling steel	16.50 to 17.00
Drop forge flashings	12.50 to 13.00
Hydraulic compressed sheet	14.00 to 14.50
Axle turnings	15.00 to 15.50
	Per Net Ton
Iron angles and splice bars	19.50 to 20.00
Steel angle bars	17.00 to 17.50
Iron arch bars and transoms	20.50 to 21.00
Iron car axles	24.00 to 24.50
Steel car axles	18.50 to 19.00
No. 1 busheling	14.00 to 14.50
No. 2 busheling	9.00 to 9.50
Cut forge	15.00 to 15.50
Pipes and flues	11.50 to 12.00
No. 1 railroad wrought	15.50 to 16.00
No. 2 railroad wrought	15.00 to 15.50
Steel knuckles and couplers	18.50 to 19.00
Coil springs	19.50 to 20.00
No. 1 machinery cast	20.00 to 20.50
No. 1 railroad cast	18.50 to 19.00
Low phos. punchings	16.00 to 16.50
Locomotive tires, smooth	15.50 to 16.00
Machine shop turnings	10.00 to 10.50
Cast borings	12.00 to 12.50
Stove plate	16.50 to 17.00
Grate bars	16.50 to 17.00
Brake shoes	16.50 to 17.00
Railroad malleable	18.00 to 18.50
Agricultural malleable	18.00 to 18.50

Philadelphia

Active Demand for Plates and Bars—Foreign Pig Iron Coming Freely

PHILADELPHIA, Aug. 29.—With the 20 per cent advance in wages going into effect in the iron and steel industry on Friday of the present week, producers will face a further increase in costs which already have been so great that profits either are extremely narrow or have entirely disappeared. But the trade here feels that the wage advance was justified. Estimates have been made by makers that production costs in finished lines increased $5 per ton in August over July. Because September will see further increases, advances in prices in some lines have been made and others are considered to be inevitable. Operations continue at practically the same rate in the Philadelphia district as they were last week, but caution is shown in making commitments, owing to the fuel supply situation. Since the return of miners to work under the Cleveland agreement, the coal supply has improved somewhat, but the iron and steel industry, being in the lowest priority classification, has not so far received any particular benefit.

Demand for pig iron, plates, and bars is active, but sales are limited. Practically no iron is being offered in this district. The chief demand is for foundry grades. Prices of No. 2 plain and No. 2X have advanced $1 per ton and now take a range of $33.14 to $33.64 for the former and $34.14 to $34.64 for the latter, delivered at Philadelphia. Foreign iron is coming in freely, particularly foundry grades. Ferromanganese and manganese imports are also reported to be brisk, especially the former, owing to the impending high tariff duties. Sheets are being quoted at $6 and billets at $2.50 per ton higher by some makers in this district.

The announcement by Henry Ford that he will close his plants on Sept. 16 is widely commented on. Its probable effect is variously interpreted. It is pointed out that this suspension will cut off demand in some lines, as forgings, sheets and accessories, and at the same time reduce the output of scrap, in which there now is a shortage; but it is doubted that Ford's action, unless followed by other large consumers, will halt prices. Some in the trade maintain that another period of inflation already has set in and are apprehensive of the consequence.

Ferroalloys.—No prompt tonnages of ferromanganese are available in this district, except for small lots occasionally obtainable from middlemen. This delivery commands $72.50, seaboard. Third and fourth quarter tonnage is quoted at $67.50 on foreign shipments for 78 to 80 per cent alloys. The trade reports that car wheel makers are showing a tendency to turn to standard spiegeleisen, 19 to 21 per cent, in view of difficulty in getting ferromanganese. Spiegel is quoted and has sold at $38.50. Fair sized shipments of foreign manganese ore are en route to this country. This ore is quoted at 28.50c. to 29c. per unit, a light lot being sold the past week at the lower price.

Pig Iron.—Iron is coming in freely from abroad, especially from the Cleveland district, England. Other shipments are coming from Scotland and France. The greatest demand is for foundry grades, which constitute most of the imported tonnage. Only two furnaces in this district are quoting on foundry. They are able to take but small lots and have advanced prices $1 per ton, No. 2 plain now being quoted at $33.14 to $33.64 and No. 2X at $34.14 to $34.64. Some consumers have vainly scoured the market for small lots of foundry, finding makers out of the market and brokers unable to provide requirements. Small lots of foreign low phosphorus steel making iron have been sold in the past week. One lot of 0.08 phosphorus is reported to have been sold by a British maker of hematite iron. A consumer in Cumberland, Md., is inquiring for 5000 tons of basic iron for immediate shipment, but was unable to find the tonnage in this district. Indicating the scarcity of iron, it is reported that an Eastern seaboard steel works has sold a fair sized lot of off basic to a Pittsburgh district consumer. French, Scotch, and English sales of foundry iron, 2.50 to 3 per cent silicon, have been sold in this district at $31, c.i.f. for the Scotch and $29 for the English and French grades. Three boatloads of this kind of iron will be delivered within two weeks, most of it being Scotch iron. One maker of basic has increased the price 50c. per ton and now is asking $28, furnace.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia, and include freight rates varying from 76 cents to $1.64 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$33.14 to $33.64
East. Pa. No. 2X, 2.25 to 2.75	34.14 to 34.64
East. Pa. No. 1X	35.64
Virginia No. 2 plain, 1.75 to 2.25 sil.	29.17 to 30.17
Virginia No. 2X, 2.25 to 2.75 sil.	30.17 to 31.17
Basic delivery eastern Pa.	28.64 to 31.14
Gray forge	29.50 to 31.50
Malleable	30.00 to 32.00
Standard low phos. (f.o.b. furnace)	35.00
Copper bearing low phos. (f.o.b. furnace)	35.00 to 40.00

Semi-Finished Steel.—Makers of open-hearth forging and rerolling billets are asking an increase of $2.50 per ton for September-October delivery, but are not quoting beyond that period. This brings the price of the former to $45, base, Pittsburgh, and the latter to $40, base, Pittsburgh, the freight rate to Philadelphia being $5.17. No sales have been reported during the past week.

Plates.—While most makers of plates continue to quote 2.25c. base, Pittsburgh, one prominent producer has advanced to 2.50c. Demand is heavy, particularly from locomotive works and railroads. Car repairs are bringing large inquiry. Most makers are taking orders from regular customers only and are not quoting beyond the third quarter. Considerable business is being declined owing to restricted operations and uncertainty of the market. A producer with 24 open-hearth furnaces is able to operate only 10 and is using oil for fuel. Deliveries on universal plates are being promised in four to six weeks and on sheared plates in eight to twelve weeks. An inquiry is out for 2000 tons of plates for Eastern shipyards for fourth quarter delivery. The M. K. & T. railroad has placed orders for 50 locomotives, 45 going to the Lima Locomotive Works, Inc. and five to the American Locomotive Co. The Illinois Central has placed an order for 15 locomotives with the Baldwin Locomotive Works.

Structural Material.—While the range of 2c. to 2.25c., Pittsburgh, still exists for plain material, the market is firmer and the higher figure is being quoted by most interests, and it is now doubtful whether any sizeable tonnage could be obtained at the lower quotation. Inquiry for structural material is only fair. Reluctance is shown by mills to quote on anything but immediate specifications. Dietrich Bros. have been awarded a contract for 300 tons for the National Bank building, Baltimore. Inquiries include 700 tons for an office building at Richmond for the State of Virginia and 800 tons for a large garage for the Consolidated Gas & Electric Light Co., Baltimore.

Bars.—Soft steel bars are being inquired for in fair-sized volume, some of the prospective business coming from jobbers. Prices are firm and the price of 2c., base, Pittsburgh, has practically disappeared, giving place to quotations ranging from 2.15c. to 2.25c. Delivery is being promised in four to six weeks. Iron bar demand also is fair, with the price range from 2c. to 2.25c., Pittsburgh, for car lots, and it is probable less than carloads could be bought at the higher figure.

Warehouse Business.—Active demand exists for stock material and is most marked for light bands and spring steel, the prices of which have been increased. Spring steel has been advanced from 3.50c. to 4c. and light bands from 3.45c. to 3.60c. Higher costs are assigned as the cause for the greater levels, at which tonnage is moving.

Soft steel bars and small shapes, 2.80c.; iron bars (except bands), 2.80c.; round edge iron, 3c.; round edge steel, iron finish, 1½ x ½ in., 3c.; round edge steel planished, 3.75c.; tank steel plates, ¼-in. and heavier, 2.90c.; tank steel plates, 3/16-in., 3.10c.; blue annealed steel sheets, No. 10 gage, 3.60c.; black sheets, No. 28 gage, 4.45c.; galvanized sheets, No. 28 gage, 5.60c.; square twisted and deformed steel bars, 2.90c.; structural shapes, 2.90c.; diamond pattern plates, ¼-in., 4.80c.; 3/16-in., 5c.; spring steel, 4c.; round cold-rolled steel, 3.50c.; squares and hexagons, cold-rolled steel, 4c.; steel hoops, No. 13 gage and lighter, 4c.; steel bands, No. 12 gage to 3/16-in., inclusive, 3.60c.; rails, 2.80c.; tool steel, 8c.; Norway iron, 5.50c.

Sheets.—Independent makers now are asking 3.50c. for one-pass No. 28 black sheets, 4.70c. for No. 28 galvanized sheets and 2.75c. for No. 10 blue annealed sheets for September-October shipment. Inquiry is only moderate.

Nuts, Bolts and Rivets.—Standard railroad spikes have been advanced by a prominent producer in this district to 2.50c. per lb., Pittsburgh, this including sizes 5/16-in. and larger, while an increase from 2.90c. to 3c. has been made on the smaller sizes, 1/2-in., 7/16-in. and 3/8-in. Railroad demand is heavy. Fair inquiry is being made for bolts and nuts. Rivet demand is extremely quiet. Large machine bolts are quoted at 60 and 10 per cent off list.

Old Material.—No change has been made in prices of iron and steel scrap during the past week, but the market has developed a firmer tone. Higher quotations are expected to be made in the near future. Demand is active and considerable business is being declined. Dealers are holding back. One reason assigned for further advances is an expected car shortage. It also is contended that less scrap is being produced by the railroads and that the closing down of the Ford plant will restrict the output. Coupled with this is the shortage of pig iron, calling for heavy charges of old material in open-hearth furnaces. Demand is strongest for cast iron car wheels, No. 1 heavy melting, No. 1 railroad wrought and machine shop turnings somewhat better inquiry for blast furnace borings and turnings has come out. These grades have been in smallest demand owing to the blowing out and banking of furnaces, but are being used more freely owing to the high price of coal and coke.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$15.50 to $16.00
Scrap rails	15.50 to 16.00
Steel rails for rolling	17.00 to 17.50
No. 1 low phos., heavy 0.04 and under	22.00 to 24.00
Cast iron car wheels	19.00 to 19.50
No. 1 railroad wrought	18.50 to 19.00
No. 1 yard wrought	17.00 to 17.50
No. 1 forge fire	14.00 to 14.50
Bundled sheets (for steel works)	13.50 to 14.00
No. 1 busheling	12.50 to 13.00
No. 2 busheling	10.00 to 11.00
Turnings (short shoveling grade for blast furnace use)	13.00 to 13.50
Mixed borings and turnings (for blast furnace use)	13.00 to 13.50
Machine-shop turnings (for steel works use)	13.50 to 14.00
Machine-shop turnings (for rolling mill use)	14.50 to 15.00
Heavy axle turnings (or equivalent)	14.50 to 15.00
Cast borings (for steel works and rolling mills)	14.50 to 15.00
Cast borings (for chemical plants)	17.00 to 17.50
No. 1 cast	19.00 to 20.00
Heavy breakable cast (for steel plants)	19.00 to 19.50
Railroad grate bars	15.50 to 16.00
Stove plate (for steel plant use)	15.00 to 16.00
Railroad malleable	15.00 to 15.50
Wrought iron and soft steel pipes and tubes (new specifications)	14.00 to 14.50
Shafting	21.00 to 22.00

Buffalo

BUFFALO, Aug. 29.

Pig Iron.—The market for pig iron is very firm with furnaces showing no disposition to shade the higher prices which have recently been established in this district. No. 2 plain is being sold at $33, sales made on this basis ranging well above 2500 tons. A high silicon grade of foundry iron has sold at $36 with other grades ranging between these two prices. Inquiry shows some improvement, being close to 15,000 tons. One consumer is in the market for 4000 tons of iron. Present operation is not likely to be changed, it is indicated by producers. Scotch iron is being offered here at prices just below those asked for the product of local furnaces.

We quote f.o.b. per gross ton Buffalo as follows, the higher prices being for early shipment:

No. 1 foundry, 2.75 to 3.25 sil.	$35.00 to $36.00
No. 2X foundry, 2.25 to 2.75 sil.	34.00 to 35.00
No. 2 plain, 1.75 to 2.25 sil.	33.00 to 34.00
Basic	33.00
Malleable	32.00 to 33.00
Lake Superior charcoal	33.28

Finished Iron and Steel.—There has been a slackening in demand for most finished materials. The demand for bars, shapes and plates has declined, but the ruling price of $2.25 is being firmly maintained. There is some disposition to look for higher prices after Sept. 1, when wage increases go into effect, as fuel costs have not yet declined to anything like normal levels. Buffalo mills have taken on some good-sized bar orders including one of 1000 tons. It is possible to get business at the 2.25c. price as the Corporation is giving no promise of shipment while quoting 1.90c. A Buffalo fabricator has taken an 800-ton contract, the material to be used in an ore bridge.

Warehouse Business.—Warehouses report an excellent demand for materials, due to consumers' inability to get prompt deliveries from any of the mills or selling agencies in this district. Prices which were recently fixed at higher levels than those which had been in effect are being maintained. Warehouses are coming into the market for tonnage to replenish depleted stocks.

We quote warehouse prices, Buffalo, as follows: Structural shapes, 2.90c.; plates, 2.90c.; soft steel bars, 2.80c.; hoops, 3.70c.; bands, 3.55c.; blue annealed sheets, No. 10 gage, 3.90c.; galvanized steel sheets, No. 28 gage, 5.55c.; black sheets, No. 28, 4.55c.; cold rolled round shafting, 3.80c.

Old Material.—There is a good demand for heavy melting steel with most of the mills here in the market for material. Prices paid range from $17 to $17.25. There is little free tonnage on the market, due to the delay in railroad lists. Outside demand and offers of higher prices have resulted in advanced prices in some materials, notably machinery cast, which is now bringing $19 to $20 and car wheels which are selling for $18.50 to $19.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel	$16.75 to $17.00
Low phos., 0.04 and under	18.00 to 19.00
No. 1 railroad wrought	16.00 to 16.50
Car wheels	18.50 to 19.00
Machine shop turnings	10.50 to 11.00
Cast iron borings	14.00 to 14.50
Heavy axle turnings	14.00 to 14.50
Grate bars	14.00 to 14.50
No. 1 busheling	15.00 to 15.50
Stove plate	15.00 to 15.50
Bundled sheet stampings	11.50 to 12.00
No. 1 machinery cast	18.50 to 19.00
Hydraulic compressed	15.00 to 15.50
Railroad malleable	18.00 to 19.00

Cleveland

Pig Iron Prices Advance $3—Hold Up Orders for Ford Supplies

CLEVELAND, Aug. 29.—The fuel situation has improved in that with the operation of Ohio mines, steam coal is available, but shipments of Virginia and Kentucky coking coal curtailed by the impairment of transportation facilities show no improvements. The Bourne-Fuller Co. will advance wages at its Upton Steel Plant Sept. 1 to the new Steel Corporation scale. Recently the McKinney Steel Co. and the Otis Steel Co. advanced wages for common labor to 35c. per hour or 1c. less than the new Corporation rate and their present schedule will probably remain in effect. The announcement of the Ford Motor Co. that it will close its plant Sept. 16 because of the lack of fuel and the broadcasting of orders cutting out shipment of parts on contract after Sept. 5 has affected several Ohio steel plants and a number of manufacturers of forgings and other parts. Mills have received hold up orders on steel bars for Ford forgings and alloy steel makers have been ordered to suspend shipments for 30 days on some contracts. Some sheet mills have been instructed to discontinue shipments after orders are filled on August specifications. A number of Cleveland consumers report that their shortage of steel is acute.

No announcement as to whether the 20 per cent wage advance of the Steel Corporation will apply to its iron ore mines has as yet reached local Corporation officers or local ore men. Reports from the mining districts state that no notices have been posted at the mines advising the wage increase. Independent mining companies are naturally deeply interested, as they will probably meet any wage advance made by the Corporation. The blowing out of blast furnaces has resulted in the temporary holding up of ore shipments of some

consumers, but no requests for cancellations are reported.

Pig Iron.—With the pig iron shortage daily becoming more acute the Cleveland price on foundry iron advanced $3 a ton to $35 during the week and some producers are predicting that the price will reach $40 or higher. With stocks growing low, foundries are crowding furnaces for deliveries. A local producer, the only lake furnace interest except at Buffalo that has any iron available for early shipment, has sold 1000 to 2000 tons in lots of 400 tons and under at $35 for delivery in Cleveland and vicinity. With advancing prices, considerable inquiry came out during the week for foundry iron for early shipment and for the fourth quarter. Several inquiries, including two for 1000 to 1500 tons and another for 900 tons were made for foundry iron for the first quarter of next year, but producers declined to quote on these inquiries. A limited amount of foundry iron is being offered in northern Ohio by the southern Ohio furnace of a steel-making plant and a Canadian steel maker has sold some foundry iron in Indiana. Local sales of southern Ohio foundry iron are reported at $30 to $32 at furnace and one car lot of resale iron brought $36 or $33 at furnace. In Buffalo an 800-ton lot of No. 2X iron for prompt shipment brought $35. In the Michigan territory, a small lot sale was made by a lake furnace at $33 for prompt shipment and a 1500-ton lot of malleable iron was placed for the fourth quarter at $31. Many inquiries are coming from outside of this territory. Larger inquiries pending include 3000 tons of malleable iron for the Eastern Malleable Iron Works, Bridgeport, Conn., 500 tons of foundry iron for the Titusville Iron Works, Titusville, Pa., both for September and October shipment, and 500 tons of malleable iron for the Mount Vernon Car & Mfg. Co., Mount Vernon, Ill., for the fourth quarter. No new inquiries have come out for basic iron, but a local producer would probably quote not less than $35 for this grade. Low phosphorus iron has advanced $1 a ton to $38 on several sales aggregating 1000 tons and including a 500-ton lot. This iron is also very scarce and a Valley producer is evidently the only one that has any low phosphorus iron in stock. Little, if any, Southern iron is being offered in this territory, producers being unwilling to name prices, as they are unable to get cars for shipment. One producer of Ohio silvery iron has announced a price of $37.50 for 8 per cent silvery and $46.50 for 10 per cent Bessemer ferrosilicon for delivery during the remainder of the year, or a $5 advance above the regular schedule. Another furnace that has a small tonnage of the 9 per cent silvery iron available for prompt shipment is offering this at $43.50 or on a $41.50 base.

Quotations below are f.o.b. local furnace for Northern foundry iron, not including a 50c. switching charge. Other quotations except basic and low phosphorus are delivered Cleveland, being based on a $3.02 rate from Jackson and a $6 rate from Birmingham:

Basic, Valley furnace, nominal		$27.00
Northern No. 2 fdy., sil. 1.75 to 2.25		35.00
Southern fdy., sil. 1.75 to 2.25	30.00 to	31.00
Malleable		35.00
Ohio silvery, nom., sil. 8 per cent	40.52 to	43.52
Standard low phos., Valley furnace		38.00

Iron Ore.—Shipping conditions in the Mesabi district are fairly good, but the Chicago & Northwestern and the Chicago, Milwaukee & St. Paul Railroads are still badly crippled. Consequently, shippers are moving only mine production from the old ranges to Ashland and Escanaba. Ore continues to move freely from lake ports, as the transportation facilities of roads that carry the bulk of the ore are not badly crippled. However, two coal-carrying roads, the Baltimore & Ohio and Wheeling & Lake Erie, are unable to keep up their normal movement of ore.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, $5.95; Old range non-Bessemer, 51½ per cent iron, $5.20; Mesabi Bessemer, 55 per cent iron, $5.70; Mesabi non-Bessemer, 51½ per cent iron, $5.05.

Semi-finished Steel.—A local mill has sold to an Ohio consumer 3000 tons of sheet bars at $40 for prompt shipment or an advance of $2.50 above sales previously reported, but has no more to sell for early delivery. Considerable business in semi-finished steel has been taken for the fourth quarter subject to prices prevailing at time of shipment.

Finished Iron and Steel.—The price tendency continues upward. Premium prices on steel bars, plates and structural material for early shipment were more in evidence the past week than heretofore. A heavy volume of inquiries came out, due evidently to the fact that many consumers wanted to get under contract before prices further advanced. A wide range of quotations is appearing, depending largely on delivery. On steel bars there is a spread of prices from around 1.90c. to 2.25c. and higher. One producer is now offering bars only at warehouse prices. Considerable plate business has been booked at 2.25c. and quotations by independent mills generally range from 2c. to 2.35c. A Valley mill has advanced its car-lot price to 2.50c. An Eastern mill now quotes 2.75c. Local shipyards have new inquiries for three boats requiring 15,000 tons of plates and structural material and Ohio tank shops are figuring on inquiries for tanks requiring 6500 tons of plates. A Buffalo district car builder is inquiring for 2000 tons. The Lima Locomotive Works has taken 40 locomotives for the Missouri, Kansas & Texas Railroad and for these has placed 1200 tons of boiler plates with a local mill. Inquiry for steel for building work continues heavy.

Jobbers quote steel bars, 2.81c.; plates and structural shapes, 2.91c.; No. 9 galvanized wire, 3c.; No. 9 annealed wire, 2.50c.; No. 28 black sheets, 4.25c.; No. 28 galvanized sheets, 5.25c.; No. 10 blue annealed sheets, 3.50c. to 3.61c.; hoops and bands, 3.61c.; cold-rolled rounds, 3.60c.; flats, squares and hexagons, 4.10c.

Sheets.—Demand for sheets is not as heavy as it has been and only a limited amount of buying is reported for the fourth quarter. Some mills can still make good deliveries. The most common quotations for independent mills are unchanged, at 3.50c. for black; 4.50c. for galvanized and 2.50c. for blue annealed.

Alloy Steel.—Alloy steel manufacturers have advanced prices $5 per ton because of the increased production costs. Mills have large tonnages on their books and cannot make definite delivery promises. The new prices on bars are 5.75c. for 3.50 per cent nickel steel; 4.75c. for chrome nickel steel and 5.25c. for chrome vanadium.

High Speed Steel.—The demand for high speed steel has improved, but prices are still irregular. Quotations of 60c. per lb. are being made to large consumers.

Old Material.—The market is firmer on nearly all grades and prices are from 50c. to $1 a ton higher. There is still some demand from dealers for scrap to fill high-priced orders released by the McKinney Steel Co., but virtually no demand from the mills. As high as $18.50 is being offered for selected steel scrap delivered at the McKinney plant, but $17.50 more nearly represents the market. Sales during the week range from $16.50 to $18.50. Dealers are offering $15.25 to $15.50 delivered for compressed steel scrap, and cast iron borings have sold up to $13.75 delivered. Sales of No. 1 cast scrap to a local foundry are reported at $16.50 to $17 per net ton. Higher prices have not brought out much scrap. Some dealers are holding to their yard stock, expecting further advances.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel	$16.75 to $17.25
Steel rails, under 3 ft	16.75 to 17.25
Rails for rolling	16.75 to 17.25
Iron rails	14.00 to 15.00
Iron car axles	18.00 to 19.00
Low phosphorus melting	17.25 to 17.75
Cast borings	12.75 to 13.00
Machine shop turnings	12.25 to 12.50
Mixed borings and short turnings	12.25 to 12.50
Compressed steel	14.50 to 14.75
Railroad wrought	14.00 to 14.50
Railroad malleable	16.50 to 16.75
Light bundled sheet stampings	11.00 to 11.25
Steel axle turnings	13.50 to 14.00
No. 1 cast	17.00 to 17.50
No. 1 busheling	12.00 to 12.50
Drop forge flashings over 10 in	11.50 to 12.00
Drop forge flashings under 10 in	11.50 to 12.00
Railroad grate bars	13.75 to 14.25
Stove plate	13.75 to 14.25
Pipes and flues	10.00 to 11.00

Reinforcing Bars.—Mills have made another $2 per ton advance on hard steel reinforcing bars to 2c. Deliveries are very slow. New inquiries include a 300-ton

lot for the Collinwood High School, Cleveland. Local warehouses have made another price advance of $3 per ton on steel bars, plates and structural material and on cold-rolled steel and $4 per ton on hoops and bands. Warehouse sales are heavy.

Coke.—Sales of 20 carlots of Indianapolis by-product foundry coke are reported at $15 at oven. A few carlot sales of Connellsville foundry coke were made during the week at $15, the price that has prevailed recently.

New York

Heavy Buying of Foreign Pig Iron—Large Sales of Charcoal Boiler Tubes

NEW YORK, Aug. 29.—Partial settlement of the coal strike on the basis of the Cleveland agreement has not improved the general situation. There has been a temporary easing in the coke market and as low as $12 has been done on a rather poor grade of furnace coke, but the price tendency is now distinctly upward and furnace coke is quoted at from $13 to $14, and foundry grades from $14 to $15.50. Many users of anthracite coal, seeing that they probably will not be able to get their usual supplies, are buying coke and bituminous coal. This has strengthened the market for those fuels. Coal can be had at from $5.25 to $6.25 a ton, which is a decline of $1.50 below recent quotations, and compares with $2 on April 1, when the strike was declared. The outlook is that there will be many complications in getting an increased production of coal and coke, owing to the arbitrary attitude of the labor unions. All reports indicate that the struggle in the Connellsville region is to be a desperate one between the union organizers and sympathizers and the non-union men who have just obtained an advance in wages variously estimated to average from 40 to 47 per cent.

Pig Iron.—Activity has been confined during the past week largely to foreign iron, of which one firm has sold 25,000 tons and others about 15,000 tons. A radiator company which was in the market for 5000 tons is credited with purchasing foreign iron, but most of the buying has been in small lots. Scotch iron, analyzing 1.75 to 2.25 silicon, has sold at $29, c.i.f. New York, French iron of about the same analysis at $28 and British at $29. Scotch iron analyzing 2.50 to 3.25 silicon has commanded $32. Domestic selling has been confined to two furnaces and most of the sales have been made on a basis of $32 for No. 2 plain and $33 for No. 2X, although some sales have been made $1 higher.

We quote delivered in the New York district as follows, having added to furnace prices $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$36.27 to $37.27
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	35.27 to 36.27
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	34.27 to 35.27
Buffalo, sil. 1.75 to 2.25	34.91 to 35.91
No. 2 Virginia, sil. 1.75 to 2.25	34.44 to 36.44

Iron Ore.—The reduced freight rates on iron ore became effective Monday, but there is very little activity among Eastern operators on account of the limited demand from furnaces, many of which are well supplied with Lake Superior and foreign ores.

Ferroalloys.—Sales of moderate amounts of ferromanganese continue to be made for shipment in September, transactions for the week being several hundred tons at the prevailing price. There have also been sales of 1500 to 2000 tons for October shipment. Spot delivery, if available, is slightly higher. There are also other inquiries but the volume is not heavy and operations in the steel mills, together with the large quantities contracted for, tend to make a quiet market. The spiegeleisen market is moderately active, sales aggregating to 1500 tons of both domestic and imported alloy and prices ranging from $37.50 to $39, furnace. There are also inquiries before the market. One Eastern steel company is reported to have contracted for a cargo of manganese ore at 28.50c. per unit, seaboard, but there is no marked activity in this market. Specifications on contract for 50 per cent ferrosilicon continue satisfactory and there are also sales of prompt lots at prevailing quotations. The same is true of the ferrochromium market. Quotations are as follows:

Ferromanganese, domestic, seaboard, per ton	$67.50
Ferromanganese, British, seaboard, per ton	$67.50
Spiegeleisen, 17 to 19 per cent, furnace	$38.00
Spiegeleisen, 20 per cent, furnace	$39.00
Ferrosilicon, 50 per cent, delivered, per gross ton, carloads	$55.00 to $60.00
Ferrosilicon, 10 to 15 per cent, delivered, per gross ton	$38.00 to $40.00
Ferrotungsten, per lb. of contained metal	40c. to 50c.
Ferrochromium, 4 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr., delivered	12c. to 14c.
Ferrovanadium, per lb. of contained vanadium	$3.00 to $3.50
Ferrocarbontitanium, 15 to 18 per cent, in carloads, per net ton	$200.00

Ores

Manganese ore, foreign, per unit, seaboard	28c. to 30c.
Tungsten ore, per unit, in 60 per cent concentrates, nominal	$3.00 up
Chrome ore, basis 48 per cent Cr_2O_3, crude, per ton, Atlantic seaboard	$15 to $18.50
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	42.50c. to 45c.

Finished Iron and Steel.—Substantial inquiries for plates, shapes, bars and other finished material are reported, but several large companies are unable to quote because of restricted operations or fully booked mills. Some sellers report sales of various products at advancing prices, or at recently established new prices. The outstanding feature continues to be a scarcity of coal with the amount of relief in sight very uncertain. The danger of a runaway market is admitted, but a restraining factor is the fresh experience of 1920. Some predict a shortage of coal and of cars, the extent of which is hard to measure. One seller would not be surprised to see a 2.50c. market for plates, shapes and bars in the not distant future. Plates are firm at 2.15c. to 2.25c., Pittsburgh, for early delivery from independent producers where obtainable, with shapes and bars at 2c. to 2.25c. Two large inquiries from a large oil company, one for 1000 tons of plates, and another for 4000 to 5000 tons of plates and shapes, 3300 tons of which is plates, has been partly satisfied. The former has been placed with a large Alabama producer, but the latter is still under negotiation. An inquiry for 3000 tons of reinforcing bars from a New Jersey consumer is noted. Sales of bar iron in substantial quantities have been made at advancing prices. There have also been fair transactions in black and galvanized sheets and it is doubtful if the latter can be obtained at less than 4.50c. to 4.60c. for any reasonable delivery from independent producers. There have also been large sales of charcoal boiler tubes. The coal mines of a large independent Pittsburgh steel producer have been started again and, at a meeting of sales representatives later this week, a definite sales policy may be decided. In fabricated steel, inquiries are not as numerous and new business in railroad cars is at a low ebb. It is rumored that the Pennsylvania Railroad is to inquire for 30,000 new cars and the New York Central for 10,000.

We quote for mill shipments, New York delivery, as follows: For indefinite delivery, soft steel bars, structural shapes and steel plates, 2.14c.; for delivery in a number of weeks, soft steel bars, plain structural material and steel plates, 2.34c. to 2.59c.; bar iron, 2.34c.

Bolts, Nuts and Rivets.—Bolt and nut manufacturers are getting a good volume of orders largely in specifications on contracts. The market is very firm with talk of higher prices. Specifications on rivet contracts are fairly heavy and production is being hampered by the lack of steel. Some manufacturers are quoting rivets at an advance of $7 a ton or at 3c. for structural and 3.10c. for boiler rivets for small lot orders and sales have been made at these prices. While the old prices have not been withdrawn, an early general price advance seems probable.

Cast-Iron Pipe.—Demand continues heavy and prices are firm. Producers in this district are fairly well situated on fuel, although supplies are low, but there has been some difficulty in obtaining iron shipped by Southern furnaces, which is delayed in transit by the railroad strike. One pipe producer reports that out of 56 carloads recently shipped from the South, he has

received but one. Receipts of foreign iron, however, are aiding materially. No new municipal tenders are noted. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger $54.50; 4-in. and 5-in. $59; 3-in. $64.80, with $4 additional for Class A and gas pipe.

Warehouse Business.—Effective Aug. 28, quotations in this district on bars, shapes, plates, hoops and bands were again advanced, the second increase this month. Both iron and soft steel bars are now quoted at 2.94c. per lb. base, shapes 3.04c. per lb., plates 3.04c. per lb., hoops 4.14c. per lb. and bands 3.74c. per lb. These prices represent a $3 per ton advance and are based upon the current mill quotation of 1.95c. per lb. base, Pittsburgh, plus the current freight rates. Effective Aug. 24, blue annealed, black and galvanized sheets, prices on which were not changed when iron and steel items were previously increased, were increased to 4.04 per lb. for No. 10 blue annealed, 4.60c. per lb., base, for black, and 5.60c. per lb., base, for galvanized sheets. Some sellers, however, are still under the market and quotations are being made on black and galvanized as low as 4.35c. per lb. and 5.35c. per lb. Tire steel has been advanced to 2.94c. per lb. with smooth finish at 3.14c. per lb. and toe-calk is now 4c. per lb., an advance of 30c. per 100 lb. over the previous quotation of 3.70c. per lb. Both wrought iron and steel pipe schedules have been advanced. The wrought iron pipe discounts represent an advance of about $10 per ton. We quote prices on page 584.

Old Material.—The market is firm and prices strong, in some instances exhibiting an upward tendency. Steel is in greater demand than cast-iron, but on the whole, buying is not heavy.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard	$10.50 to $11.00
Steel rails, short lengths, or equivalent	12.25 to 12.75
Rerolling rails	12.50 to 13.00
Relaying rails, nominal	27.00 to 28.00
Steel car axles	17.00 to 18.00
Iron car axles	23.00 to 24.00
No. 1 railroad wrought	13.50 to 14.00
Wrought iron track	12.25 to 12.75
Forge fire	8.00 to 8.50
No. 1 yard wrought, long	11.00 to 11.50
Cast borings (clean)	10.75 to 11.25
Machine-shop turnings	9.25 to 10.25
Mixed borings and turnings	9.25 to 10.25
Iron and steel pipe (1 in. diam., not under 2 ft. long)	9.75 to 10.25
Stove plate	11.25 to 11.75
Locomotive grate bars	11.50 to 12.00
Malleable cast (railroad)	11.00 to 11.50
Cast-iron car wheels	13.50 to 14.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast	$18.50 to $19.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	16.50 to 17.00
No. 1 heavy cast, not cupola size	14.00 to 14.50
No. 2 cast (radiators, cast boilers, etc.)	12.00 to 12.50

British Iron and Steel Market

Export Premium on Pig Iron Dropped—America Gets Glasgow Tramway Order

LONDON, ENGLAND, Aug. 29 (*By Cable*).

There have been further American purchases of Cleveland, Scotch and Midland pig iron. Cleveland producers have dropped the export premium on No. 3.

The United States Steel Products Co. has secured the contract for tramway material for Glasgow at £15,000. The lowest British tender was £18,000.

Wales has secured orders for 250,000 boxes of oil plates for Eastern markets at 19¼s. ($4.29) basis, f.o.b., October to December.

The Otis Steel Co., Cleveland, has placed an order with the Mackintosh-Hemphill Co. for a 40-in., two-high reversing blooming mill for its new steel plant.

St. Louis

Granite City Company Ships Pig Iron to Pennsylvania and Other Distant Points

ST. LOUIS, Aug. 29.

Pig Iron.—The scarcity of pig iron was emphasized by the sales last week of the Granite City maker for shipments to points logically served by other territories because of freight rates. They sold 3000 tons of low silicon, off grade iron for Wisconsin delivery at a high price; another lot of considerable tonnage for Indiana delivery; another lot of considerable tonnage for Pennsylvania delivery and several small lots for Ohio and Indiana delivery. For this iron the makers obtained the full market price f.o.b. furnace at Granite City, without allowance for freight differential. No other Northern iron was obtainable, largely due to the coal situation. As for Southern iron, there is a serious situation because of the railroad strike. With the exception of a car or two that trickles through owing to sheer luck, there are no arrivals from the South. A Sheffield producer sold two lots, 500 tons and 200 tons respectively. The market may be said to be $30, Chicago, for Northern iron for prompt shipment, with neither buyers nor sellers inclined to make contracts for forward delivery because of the uncertainty of conditions. Southern iron has been sold at prices ranging from $22 to $24, f.o.b. Birmingham. Those who have made purchases are pressing for deliveries. A southern Illinois car company is in the market for 1000 tons of Northern iron. Perhaps there would be more inquiries, but consumers realize conditions and the difficulties in getting iron. Lake Superior charcoal iron has advanced $3 a ton, making the market $33 at the furnaces. There is an inquiry before the market for 300 tons of 80 per cent ferrosilicon.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago and $5.17 from Birmingham and 81 cents average switching charge from Granite City:

Northern foundry, sil. 1.75 to 2.25	$32.16
Northern malleable, sil. 1.75 to 2.25	32.16
Basic	32.16
Southern foundry, all rail, sil. 1.75 to 2.25	$27.17 to 29.17

Finished Iron and Steel.—Fabricators report that there has been a brisk demand for their products within the last few days. This situation they attribute to the prospect for an advance in steel, following the announcement of the wage increase in the steel trade. The most important letting for several weeks went to the Mississippi Valley Structural Steel Co., being 1500 tons of structural steel for the new plant of the National Enameling & Stamping Co., Granite City. The award of 1200 tons for the shops of the Louisiana & Arkansas Railway at Stamps, Ark., went to the Virginia Bridge & Iron Co. The most important pending business is the South Side High School, St. Louis, involving about 300 tons of structural steel and 500 tons of reinforcing bars. No new business is being developed in sheets, and warehouses are not crowding manufacturers for deliveries. With the renewal of operations in southern Illinois coal mines, have come a number of inquiries for light rails. Implement manufacturers are showing some interest in buying, and are pressing for deliveries of purchases previously made. Fifteen of the mills of the Granite City steel works have reopened. Warehouses have advanced the price of sheets.

For stock out of warehouse we quote: Soft steel bars, 2.70c. per lb.; iron bars, 2.70c.; structural shapes, 2.80c.; tank plates, 2.80c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, cold rolled, one pass, 4.85c.; cold drawn rounds, shafting and screw stock, 3.50c.; structural rivets, $3.35 per 100 lb.; boiler rivets, $3.45; tank rivets, 7/16 in. and smaller, 60 per cent off list; machine bolts, large, 50 and 10 per cent; small, 50-10 and 10 per cent; carriage bolts, large, 55-5 per cent; small, 60 and 10 per cent; lag screws, 60 per cent; hot pressed nuts, square or hexagon blank, $3.50; and tapped, $3.25 off list.

Coke.—The settlement of the coal strike in southern Illinois has had no effect so far in solving the shortage of coke in this territory. Users still are depending largely upon local by-product plants for their supply, although some by-product coke made in Terre Haute is being sold here. There is virtually none to be had from the South because of the railroad situation, and only an occasional car gets through.

Old Material.—The market for old material continues to advance, demand and a lack of supplies shooting prices up as high as $2 a ton. Stocks in hands of dealers are being depleted, and very little material is coming; none at all from the railroads, as they are without the labor necessary to handle it. A number of sales of large tonnage were made during the week.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Old iron rails	$17.75 to $18.75
Rails for rolling	18.00 to 18.50
Steel rails less than 3 ft.	17.50 to 18.00
Relaying rails, standard section	26.00 to 29.00
Cast iron car wheels	20.00 to 20.50
No. 1 heavy railroad melting steel	17.50 to 18.00
No. 1 heavy shoveling steel	17.00 to 17.50
Ordinary shoveling steel	16.50 to 17.00
Frogs, switches and guards cut apart	16.25 to 16.75
Per Net Ton	
Heavy axle and tire turnings	11.50 to 12.00
Steel angle bars	15.25 to 15.75
Iron car axles	25.00 to 25.50
Steel car axles	19.00 to 19.50
Wrought iron bars and transoms	20.50 to 21.00
No. 1 railroad wrought	14.50 to 15.00
No. 2 railroad wrought	13.50 to 14.00
Railroad springs	18.00 to 18.50
Steel couplers and knuckles	18.00 to 18.50
Cast iron borings	11.00 to 11.50
No. 1 busheling	13.00 to 13.50
No. 1 railroad cast	18.50 to 19.00
Railroad malleable	15.50 to 16.00
Machine shop turnings	9.50 to 10.00

Birmingham

Rapid Advance of Pig Iron Continues in the South

BIRMINGHAM, ALA., Aug. 29.—Firm offers of $24 for October and November iron in lots of 1000 tons were made to-day and two lots of 500 tons each for the same delivery were booked yesterday at the same price. Some makers will not accept $24. All spot business is on a base of $25 with an enormous tonnage being turned down on account of embargoes. The spot market is $25 and fourth quarter $24 to $25 to-day.

Pig Iron.—The abrupt advance of Birmingham spot iron from a base of $20 and $21 to $23 and $25 between Saturday, Aug. 19, and Monday, Aug. 21, was among the most spectacular feats of this market in several years. Before the middle of the week, no spot iron was being sold under $25. The tonnage booked was not large because in the majority of instances where iron was applied for the makers saw impossibility of making spot delivery; so they declined the business. No fourth quarter iron worth speaking of came to the fore during the week. What was brought to the surface was business quoted on prior to that time, but closed during the week. One lot of 200 tons for fourth quarter brought $25. The Birmingham makers are holding aloof from the fourth quarter market for the remainder of what they have unsold and waiting on a firmer basis than the excited current one. Raises of wages by the Steel Corporation followed by that of the Alabama coal operators have served to bolster the idea of $24 to $25 base for fourth quarter. The most significant sales have been those of Sheffield iron of the Sloss-Sheffield Steel & Iron Co. from its Providence, R. I., yards, first at $30 base and then at $35, Providence base. The rail rate from Birmingham is $9.60, but rail and water is $7.67.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	$23.00 to $25.00
Basic	22.00 to 24.00
Charcoal, warm blast	32.00 to 34.00

Finishing Mills.—There has been no change in practically a 100 per cent production in Alabama finishing mills with the exception of the Conners Steel Co.'s reducing from two to one mill. The Tennessee company continues double turn at Bessemer, Ensley and Fairfield mills and 100 per cent of ingot capacity. The 20 per cent wage advance effective Sept. 1 will affect approximately 8000 employees of the Tennessee company and 2000 employed in other steel mills. The Tennessee company's lead was generally followed throughout the Birmingham district and in Alabama.

Cast Iron Pipe.—Several orders for good tonnages of pressure pipe followed the advance from the base of $37 to that of $38.50, the American Cast Iron Pipe Co. booking 600 tons for Martinsville, Ohio, and North Carolina towns placing several orders with the United States Cast Iron Pipe & Foundry Co. Sanitary pipe is firm at $65 and a lot of new business has been booked. Stocks are piling, but operations have not been curtailed.

Coal and Coke.—Alabama coal operators, following the lead of the Tennessee company's wage advances and adjustments, have announced a mine wage advance of approximately 20 per cent effective Sept. 1 and affecting 27,000 men. Spot coal rules from $3.50 up and spot coke rules at $7 to $10 with an especially large business done at $8. New England is taking a large tonnage of coke at $8 via steamers out of Southern ports. The Western distress demand is as great as ever, but the car and locomotive situation grows worse and production has not gotten beyond 400,000 tons on a call for fully 500,000 tons a week.

Old Material.—The scrap market is stronger and if the present spot prices for pig iron find themselves in the price for fourth quarter metal scrap will rise materially. Yard men are inclined to hold for advances over the present quotations and small consumers are paying from $1 to $2 over the scale for spot deliveries.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails	$13.00 to $15.00
No. 1 steel	12.00 to 15.00
No. 1 cast	15.00 to 16.00
Car wheels	15.00 to 16.00
Tramcar wheels	14.00 to 15.00
Stove plate	13.00 to 14.00
Cast iron borings	6.00 to 7.00
Machine shop turnings	4.00 to 5.00

De Lavaud Process Tested

BIRMINGHAM, ALA., Aug. 28.—The De Lavaud pipe casting machines installed at the North Birmingham plant of the United States Cast Iron Pipe & Foundry Co. have been tested on 6, 8- and 10-in. sizes of pipe and the tests have been more than satisfactory to factory experts. Presumably tests on 12-in. sizes will also be satisfactory. This pipe is now practically ready for the market and early announcement to that effect is expected together with price schedules.

Cincinnati

Pig Iron Prices Advance $3 to $5 Per Ton—Very Little Is Obtainable

CINCINNATI, Aug. 28.—Steadily advancing prices with a steady diminution of the available supply of pig iron featured the market during the week. While practically all inquiries are for prompt shipment, a number of melters have tested the market for fourth quarter delivery, and the net result of their efforts has been to get quotations from about two furnaces in the entire country. Should improvement in the railroad situation be delayed for a month or six weeks, many in the trade are looking for a return of the high prices prevailing in the early part of 1920.

Pig Iron.—The available supply of pig iron is very small. There is very little coming in from the South, though occasional shipments are being made by furnaces using the river and rail route. Northern furnaces are in better shape as regards transportation, but cannot begin to take care of the needs of their customers, as practically all of them are now sold up for the entire third quarter. Prices are from $3 to $5 higher than last week, and sales of Southern iron have been made as high as $27, Birmingham. The market, however, can be quoted at $23 to $25, the former price having been named by at least two furnaces for fourth quarter, while the latter applies to September shipments. Included in sales are one of 700 tons and one of 1000 tons, both at the minimum figure quoted above. Southern

Ohio iron, in carload lots, brought $33, Ironton base, last week, but on a 500-ton sale $30 was done. This interest has since raised its price to $31 for prompt shipment, and has taken 300 tons at this figure. One silvery furnace has advanced its price on 8 per cent to $41.50, but we note a sale of 1000 tons and 700 tons respectively for fourth quarter at $37.50 for 8 per cent, and this can still be done. Other sales of Northern foundry iron include two lots of 1000 tons each to a radiator company, 500 tons of malleable, and several ranging from 100 to 300. An inquiry for an unstated tonnage for fourth quarter and first quarter of next year is current from a piano plate manufacturer, and a central Ohio malleable foundry is asking for 500 tons for the fourth quarter. Jisco silvery furnace is scheduled to go in blast Sept. 15.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$27.05 to $29.05
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	27.55 to 29.55
Ohio silvery (nominal), 8 per cent	39.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	33.77 to 35.77
Basic Northern	28.77
Malleable	33.77 to 35.77

Finished Material.—It is becoming more difficult to place orders for finished materials, as mills are not in a position to make deliveries, and with uncertainty of future operations, are advising buyers that for the present at least all energies will be devoted to clearing up orders now on the books. There continues to be a good demand for early delivery, and many consumers are anxious to place orders for fourth quarter. Prices are steadily advancing, a fair tonnage of plates for immediate delivery having been placed with a Valley mill at 2.15c. On bars and shapes 2c. to 2.10c. for delivery within eight to ten weeks has been quoted, but 2c. seems to be the prevailing price for indefinite delivery. Some sheet mills have been taking small orders for early delivery on the basis of 2.60c. for blue annealed, 3.50c. for black and 4.50c. for galvanized, but are not quoting these prices through the fourth quarter. The American Sheet & Tin Plate Co. has taken a fair tonnage of fourth quarter business at its recently announced prices. While the American Steel & Wire Co. has not yet met advances of independent companies in nail and wire prices, it is expected that an announcement will be made shortly advancing wire products approximately $4 per ton. Tank builders in the district are busy, as are railroad equipment companies on repair work. The Indiana Railroad Co. is inquiring for 500 tons of 100-lb. A.E.R.A. rails for delivery at Indianapolis. It is expected that the Louisville & Nashville Railroad will shortly issue an inquiry for 25 locomotives, for use on the Corbin, Ky., branch. The demand for reinforcing bars continues good, an inquiry having been received for 500 tons for a stadium for the University of Illinois at Champaign, Ill., the general contract for which has been awarded. A warehouse at Covington, Ky., will take approximately 200 tons of bars, and miscellaneous inquiries for smaller buildings total in the neighborhood of 1000 tons. A number of new projects appeared in the structural field, the principal one being the new plant for the Fay & Egan Co., Cincinnati, bids for which will be received until Sept. 11. This project will take approximately 900 tons.

Warehouse Business.—Local jobbers report business continuing in good volume, with inquiries being received from many points outside the district. Light angles and reinforcing bars are very active, and black and galvanized sheets are moving well. Nails are also in fair demand. There have been no further price changes, although it is expected that black and galvanized sheets will be advanced approximately $4 a ton during the coming week, with nails taking a 15c. advance on Sept. 1.

Cincinnati jobbers quote: Iron and steel bars, 2.85c. base; reinforcing bars, 2.95c. base; hoops, 3.85c. base; bands, 3.60c. base; shapes and plates, 2.95c. base; cold-rolled rounds, 3.65c. base; cold-rolled flats, squares and hexagons, 4.15c. base; No. 10 blue annealed sheets, 3.75c.; No. 28 black sheets, 4.50c.; No. 28 galvanized sheets, 5.50c.; No. 9 annealed wire, $2.70 per 100 lb.; common wire nails, $2.85 per keg, base.

Coke.—Connellsville foundry coke is easier at $14 to $15. New River is quoted at $14 to $15; Wise County at $13, and Pocahontas at $14. Producers have named $11, Connellsville basis, as the price for September shipments, and the Indianapolis producer is holding its tonnage at $15, ovens. Southern coke is quoted at $8, ovens. We note one sale of 2000 tons and one of 700 tons to Michigan melters.

Old Material.—The scrap market is very strong and fairly active. A district steel plant purchased a round tonnage of open-hearth grades last week, and a better demand from outside districts is also reported. Scarcity of pig iron is also creating a demand for machinery cast. Prices generally are higher and dealers are of the opinion they may go even higher. Shipments are becoming increasingly scarce, but yard stocks are in fair shape.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

Per Gross Ton	
Bundled sheets	$9.50 to $10.00
Iron rails	15.50 to 16.00
Relaying rails, 50 lb. and up	26.50 to 27.00
Rails for rerolling	14.50 to 15.00
Heavy melting steel	14.50 to 15.00
Steel rails for melting	14.00 to 14.50
Car wheels	16.50 to 17.00
Per Net Ton	
No. 1 railroad wrought	13.00 to 13.50
Cast borings	10.00 to 10.50
Steel turnings	9.00 to 9.50
Railroad cast	16.00 to 16.50
No. 1 machinery	19.00 to 19.50
Burnt scrap	10.50 to 11.00
Iron axles	19.50 to 20.00
Locomotive tires (smooth inside)	12.50 to 13.00
Pipes and flues	7.50 to 8.00

Boston

Sales of Foreign Iron Increase as Alabama Furnaces Retire from Market

BOSTON, Aug. 29.

Pig Iron.—The withdrawal of Alabama furnace interests from the market reduced sales of Southern iron to a minimum the past week. Sales of foreign iron increased as a result, amounting to 6000 to 7000 tons. One house sold 2800 tons of "Continental," silicon 2.25 to 2.75 iron, October and November shipment, at $26.75 c.i.f. Boston, and French was offered at $24 to $25 and English at $25.50 to $27 c.i.f. here. Most of the iron sold in this territory, however, was No. 3 Scotch at $29 and $32, and higher silicon at $33, c.i.f. Boston, prices quoted last week. Local houses are informed Scotch iron supplies for September shipment are now limited due to purchases by Germany, so no weakening in values is anticipated. Boston firms the past week also sold English silicon 2.50 plus to Cincinnati melters at $32 c.i.f. dock here, and Scotch and English silicon 3.50 plus to western New York foundries at $33, September shipment, several thousand tons being involved. Sales for the week included more than 500 tons of Lake charcoal iron at $33 furnace base, an advance of $3, and small tonnages of Alabama high silicon spot iron at $25 furnace base, an advance of $5, as well as small tonnages of Alabama at $35 dock Providence, R. I., where the movement is hampered by a lack of cars. Several large tonnages, including one for 2000 tons Belgian or Alabama from a textile machinery maker, and many small lots are under negotiation.

We quote delivered prices, on the basis of the latest reported sales, now infrequent, and as follows, having added to furnace prices $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75	$36.15 to $37.15
East. Penn., sil. 1.75 to 2.25	35.65 to 36.65
Buffalo, sil. 2.25 to 2.75	40.41
Buffalo, sil. 1.75 to 2.25	39.91
Alabama, sil. 2.25 to 2.75	31.10 to 35.10
Alabama, sil. 1.75 to 2.25	30.60 to 34.60

Warehouse Business.—Warehouse prices on iron and steel are mixed. The two largest interests hold to $2.85½ for steel bars. One fairly important house is on a $3 base, and most of the others are asking as much on those sizes in small supply. For instance, stocks of ¼ in., ⅝ in. and 1 in. steel rounds are badly broken, and a majority of the trade quotes these sizes at $3. Popular sizes of flats, as well as 1⅛ in. and 1¼ in. angles are in short supply, and generally quoted at

(*Continued on page* 570)

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Plates

Sheared, tank quality, base, per lb.....2.00c. to 2.25c.

Structural Material

Beams, channels, etc.....2.00c. to 2.25c.

Iron and Steel Bars

Soft steel bars, base, per lb.....1.90c. to 2.25c.
Refined iron bars, base, per lb.....2.35c.

Hot-Rolled Flats

Hoops, base, per lb.....2.75c.
Bands, base, per lb.....2.75c.
Strips, base, per lb.....2.75c.
Cotton ties, per bundle of 45 lb.....$1.11

Cold-Finished Steels

Bars and shafting, base, per lb.....2.25c. to 2.50c.
Strips, base, per lb.....4.25c.

Wire Products

Nails, base, per keg.....$2.40 to $2.60
Bright plain wire, base, per 100 lb..... 2.25 to 2.35
Annealed fence wire, base, per 100 lb..... 2.25 to 2.35
Galvanized wire, base, per 100 lb..... 2.75 to 2.85
Galvanized barbed, base, per 100 lb..... 3.05 to 3.15
Galvanized staples, base, per keg..... 3.05 to 3.15
Painted barbed wire, base, per 100 lb..... 2.55 to 2.65
Polished staples, base, per keg..... 2.55 to 2.65
Cement coated nails, base, per count keg.....1.90c. to 2.10c.
Woven fence, carloads (to jobbers).....73 per cent off list
Woven fence, carloads (to retailers)....70½ per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads, 60, 10 and 10 per cent off list
Machine bolts, small, cut threads....60 and 10 per cent off list
Machine bolts, larger and longer.....60 and 10 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads.60 and 10 per cent off list
Cut threads.....60 per cent off list
Longer and larger sizes.....60 per cent off list
Lag bolts.....60, 10 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.:
Smaller and shorter.....50 and 10 per cent off list
Larger and longer sizes.....50 and 10 per cent off list
Hot pressed square or hex. blank nuts.....$4.50 off list
Hot pressed nuts, tapped.....$4.50 off list
C.p.c. and t. sq. or hex. nuts, blank.....$4.00 to $4.50 off list
C.p.c. and t. sq. or hex. nuts, tapped....$4.00 to $4.50 off list
Semi-finished hex. nuts:
9/16 in. and smaller, U. S. S..80 to 80 and 10 per cent off list
⅝ in. and larger, U. S. S., 75 to 75 and 10 and 10 per cent off list
Small sizes, S. A. E.....80, 10 and 10 per cent off list
S. A. E. ⅝ in. and larger..75 and 10 and 10 per cent off list
Stove bolts in packages.....80 and 5 per cent off list
Stove bolts in bulk.....80, 5 and 2½ per cent off list
Tire bolts.....65 per cent off list

Cap and Set Screws

Milled square and hex. head cap screws, 75 and 10 per cent off list
Milled set screws.....75 per cent off list
Upset cap screws.....80 per cent off list
Upset set screws.....80 and 5 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb., $2.65 to $3.00
Large boiler rivets, base, per 100 lb..... 2.75 to 3.10
Small rivets.....70 per cent off list

Track Equipment

Spikes, 9/16 in. and larger, base, per 100 lb.....$2.75
Spikes, ½ in. and smaller, base, per 100 lb..... 3.25
Spikes, boat and barge, base, per 100 lb..... 3.25
Track bolts, base, per 100 lb.....$3.50 to 3.75
Tie plates, per 100 lb..... 2.25
Angle bars, base, per 100 lb..... 2.40

Welded Pipe

Butt Weld

Steel			*Iron*		
Inches	Black	Galv.	Inches	Black	Galv.
⅛	51½	26	¼ to ⅜.....	+ 1½	+27½
¼ to ⅜.....	57	31½	½	31½	13½
½	62	48½	¾	37½	22½
¾	66	54½	1 to 1½.....	39½	24½
1 to 3.....	68	56½			

Lap Weld

2	61	49½	2	34½	20½
2½ to 6.....	65	53½	2½ to 6.....	37½	24½
7 to 8.....	62	49½	7 to 12.....	35½	22½
9 to 12.....	61	48½			

Butt Weld, extra strong, plain ends

⅛	47½	31	¼ to ⅜.....+	9½	+42½
¼ to ⅜.....	53	36½	½	30½	18½
½	59	48½	¾	37½	23½
¾	64	53½	1 to 1½.....	39½	25½
1 to 1½.....	66	55½			
2 to 3.....	67	56½			

Lap Weld, extra strong, plain ends

2	59	48½	2	35½	22½
2½ to 4.....	63	52½	2½ to 4.....	38½	26½
4½ to 6.....	62	51½	4½ to 6.....	37½	25½
7 to 8.....	58	45½	7 to 8.....	30½	18½
9 to 12.....	52	39½	9 to 12.....	25½	13½

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 and 2½ per cent.

Boiler Tubes

Lap Welded Steel		*Charcoal Iron*	
1¾ in.	23½	1½ in.	+2
2 to 2¼ in.....	38	1¾ to 1⅞ in.....	8
2½ to 3 in.....	49	2 to 2¼ in.....	18
3¼ to 13 in.....	54	2½ to 3 in.....	23
		3¼ to 4½ in.....	25

To large buyers of steel tubes a supplementary discount of 5 per cent is allowed.

Standard Commercial Seamless Boiler Tubes

Discounts on cold-drawn tubes in carload lots, f.o.b. Pittsburgh, follow:

1 in.	57	2½ and 2¾ in.....	40
1¼ and 1½ in.....	49	3 in.	44
1¾ in.	33	3½ to 4 in.....	49
2 and 2¼ in.....	36	4¼ in. and 5 in.....	41

Hot Rolled

3 in.	46	3¼ to 4 in.....	51

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30, base, 85 per cent off list. Carbon 0.30 to 0.40, base, 83 per cent off list. Plus usual differentials and extras for cutting.

Seamless Locomotive and Superheater Tubes

Cents per Ft.		Cents per Ft.	
2-in. O.D. 12 gage.....13		2¼-in. O.D. 10 gage....17¾	
2-in. O.D. 11 gage.....14		3-in. O.D. 7 gage.....33	
2-in. O.D. 10 gage.....15		1½-in. O.D. 9 gage.....13	
2¼-in. O.D. 12 gage....15		5⅜-in. O.D. 9 gage.....51	
2¼-in. O.D. 11 gage....16		5½-in. O.D. 9 gage.....53	

Tin Plate

Standard cokes, per base box.....$4.75

Terne Plate

(Per package, 200-lb.)

8-lb. coating	$9.30	25-lb. coating I. C.....$14.25	
8-lb. coating I. C.....	9.60	30-lb. coating I. C.....	15.25
15-lb. coating I. C.....	11.80	35-lb. coating I. C.....	16.25
20-lb. coating I. C.....	13.00	40-lb. coating I. C.....	17.25

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....2.50c. to 2.60c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.35c. to 3.50c.

Galvanized

No. 28 (base), per lb.....4.35c. to 4.50c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.35c. to 3.50c.

Manufacturers have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic.	$0.325	Buffalo	$0.265	St. Louis	$0.43
Philadelphia, export...	0.265	Cleveland	0.215	Kansas City	0.735
Baltimore, domestic...	0.315	Cleveland, Youngstown Comb.	0.19	Kansas City (pipe)...	0.705
Baltimore, export.....	0.255	Detroit	0.295	St. Paul	0.595
New York, domestic...	0.34	Cincinnati	0.295	Omaha	0.735
New York, export.....	0.285	Indianapolis	0.31	Omaha (pipe)	0.705
Boston, domestic	0.365	Chicago	0.34	Denver	1.275
Boston, export	0.285			Denver (pipe)	1.215

Pacific Coast	$1.50
Pac. Coast, ship plates	1.20
Birmingham	0.69
Memphis	0.385
Jacksonville, all rail..	0.50
Jacksonville, rail and water	0.415
New Orleans	0.515

The minimum carload to most of the foregoing points is 36, 000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha, and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 30c. to 40c.; ship plates, 30c. to 40c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 30c. to 40c.; sheets and tin plates, 50c.; rods, wire rope, cable and strands, 75c.; wire fencing, netting and stretcher, 50c.; pipe, not over 8 in. in diameter, 50c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb

Iron and Steel Markets

(*Concluded from page* 568)

advanced prices. Warehouses are well covered on small sizes, but mills are unable to make shipments. Some substitution of iron for steel bars is noted. Local wire nail prices remain unchanged notwithstanding reports of a shortage before the turn of the year. Some firms have more bolt and nut business than they can properly handle, while others say the movement out of stock is only fair at best.

Jobbers quote: Soft steel bars, $2.85½ per 100 lb. base; flats, $3.50½; concrete bars, $3 to $3.13; structural steel, $2.85½ to $3.05½; tire steel, $4.25 to $4.60; open-hearth spring steel, $4.50 to $6; crucible spring steel, $11.50; steel bands, $4; hoop steel, $4.50; cold rolled steel, $3.65 to $4.15; refined iron, $2.85½; best refined iron, $4.25; Wayne iron, $5.50; Norway iron, $6 to $6.50; plates, $2.95½ to $3.15; No. 10 blue annealed sheets, $4 per 100 lb. base; No. 28 black sheets, $5.15; No. 28 galvanized sheets, $6.15.

Soil Pipe.—New England makers of soil pipe have advanced prices $7 a ton, as compared with $6 by the big producers. No letup in the demand for this product is noted. Pennsylvania and other makers outside this territory are reported considerably behind on deliveries, while New England makers are in a position to make spot deliveries, which accounts for the higher prices quoted by them. The general market on soil pipe is 33, 10 and 5 per cent discount from list prices.

Coke.—New business in foundry coke is confined to English and Alabama brands, both the New England Coal & Coke Co. and the Providence Gas Co. confining activities to contract deliveries on a basis of $16.50 delivered where the local freight does not exceed $3.10. Several thousand tons of English coke sold the past week on a basis of $15 to $16 c.i.f. dock here, both to New England and New York State foundries. The steamship Norfolk Maru with a cargo of English coke is due shortly and the Maron Lovatt is loading abroad this week for Boston. A cargo of Sloss by-product foundry coke is loading for New England and is expected to arrive within two weeks. This coke is offered at $19 delivered subject to prior sale and confirmation. Present plans call for shipments of 50,000 tons of this Alabama coke into New England this year, deliveries to be made at Bridgeport, Conn., Providence, R. I., Boston, and Portland, Me.

Old Material.—Dealers' prices for old material at yards are firmer on expectations of increased business within the next two months. Little material is coming out and floating supplies are easily absorbed, but the market really is less active than it was a week ago. New inquiries from Pennsylvania mills have dropped to unimportant tonnages, and New England users, generally speaking, have enough stock on hand or on contract to cover requirements the rest of 1922. Heavy melting steel the past week sold in a small way at $17, Pittsburgh, which brings the local price down to around $11.50. Within the last few days, dealers have offered $12 on cars, shipping point. The demand for mixed borings and turnings has dropped almost to the vanishing point, following the withdrawal of a West Virginia mill from the market. Rejections are exceptionally heavy, according to local dealers. Chemical borings are in demand, dealers in some instances offering as high as $12.50 on cars, shipping point, for them. Shafting also is wanted, but consumers refuse to raise bids, and sales therefore are restricted. New England foundries continue to show little interest in cast scrap.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$19.00 to $20.00
No. 2 machinery cast	17.00 to 18.00
Stove plate	15.00 to 16.00
Railroad malleable	15.50 to 16.50

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$11.50 to $12.00
No. 1 railroad wrought	12.50 to 13.00
No. 1 yard wrought	10.00 to 11.00
Wrought pipe (1-in. in diam., over 2 ft. long)	8.50 to 9.00
Machine shop turnings	8.50 to 9.00
Cast iron borings, rolling mill	9.50 to 10.00
Cast iron borings, chemical	11.50 to 12.50
Blast furnace borings and turnings	8.75 to 9.50
Forged scrap and bundled skeleton	8.00 to 8.50
Street car axles	17.50 to 18.00
Shafting	16.00 to 16.50
Rerolling rails	11.00 to 12.00
Street car wheels	13.50 to 14.00

San Francisco

Moderate Trading in Foreign Iron and Coke —Price Trend Is Upward

SAN FRANCISCO, Aug. 23.

Pig Iron.—The market on the Coast has not shown any great expansion of activity during the past fortnight. A moderate business in foreign iron has been done, perhaps around 1000 tons for Los Angeles and San Francisco together. This tonnage comprises both English and Belgian materials, and is for late August, early September delivery. It is understood prices were around $29, ex-ship, coast ports. At present there appears to be an upward trend in prices of foreign pig iron, probably resulting from higher exchange rates and firmness in original markets. Domestic material is still neglected here, as prices and delivery favor the foreign. Foundries report a steady current business, but the volume of their operations does not seem to be materially larger than that which has been prevailing for several months.

Finished Iron and Steel.—A moderately good business is being done in iron and steel products along the Coast, perhaps the most consistent feature being the building industry. Reports from all parts of the State suggest a very satisfactory development in real estate construction, and in the urban centers the volume of large and medium commercial buildings, and the better class steel-frame apartment houses, is unusually large. Steel interests report a continuation of steady demand for structural materials, usually in moderate quantities. Local mills have advanced their prices on concrete reinforcing bars from $2.55 to $2.80, f.o.b. cars, San Francisco. The situation in the heavy materials is not particularly active, although some regular business is being handled. It seems that consumers are disposed to await the settlement of the strikes and other transportation uncertainties before taking on more stocks than are essential for current needs. Some items are reflecting the upward tendency in prices, but the Steel Corporation level on plates, shapes and sheets is fairly well adhered to, except by those interests which are offering prompt shipment at premiums.

Cast-Iron Pipe.—Quietness still pervades this market, possibly intensified by the industrial conditions of the country. Buyers are holding off, awaiting a settlement of difficulties. The only business of consequence has come from municipal sources. Los Angeles has just closed for 3000 tons of 4-6-8-in. pipe. Healdsburg closed last week for 145 tons of 4 to 8-in. Prices in some cases have been advanced about $1.50 per ton, making the new delivered price from $51.50 to $52 for 6-in. Shops are generally sold up for several months. Soil pipe factors are doing very little at present, as both buyers are hesitant and mills are not encouraging any volume of new business. No change in prices.

Coke.—Offerings of foreign material continue liberal, and buyers are taking steadily for their immediate needs. No particularly large sales were reported for the two-week period, but the total amount of business is estimated to aggregate some 1000 tons. This English coke is scheduled for late August and early September shipment. The price was close to $17.50, ex-ship. The foundry trade was the principal buyer. Domestic prices are quoted higher here, following strike developments, and beehive was named at as high as $12.50, f.o.b. ovens, West Virginia. By-product coke is held around $8.50, f.o.b. Birmingham. At these prices the amount of business transacted is very small.

Old Material.—Very little business is to be reported in scrap over the past two weeks. The regular routine requirements were taken care of, and that was about all. One merchant reports having sold three cars of cast iron scrap at $24 per net ton, delivered at consumer's plant; but it is understood that a firm offer would bring lower prices, as the market is generally considered from around $22 to $23. Heavy melting steel showed no activity of any consequence, but prices appear to be holding to the $11 level established a few weeks ago.

NON-FERROUS METALS

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
Aug.	Lake	Electro-lytic*	New York	New York	St. Louis	New York	St. Louis
23.....	14.12½	13.75	32.37½	5.90	5.55	6.60	6.25
24.....	14.12½	13.62½	32.12½	5.90	5.55	6.60	6.25
25.....	14.12½	13.62½	31.87½	5.90	5.55	6.60	6.25
26.....	14.12½	13.75	....	5.90	5.55	6.60	6.25
28.....	14.12½	13.75	32.05	5.90	5.55	6.60	6.25
29.....	14.12½	13.75	32.30	5.90	5.55	6.60	6.25

*Refinery quotations.

New York

NEW YORK, Aug. 29.

Moderate activity prevails in most of the markets and prices are steady to firm. Buying of copper is not heavy and prices are steady. The tin market is dull, with prices fluctuating with conditions in London. Buying of lead is steady and prices are firm. The market for prime Western zinc has stiffened slightly, but demand is not active.

Copper.—There is some hesitancy on the part of consumers to enter the market in a large way, but domestic demand is reported as fairly good. In the latter part of last week there was one producer which took some business at 13.87½c., delivered, but this situation no longer prevails and it is not possible to buy from first hands electrolytic copper at less than 14c., delivered, or 13.75c., refinery, the quotation which has prevailed for some time. There has been and still may be a little resale metal available at slightly under the market, but it is not an important factor. Some producers will not even sell at 14c., delivered, but are asking ⅛c. to ¼c. higher for any delivery this year. The business referred to as having been booked under 14c., delivered, last week is understood to have been for delivery not earlier than November. Lake copper continues unchanged at 14c. to 14.25c., delivered.

Tin.—The week as a whole has been a quiet one in Straits tin, total sales having amounted to not more than 500 tons, mostly prompt and nearby delivery, with the latter position neglected, although a little business was done in far-off shipments. Consumers are naturally hesitating in this as in other markets because of the coal and railroad situation. Prices for Straits tin here are generally below the cost to import and foreign sellers cannot compete with local sellers. A little business was done yesterday in spot Straits at 32c. to 32.12½c., most of it going at 32c. In the market to-day moderate sales of spot and nearby have been made at 32.25c. to 32.37½c., with the quotation for spot Straits at 32.30c., New York. The London market to-day was about £1 per ton less than a week ago, at £159 10s. for spot standard, £159 15s. for future standard and £160 for spot Straits. Arrivals thus far this month have been 3140 tons, with 5990 tons reported afloat.

Lead.—A moderate demand is reported by most sellers and the market is steady at the quotations prevailing a week ago, except that in the West the metal can be obtained in the outside market at 5.55c., St. Louis. The quotation in New York is the same for both the leading interest and independents at 5.90c., New York, but the quotation of the former at St. Louis is 15 points higher than the outside market at 5.70c.

Zinc.—Prime Western has advanced slightly during the week and is now quoted at 6.25c., St. Louis, and 6.60c., New York, as a minimum. The market is firm and business is light, consumers not entering the market to any great extent and producers disinclined to press their product. It is possible to buy prime Western to the end of the year at the same prices prevailing for the early positions. It is reported that prospects for coal in the zinc smelting districts of the West are none too good and there are those who fear a reduction in output.

Antimony.—The general situation is unchanged and wholesale lots for early delivery are quoted at 5.25c. per lb., duty paid, New York.

Aluminum.—Wholesale lots of virgin metal, 98 to 99 per cent pure, are quoted by the leading interest at 19.10c., f.o.b. plant, for early delivery, with the same grade of foreign metal obtainable from importing dealers at 17.75c. to 18c., duty paid.

Old Metals.—Business is quiet but values are fairly stationary. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	13.50
Copper, heavy and wire	12.75
Copper, light and bottoms	11.25
Heavy machine composition	10.50
Brass, heavy	8.25
Brass, light	6.50
No. 1 red brass or composition turnings	9.00
No. 1 yellow rod brass turnings	7.50
Lead, heavy	5.00
Lead, tea	4.00
Zinc	3.75

Chicago

AUG. 29.—While there has been no particular pressure to sell, business has been unsatisfactory and prices of lead, zinc and tin have weakened. The only recent buying of note has been the closing of first quarter business in copper at current prices. The failure of future buying to bring out a premium is an unfavorable sign. Old metal prices are unchanged. We quote, in carload lots, lake copper, 14.25c.; tin, 33c. to 33.50c.; lead, 5.65c.; spelter, 6.30c.; antimony, 7c., in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 11c.; copper bottoms, 9.25c.; red brass, 8.75c.; yellow brass, 6.75c.; lead pipe, 4.50c.; zinc, 3.50c.; pewter, No. 1, 20c.; tin foil, 22.50c.; block tin, 26c., all buying prices for less than carload lots.

St. Louis

Aug. 29.—Lead was stronger for the week, advancing 10 to 15 points to 5.65c. to 5.70c., car lots, while slab zinc was steady at 6.25c. to 6.35c. On old metals we quote light brass, 3.50c.; heavy red brass and light copper, 7c.; heavy yellow brass, 4c.; heavy copper and copper wire, 7.50c.; zinc, 2c.; lead, 3c.; pewter, 15c.; tin foil, 16c.; tea lead, 2c.; aluminum, 9c.

Wages of Puddlers Advanced

PITTSBURGH, Aug. 29.—The average price of bar iron shipments in the 60 days ended Aug. 20 as disclosed in the bi-monthly examination of the sales books of selected manufacturers in the Midwestern district at Youngstown yesterday was 1.70c. This is an advance of 10c. per lb. over the April-June average and means an increase of two points or 40c. per ton increase in the boiling rate to be paid in the September-October period. The new boiling rate is $8.93 per ton. Puddlers in the July-August period were paid $8.53 based on the 1.60c. card.

New Weirton Steel Mill

The Weirton Steel Co., Weirton, W. Va., which will soon start work on the construction of a new sheet mill, is expected to begin placing the contracts shortly for the mills and equipment. This plant is to consist of eight hot mills arranged in two trains of four mills, each train to be driven by 1200-hp. motor and also four cold mills. This plant will make black and galvanized and special sheets and will provide work for 600 additional men.

PERSONAL

Arthur J. Grey of New York has been appointed American Commodity Trade Commissioner in Berlin and will sail on the President Harding Sept. 6. His selection follows the policy of the Department of Commerce to select men who have a practical knowledge of various industries in order to promote the interests of American manufacturers to the greatest extent. Mr. Grey's appointment is of particular value to the machinery trade, as he has spent seven years in machine building, and in addition to this has devoted four years to law practice, dealing with technico-legal and commercial problems, such as immigration, unemployment and industrial conditions in New York. For nine years he taught machine construction and design and commercial law in the New York day and evening schools. For the past six years, Mr. Grey has been engaged in foreign trade, first as a traveling representative in France and Belgium for American companies, and later as principal with offices in New York, Paris and Buenos Aires. His early education was received in the public schools of New York and New Jersey. He graduated from New York University in 1898 with the degree of Bachelor of Laws and in 1912 received the degree of Bachelor of Science from the same institution. Until his departure for Europe, Mr. Grey is making his headquarters at the Bureau of Foreign and Domestic Commerce, Custom House, New York.

ARTHUR J. GREY

Frank E. Dyson, assistant general agent, Universal Winding Co., Providence, R. I., a position he held for 17 years, has resigned to devote his entire attention to the affairs of the Electrical Products Mfg. Co., of that city, of which he is president.

Donald R. Simonds, Arcade Malleable Iron Co., Worcester, Mass., has associated himself with the Boston office Rogers, Brown & Co.

H. Owesen, formerly mechanical engineer of the Apollo Steel Co., has become assistant chief engineer of the Youngstown Sheet and Tube Co., Youngstown, Ohio.

Gilbert H. Johnson, of Isaac G. Johnson & Co., iron founders, New York, has been elected to the board of directors of the Bank of America, New York.

G. A. Binz, sales manager of the American Steam Gauge & Valve Mfg. Co., Boston, was appointed sales manager also of Schaeffer & Budenberg Mfg. Co., Brooklyn, upon the consolidation of these two companies on Aug. 1.

W. Irving Bullard, vice-president E. H. Jacobs Mfg. Co., manufacturer of mill supplies, Danielson, Conn., will sail Sept. 30 for Rio de Janiero, Brazil, where he will attend the International Centennial Exposition as a delegate from the States of Connecticut and Massachusetts.

W. H. Cogswell, formerly with the Miller-Owen Electric Co., Pittsburgh, has become associated with H. F. Randolph, consulting electrical engineer, Oliver Building, Pittsburgh.

Charles A. Anderson, Jr., for the past five years in charge of the Philadelphia office, Pittsburgh Valve, Foundry & Construction Co., Pittsburgh, has been transferred to the home office and promoted to the position of assistant sales manager.

E. C. Griffiths and Don B. Graze have opened offices in the Marshall Building, Cleveland, as sales engineers under the name of Griffiths & Graze, and will handle electrical material for the M. B. Austin Co., Appleton Rubber Co., and S. H. Couch Co., Inc. Mr. Griffiths has been associated with the M. B. Austin Co., in the same territory for the past three years and Mr. Graze has devoted his attention to power apparatus in the same territory for the past nine years.

Prof. S. Timoshenko, recently of the Zagreb Polytechnic Institute of Jugo-Slavia, has joined the staff of the Vibration Specialty Co., Philadelphia, and is handling the work on elasticity of structures.

H. B. Reppetto, for many years connected with the stove manufacturing business at Wheeling, W. Va., has been made manager of the Regent Stove Co., Wyandotte, Michigan.

W. A. Shepard has resigned as secretary of the Consolidated Tool Works, Inc., 296 Broadway, New York, effective Sept. 1.

W. Clayton Farris has returned recently to New York from Japan, where he has been for three years with the Horne Co., Ltd. The first two years he spent in the Tokio office and during the remaining year he acted as manager of the Osaka branch. While in the United States, Mr. Farris will be at the New York office of the Horne Co., Ltd., 51 Chambers Street.

George Scherr of the George Scherr Co., 126 Liberty Street, New York, machine tools, left Aug. 26 on a business trip to Europe, through Italy, Austria and Germany. While in Europe his address will be care Messrs. Schuchardt & Schutte, 59 Spandauer Strasse, Berlin.

Thomas H. Wickenden and Charles McKnight, Jr., have recently joined the development and research department of the International Nickel Co., New York, to undertake development work in connection with alloy steels. Mr. Wickenden was for many years associated with the Studebaker Corporation as engineer-in-charge at the South Bend plant, and more recently associated with Zeder-Skelton-Breer Engineering Co. in a consulting capacity. Mr. McKnight was formerly works manager of the Carbon Steel Co. and engaged for many years in the production of alloy steels.

P. F. Merit, formerly vice-president of the Eastern Fuel Co., 302 Broadway, New York, has resigned. F. W. Prussen has been transferred from the New York office of this company to the traffic department in the main office, Frick Building, Pittsburgh.

Frank King has been made factory manager of the American Steam Truck & Car Co., Chicago, having resigned a similar position with the Dearborn Truck Co.

Harry Isenhart, formerly in charge of the Pittsburgh office, Bethlehem Steel Co., and later in the Buffalo office, Jones & Laughlin Steel Co., has joined the sales force of E. W. Mudge & Co., Pittsburgh.

Edward M. Adams, first vice-president and general manager of sales Inland Steel Co., Chicago, underwent an operation for appendicitis at St. Luke's Hospital, in that city, Aug. 28. His condition is reported to be satisfactory.

Engineers to Meet at Springfield

The Springfield, Mass., local sections of the American Society of Mechanical Engineers, in co-operation with the Engineering Society of Western Massachusetts and the Springfield Chamber of Commerce, will hold a regional meeting Sept. 25 to 27. The technical program will include sessions on paper, power, textiles and the machine shop.

Machine tool standardization, standardization of small tools, and a group of papers on the new alloys of aluminum, copper and nickel will be presented at the machine shop session.

Visits to educational institutions in Springfield and a visit to the industrial plants of Holyoke, Mass., are planned, a day being given over to an automobile trip through the Connecticut Valley to Greenfie'd, Mass.

OBITUARY

Death of Coleman Sellers, Jr.

COLEMAN SELLERS, JR., president of Wm. Sellers & Co., Inc., Philadelphia, died on Tuesday, August 15, in his 70th year after an illness of several months. His connection with the Sellers house, then a firm, began in 1873 on his graduation from the University of Pennsylvania. After serving a practical course in the shops for several years, he took a position in the drafting room of which he soon became the head. He was appointed assistant manager in 1887, becoming at the same time a director of the company. He was elected engineer in 1902 and president in May, 1905.

COLEMAN SELLERS, JR.

His forebears in the four preceding generations showed unusual mechanical and engineering ability. The first of them came to this country from Derbyshire, England, in 1682.

His father, Coleman Sellers, a member of the Sellers firm in 1873, was one of the most brilliant mechanical engineers of his time. Coleman Sellers, Jr., also was a man of parts and of liberal ideas, and while his principal inclinations and activities were in mechanical and engineering lines, he took keen interest in science, literature, education and the arts, and was active in the civic life of Philadelphia as well as in city, State and national betterments.

He was long active in the affairs of the Franklin Institute, of which he was vice-president at the time of his death. He was a member of the Board of Commissioners of Navigation of Pennsylvania, to which he was appointed in 1907. He took special interest in the work of the American Philosophical Society, the American Society of Mechanical Engineers, the American Society of Naval Architects and Marine Engineers, and the Engineers' Club of Philadelphia, of which he was one of the founders. He was president of the Chamber of Commerce from 1909 to 1913.

As chairman of a local draft board in the early stages of this country's entrance into the war he served with such fidelity and assiduity as seriously to impair his health.

Mr. Sellers was a man of charm, kind and considerate to all with whom he had contact, whatever their station in life. He had a special sympathy for the young men of his profession. His keen sense of humor was coupled with a most unusual fund of anecdote. He was quick in repartee, but never caustic or resentful; was sedate or gay, so that his presence in any gathering imparted an atmosphere suited to the occasion.

FRANK PERLEY HOWE died at his summer home in Bristol, R. I., Aug. 24, after an illness of nearly two years. He was in his 70th year and had lived most of his life in Philadelphia, which was his birthplace. After graduating at Brown University in 1872 he took a course in mining engineering at Lehigh University. For many years he had been a factor in the Eastern iron trade, having offices in Philadelphia but spending much time at Johnson City, Tenn., in connection with the operations of the Cranberry Coal & Iron Co. and the Cranberry Furnace Co., of which he was president in recent years, succeeding H. M. Howe. He was also president of the Eastern Tennessee & Western North Carolina Railroad, a line running from Johnson City, Tenn., to Cranberry, N. C. The furnace at Johnson City was well known in the trade as a producer of low phosphorus pig iron, which was made from the Cranberry ores brought from the adjoining State. Mr. Howe was for a number of years secretary and treasurer and later president of the Allentown Rolling Mill Co., Allentown, Pa. Other executive positions which he held at various times were the following: general manager Montour Iron & Steel Co., Danville, Pa.; president North Branch Steel Co., vice-president William Wharton Jr. & Co., president Philadelphia Roll & Machine Co.; also, for some years, president Musconetcong Iron Works, Stanhope, N. J. He was a member of the American Institute of Mining and Metallurgical Engineers.

LEWIS R. BLISS, president Ajax Iron Works, Corry, Pa., died at the Allegheny General Hospital, Pittsburgh, Aug. 26. He was born in Corry, Pa., 45 years ago, and had lived there all his life. He was active in the civic, business and fraternal circles in that city.

OLIVER A. BLACKBURN, president Eclipse Gas Coal Co., and also of the Pittsburgh Coal Producers' Association, died at the Columbia Hospital, Wilkinsburg, Pa., Aug. 25, following an illness of several months. He was born at Peters Creek, Pa., Nov. 9, 1862, but had been a resident of Pittsburgh most of his life.

JOHN STEPHANS, general manager since 1902 of the Inland Steel Co.'s plant at Indiana Harbor, Ind., died of apoplexy at his home in that city, Aug. 24. He was 78 years old.

THEODORE H. COLVIN, whose death at his home in Providence, R. I., Aug. 12, was recorded in THE IRON AGE of Aug. 24, was well known in the foundry trade. He was a charter member of the American Foundrymen's Association, serving one year as vice-president and during a part of the year as acting president. It was a great source of pride to him that he made his own career without any financial assistance from anyone. He was one of eight children brought up on a hilly farm of Connecticut, and had only six months' schooling at a country school. He started out from home at the age of 17 to work for a farmer at the rate of $12 a month and the next year went into the foundry to learn the trade which he followed until he started in business at about the age of 26 with money saved since starting to work. He always found ways of acquiring such education as he required in doing business notwithstanding his limited education, and never went to any school or employed teachers. He could keep books, figure the weights and strains of any casting, making them up to 25 tons wholly from blue prints without any pattern and he devised many methods of molding heavy work which were great improvements on former methods. He designed and built the foundry plant of the Colvin Foundry Co., and although it is 25 years old, it compares favorably with many jobbing foundry plants in that section of the country to-day. He seemed to have the ability to overcome all obstacles. He was at once a remarkable executive, a thorough mechanic, a successful financier, a deep thinker and one who took great pleasure in helping others.

THEODORE H. COLVIN

LEVY MAYER, prominent Chicago attorney and representative of the Inland Steel Co. in recent merger negotiations, died of heart failure in Chicago on Aug. 14, at the age of 63.

LOUIS C. STEGER, member of the board of directors and director of purchases and stores of S. F. Bowser & Co., Inc., Fort Wayne, Ind., died on Sunday, Aug. 20.

EDMUND S. CONANT, an auctioneer of national reputation and especially prominent in the New England machine tool field, died Aug. 26, at his home in Lowell, Mass.

Machinery Markets and News of the Works

AUGUST A QUIET MONTH

Some Centers Show Increased Activity—Prospects for September Good

Several Price Advances—Otis Steel Co. Inquires for Cranes and Other Equipment

In some centers, notably Cincinnati and Milwaukee, the business in August is expected to come well up to that of June and July. In New York, Cleveland and Pittsburgh on the other hand, purchases have not been up to the previous month. There is a definite feeling throughout the trade, however, that September will bring increased activity.

Several price advances are to be noted. The Landis Tool Co., Waynesboro, Pa., has announced a 10 per cent advance, effective Aug. 15, and the Warner & Swasey Co., Cleveland, will issue new lists Sept. 1 with further price advances. Increases ranging from 5 to 15 per cent have been made in turret machinery at Cincinnati, and announcements from other manufacturers in that district are expected. In the Pittsburgh district dealers have been notified by a maker of lathes of an increase of about 10 per cent.

The Otis Steel Co. has sent out inquiry for about 25 cranes for its new steel plant and is figuring on mills, furnaces and other equipment, some of which is expected to be placed shortly. This company purchased a 36 in. lathe and is inquiring for a 96 in. shear.

The General Electric Co., Schenectady, N. Y., is still in the market, and now has a list out for eight or 10 machines, and a Cleveland company which is expected to purchase 30 tools has asked quotations.

The Weirton Steel Co., Weirton, W. Va., will probably require equipment for a new sheet mill.

The Chesapeake & Ohio Railroad contemplates the purchase of tools, but no list has been issued.

The Public Service Department of Los Angeles is inquiring for a 15 and 20-ton single-motor crane, and the Department of State Railways, Santiago, Chile, is in the market for a 25-ton, two five-ton and two three-ton cranes, also two special ore chutes.

Railroad business is coming to a head and the resumption of railroad buying noted last week in connection with the Union Pacific and Illinois Central was stimulating to the trade. The Chicago, Burlington & Quincy, which has two lists before the trade, is expected to place orders for a large number of machines this week and to close for 11 cranes.

In view of the fact that these railroad inquiries have been pending for months, present buying is regarded in some quarters as an indication that the carriers are looking for general price advances.

While railroad orders will considerably expand the bookings of dealers they suffer in comparison with buying by automotive interests, which has been going on quietly since May. The automotive industry was the principle source of gain in Milwaukee and pending inquiry is said to forecast even better activity.

New York

NEW YORK, Aug. 29.

WHILE the machine-tool trade continues to look forward with confidence it can not be said that present conditions are satisfactory. Purchases of tools have dropped off materially during August as compared with June and July. The General Electric Co., Schenectady, N. Y., is still in the market and now has inquiries out for eight or ten machines, but otherwise there is very little activity except in single tools.

The Landis Tool Co., Waynesboro, Pa., has announced an advance of 10 per cent on its grinding machines and machine parts, effective Aug. 15.

The crane market is also quiet, there being few sales or inquiries.

The Department of State Railways, Santiago, Chile, is in the market for one 25-ton, two 5-ton and two 3-ton cranes and two special ore chutes, but it is not certain that the orders will come to the United States.

The Public Service Department, Los Angeles, Cal., is inquiring for one 15-ton and one 20-ton single-motor cranes.

The Southern California Edison Co. opened bids last week on a 100-ton power plant crane.

The Keystone State Construction Co., Philadelphia, has bought two used Brown Hoist locomotive cranes formerly owned by the Navy Department.

The Crampton Co., Kenilworth, Ky., contractor, has bought from Philip T. King, New York, a used 20-ton Brown Hoist locomotive crane.

Roehm & Davidson, Detroit, have bought a 5-ton, 75-ft. span, 3-motor crane from the Northern Engineering Works.

The city of Detroit has ordered a 15-ton Northern crane.

The Detroit Pressed Steel Co., Detroit, has bought a 5-ton electric crane from the Northern Engineering Works.

The Semet-Solvay Co. has bought two 1-ton electric traveling cranes from the Northern Engineering Works.

Charles L. Cadle, superintendent of Public Works, Albany, N. Y., has plans in progress for the construction of three drydocks and repair shops at the State Barge Canal divisions at Waterford, Baldwinsville and Pittsford, N. Y. The equipment will comprise yard cranes and other material-handling machinery.

John Arfman, 431 East Ninetieth Street, New York, will soon take bids for a one-story automobile service and repair building, 75 x 100 ft., at 1731 Avenue A, estimated to cost $100,000.

The Consolidated Machine Tool Corporation, 17 East Forty-second Street, New York, is disposing of a bond issue of $3,600,000, a portion of the proceeds to be used for extensions and improvements.

The Ohio Brass Co., 50 Church Street, New York, manufacturer of brass and other electrical equipment, with plant at Mansfield, Ohio, will commence the erection of a new plant at Niagara Falls, Ont.

Power equipment, conveying machinery, tanks, etc., will be installed in the new plant to be constructed on Foster Avenue, Long Island City, by the National Liquid Bleach Co., 18 Purvis Street, New York, estimated to cost about $500,000, with equipment.

The Eastern Sugar Corporation, a subsidiary of the Cuba Cane Sugar Corporation, 112 Wall Street, New York, has arranged for a bond issue of $10,000,000, a portion of the proceeds to be used for extensions and improvements, additions to working capital, etc.

Joseph R. Greenwood, Long Island City, has organized a company to manufacture enameled products and has leased a building at 66 Myrtle Avenue from the Commercial Research Corporation, for a plant and headquarters. The structure approximates about 25,000 sq. ft. of floor area.

The Standard Oil Co. of New York, 26 Broadway, is perfecting plans for a refinery at Sparkill, N. Y., where it recently acquired about 1500 acres. It is said that the new refinery will cost in excess of $1,000,000, with equipment.

The Imperial Oil Co. of Canada, a subsidiary of the Standard Oil Co. of New Jersey, 26 Broadway, New York, has plans under consideration for a new refinery at Calgary,

Alta., estimated to cost in excess of $2,000,000, including machinery.

Benjamin G. Hutchins, Inc., 990 East Thirty-fourth Street, Brooklyn, will make extensions in its two-story power house, at Avenue H and East Thirty-fifth Street, to cost about $25,000. Lockwood, Greene & Co., 101 Park Avenue, New York, are architects.

Loading and unloading machinery, conveying equipment, power elevators, and other mechanical apparatus will be installed in the new reinforced-concrete warehouse to be constructed at Long Island City, by James Butler, Inc., 391 Washington Street, New York, wholesale grocer, estimated to cost in excess of $1,500,000, for which bids on a general contract are now being taken. William Higginson, 21 Park Row, New York, is architect.

The American Yellow Taxi Operators, Inc., 119 West 145th Street, New York, has leased the building fronting on the East River, between Forty-ninth and Fifty-first Streets, now in course of erection, for a new service and repair works and garage.

The Koken-Chisholm Co., 178 Centre Street, New York, manufacturer of metal chairs and fixtures, will commence the erection of a two-story plant, 100 x 100 ft., at Willow Avenue and 134th Street, to cost about $65,000. Charles B. Chisholm is head.

A vocational department will be installed in the new high school to be erected at Arlington, Poughkeepsie, N. Y., for which preliminary plans are being prepared. The Union Free School District No. 7, John F. Hooper, president, Poughkeepsie, is in charge.

The Conley Tinfoil Co., 521 West Twenty-fifth Street, New York, has filed plans for a one-story works, 152 x 362 ft., at Glendale, L. I.

The Timken Roller Bearing Co., 230 West Fifty-sixth Street, New York, with plants at Canton and Columbus, Ohio, is disposing of a stock issue of $12,000,000, a portion of the proceeds to be used for extensions, improvements, etc., and general expansion. H. H. Timken is president.

Barnett Schacht & Sons, 279 East 148th Street, New York, operating a general iron works, will build a new one-story plant, 50 x 100 ft., on Timpson Place to cost about $30,000.

A vocational department will be installed in the new high school addition to be erected at Manhassett, L. I., estimated to cost about $250,000, for which bids have been asked on a general contract. F. H. Briggs, Plandome, L. I., is architect.

The Westchester Lighting Co., First Avenue and First Street, Mount Kisco, N. Y., will soon take bids for an automobile service and repair works for company trucks and cars, in connection with the new two-story, L-shaped storage building. May & Hilliard, 15 East Fortieth Street, New York, are architects.

Walter Butterfield, Wildwood, N. J., is said to be arranging a list of equipment for installation at his machine shop, now in course of completion.

The Technical Products Co., 300 Madison Avenue, New York, manufacturer of machine equipment, etc., has leased a portion of the building on Hudson Avenue near Twelfth Street, Hoboken, N. J., totaling about 10,000 sq. ft., for a new works.

The East Brunswick Mutual Power & Light Co., 40 Patterson Street, New Brunswick, N. J., has been organized with a capital of $125,000 to equip and operate an electric power plant and system in East Brunswick Township. Klemmer Kalteissen heads the company.

The Kessler Chemical Co., 575 Nassau Street, Orange, N. J., is in the market for one Yale & Towne duplex hoist, from 2 to 3-ton capacity.

The C. A. Buscham Mfg. Co., 1126 South Grove Street, Irvington, N. J., is in the market for a De La Vergne oil engine, about 40 hp.

A vocational department will be installed in the new high school to be erected at Somerville, N. J., two-stories, 55 x 205 ft., estimated to cost about $250,000, for which bids are now being taken. J. N. Pierson & Son, 175 Smith Street, Perth Amboy, N. J., are architects.

Schloss, Held & Schloss, foot of Astor Street, Newark, operating an abattoir, will build a new ice and refrigerating plant to cost $35,000. William E. Lehman, 738 Broad Street, is architect.

J. J. Henry Muller, 113 Springfield Avenue, Newark, will build a one-story automobile service and repair building, 30 x 150 ft., at 149 William Street, for automobile trucks and cars employed in his furniture business. A. M. Kleeman, 987 Springfield Avenue, is architect.

L. W. Brazier, Basking Ridge, N. J., is in the market for a 100 hp. return tubular boiler, low pressure, self-sustained.

Chicago

CHICAGO, Aug. 28.

RAILROAD business is suddenly coming to a head. As reported in THE IRON AGE of Aug. 24, the Union Pacific placed orders for about $200,000 worth of machine tools. The Illinois Central has completed negotiations for $250,000 worth of tools, exclusive of motors, the distribution of the confirming orders now being in progress. The Chicago, Burlington & Quincy is expected to place orders this week for a large number of machines. This road has two lists before the trade, one comprising 117 items for its new Denver shop, which was published in THE IRON AGE of June 29, and the other embracing seventy-eight items for existing shops at various points on the system, which appeared in our issue of May 1. The latter list has been cut down materially, but it is understood that the Denver equipment will be purchased in toto. In view of the fact that these railroad inquiries have been pending for months, present buying is regarded as an indication that the carriers are becoming apprehensive of general machine tool advances. While these orders will considerably expand the bookings of dealers, they suffer by comparison with buying by automotive interests which has been going on quietly since May. It is estimated that the Studebaker Corporation has thus far placed orders for metal working equipment involving close to $700,000, while the purchases by the Continental Motors Co. have also been large. In the latter case a considerable share of the business went to Detroit dealers, although by no means to the exclusion of Chicago sellers.

The Chicago, Burlington & Quincy is also about to close for eleven cranes, the inquiry for which was noted in our issue of June 12. Nine of these cranes are overhead electric travelling machines for the Denver, Col., shop, consisting of two 225-ton, three 15-ton, two 50-ton, and two 10-ton cranes. There are also two gantry cranes, 105 ft. between legs and 155 ft. overall to be bought for the Aurora, Ill. scrap yard of the road. The Atchison, Topeka & Santa Fe has placed a 10-ton hand power crane of 37 ft. span with the Whiting Corporation.

The Marshall Metal Corporation, 2608 South Wells Street, Chicago, recently incorporated with $100,000 capital stock, will manufacture a product known as Bull Dog metal, which will be used for welding aluminum. It will also manufacture steel wire brushes to be used in applying the metal. A plant containing 3000 sq. ft. of floor space has been leased at the address given. The company employs no metal-working machines, but operates coke forges, graphite crucibles, specially made molds and brush making machines. The officers are Frank E. Chamberlain president; John J. Stream, vice-president; John R. Marshall, treasurer; Harry B. Clapp, secretary.

The Atlas Copper & Brass Mfg. Co., 3740 High Street, Chicago, has let contract for a one-story machine shop, 50 x 123 ft., at 2742-4 High Street, to cost $12,000.

The Neely Printing Co., 412 Orleans Street, Chicago, has let contract for a three-story printing plant, 81 x 100 ft., 18 x 23 ft., and 34 x 34 ft., at 871-77 North Franklin Street, to cost $100,000.

E. J. Brach & Sons, confectioners, 215 West Ohio Street, Chicago, have had plans prepared by Alfred S. Alschuler, 28 East Jackson Boulevard, for a three-story factory, 100 x 300 ft., to be built in three units on a site bounded by Cicero, Austin, Kilpatrick Avenues and West Kinzie Street, to cost $1,000,000.

The Valentine Seaver Co., furniture manufacturer, 1721 Sedgwick Street, Chicago, has had plans prepared for a four-story factory, 103 x 171 x 272 ft., at George Street and North Crawford Avenue.

The Sandbo Mfg. Co. has opened a plant at 1518 Third Avenue, Moline, Ill., to manufacture automobile accessories and a patented pneumatic pump. The officers are A. I. Sandbo, Frank Maehr, Jr., and Thomas Sincox. Mr. Sandbo was the founder of the Bear Mfg. Co., Rock Island, and at present is vice-president of that corporation.

A recent gas tank explosion followed by fire resulted in $40,000 damage to the plant of the Stockland Road Machinery Co., 3327 Easy Twenty-seventh Street, Minneapolis, Minn. The blaze was confined to the paint shop and a section of the machine shop.

The Elgin Stove & Oven Co., 14 Chicago Street, Elgin, Ill., has plans under way for a new three-story plant at North State and Schiller Streets, estimated to cost about

$100,000. Frank D. Chase, Inc., 642 North Michigan Avenue, Chicago, is architect and engineer.

The Northeastern Iowa Power Co., Clermont, Iowa, has completed plans for a new hydroelectric power plant on the Wapsipinicon River, near Independence, Iowa. The Fargo Engineering Co., Jackson, Mich., is engineer.

The Andrews Wire & Iron Works, Inc., Preston Street, Rockford, Ill., is planning for the installation of new wire manufacturing equipment for the production of ornamental wire goods.

The United States Reclamation Service, Denver, Col., will take bids until Sept. 8, for cast iron gates, radio gates, hoists and hand rail, in connection with the Klamath, Orland and North Platte projects. The bids will be handled under specification 286-D.

The Common Council, Kewanee, Ill., has arranged for a bond issue of $125,000, for the construction of a municipal electric light and power plant. Plans will be prepared under the direction of J. Valmer, city engineer.

A vocational department will be installed in the new two-story and basement high school, 70 x 165 ft., to be erected at Maquoketa, Iowa, estimated to cost $150,000, for which foundations are under way. A power house will also be built. Arthur Ebeling, Kahl Building, Davenport, Iowa, is architect.

A vocational department will be installed in the new four-story high school at Ottumwa, Iowa, estimated to cost $700,000, for which date for receiving bids on general contract has been extended to Sept. 11. Croft & Boerner, 106 Marquette Avenue, Minneapolis, Minn., are architects.

The Chicago, Burlington & Quincy Railroad Co., 547 West Jackson Boulevard, Chicago, has completed plans for a new two-story electric power plant at McCook, Neb., estimated to cost $85,000. A new power house will also be built at Plattsmouth, Neb., to cost $110,000, and a similar plant at Alliance, Neb., one-story, 48 x 65 ft. A one-story addition will also be erected to the present power house at Lincoln, Neb.

The General Superintendent of Air Service, Post Office Department, Washington, will take bids early in September for a new aircraft plant at Maywood, Ill., including hangars, repair shops, service and warehouse building, estimated to cost about $90,000.

A. W. Lucal, care of H. D. Moreland, 3701 Sheffield Street, Chicago, architect, will build a one-story automobile service and repair works, 100 x 125 ft., at 916 Madison Street, Oak Park, Ill., to cost in excess of $70,000.

Buffalo

BUFFALO, Aug. 28.

PLANS are under way by the Skelton Shovel Co., care of Chamber of Commerce, Dunkirk, N. Y., for the erection of new works, estimated to cost close to $100,000.

The Common Council, Angelica, N. Y., has approved a bond issue for the construction of a municipal electric light and power plant.

The Niagara, Lockport & Ontario Power Co., Lockport, N. Y., is planning the erection of a new power plant in the vicinity of Jamestown, N. Y., and extensions in its system, estimated to cost in excess of $750,000.

A vocational department will be installed in the new three-story high school to be erected at Cortlandt, N. Y., estimated to cost about $400,000 for which bids will be taken at once. George W. Conable, 46 West Twenty-fourth Street, New York, is architect.

The Auto Sales & Service Corporation, 228 Williams Street, Rochester, N. Y., is planning the erection of a new service and repair building to cost about $150,000, including machine tools and other equipment.

A vocational department will be installed in the new two-story and basement high school to be erected at Fulton, N. Y., estimated to cost about $400,000, for which foundations will be placed under way at once. Wilson Potter, 22 East Seventeenth Street, New York, is architect.

The power house and other machinery at the plant of the Sikes Chair Co., 500 Clinton Street, Buffalo, were destroyed by fire Aug. 20, with loss estimated at $20,000. The department will be rebuilt. Albert D. Sikes is president.

The Bolivar-Richburg Electric Co., Bolivar, N. Y., is planning for extensions in its plant and system to cost about $30,000.

The Powertown Tire Corporation, Ridgeway Avenue, Rochester, N. Y., is planning the erection of a new one-story building, 40 x 125 ft., on East Avenue, to cost about $45,000.

The Northeast Electric Co., 348 Whitney Street, Rochester, will erect a steel and concrete addition, 51 x 90 ft. and 25 ft. high, to cost about $30,000.

The recent fire at the plant of Jewett & Co., Buffalo, did not damage the foundry or the power plant in any way. The heating plant can easily be put in order. The warehouse was but slightly damaged and has already been repaired. Only the assembly building was a total loss and will necessitate suspension of production until the completion of a new building, which was tarted on Aug. 16, six days after the fire. The contractor, the Turner Construction Co., has promised to complete the construction on Sept. 30 and the company expects to resume production on Oct. 15. The company has a large quantity of stoves which were not in any way damaged.

Philadelphia

PHILADELPHIA, Aug. 28.

THE Bloch Go-Cart Co., 1136 North American Street, Philadelphia, is taking bids for a new plant at 1143-47 North Third Street. Frank E. Hahn, 1112 Chestnut Street, is architect.

The Scott Paper Co., Weightman Building, Philadelphia, is planning for the completion of a new plant unit at its factory, foot of Market Street, Chester, Pa., and is arranging for the machinery installation at an early date. It will cost in excess of $300,000, including equipment. Other extensions and improvements will bring the total investment to close to $500,000.

A one-story power plant will be erected by the Fisher High Grade Dairies, Inc., 1935 East Willard Street, Philadelphia, in connection with its new plant on Worth Street, estimated to cost in excess of $70,000. William H. Timm, Perry Building, is architect. Frederick Fisher is head.

The William Kyle Co., 520 Arch Street, Philadelphia, manufacturer of lighting equipment, lamps, etc., has leased the entire building at 2107-9 Vine Street, for new works.

The Fennessey & Kobler Co., Twenty-sixth and Parrish Streets, Philadelphia, manufacturer of automobile bodies, is planning for the installation of new metal-working machinery and other equipment.

A one-story power house will be constructed by the St. Joan of Arc School, Frankford Avenue and Venango Street, Philadelphia, for which plans have been prepared by Eugene S. Powers & Son, 315 South Fifteenth Street, consulting engineers.

A one-story power house to cost about $25,000, will be constructed by Walter E. Knipe & Sons, Hancock Street, Philadelphia, at their new textile dye works at Wyoming and G Streets. W. E. S. Dyer, Land Title Building, is engineer.

The Pennsylvania Railroad Co., Broad Street Station, Philadelphia, will build a new shop at its plant at Enola, Pa., for the repair of steel car wheels. The company is said to have plans under consideration for the construction of five or more new engine houses, with repair shops, on sites to be selected in the State. Plans have been completed for the construction of a new grain elevator in the Girard Point section, to supplement the present plant. Contract has been let to the Sun Shipbuilding Co., Chester, Pa., for three new steel barges, to be used in connection with the new elevator.

The Wills-Sainte Claire Co. of Pennsylvania, 2033 Market Street, Philadelphia, has awarded contract to the John N. Gill Construction Co., Otis Building, for erection of a new service and repair building on Thirty-second Street, to be operated as a factory branch. W. J. Foss is president.

H. A. Jacobs, 1001 Market Street, Philadelphia, manufacturer of paper products, has purchased the five-story factory, 23 x 121 ft., at 923 Locust Street, for a new plant.

The De Frain Sand Co., Beach and Berk Streets, Philadelphia, is planning for the installation of a number of machine tools.

Fire, Aug. 24, destroyed a portion of the plant of M. L. Shoemaker & Co., Inc., Venango Street and the Delaware River, Philadelphia, manufacturer of fertilizer products, with loss estimated at close to $200,000, including machinery. It is planned to rebuild.

L. J. Faulkner, 14 North Paxton Street, Philadelphia, has taken bids for a new two-story automobile service and repair works at 1745-51 North Broad Street, estimated to cost about $100,000. J. J. Carroll, Middle City Bank Building, is architect.

Motors, controllers, conveying and other equipment will be installed in the new eight-story printing and publishing plant, 75 x 115 ft., to be erected by the Lutheran Publishing Co., Ninth and Sansom Streets, Philadelphia, estimated to cost about $500,000.

The Water Bureau, Room 216 City Hall, Philadelphia, Frank H. Caven, director, will receive bids until Sept. 7, for mechanical and electrical equipment for the new Southwest sewerage pumping station.

The Ford Motor Co., Highland Park, Mich., is reported to be negotiating for the purchase of the plant of the Taubel-Scott-Kitzmiller Co., Chestnut and Elm Streets, Trenton, N. J. It will be used as an automobile assembling plant.

Andrew J. Palasky, Trenton, N. J., has acquired property in the De Cou section, Broad Street Park, and will commence the erection of a new one-story machine shop and cabinet works.

The Free Bridge Motors Co., Morrisville, Pa., is planning for the construction of a two-story machine shop and automobile service works on Bridge Street, 86 x 90 ft. O'Rourke & Haig, 87 Liberty Street, Trenton, N. J., architects.

The Blair Ice & Cold Storage Co., 3124 Fifth Avenue, Altoona, Pa., has plans nearing completion for a new three-story ice and cold storage plant, 60 x 100 ft. F. H. Seitz, address noted, is head.

Oven and power equipment, conveying machinery, etc., will be installed in the new plant to be constructed by the Power City Baking Co., Hazleton, Pa., on property recently acquired. Plans are being drawn.

The Eastern Pennsylvania Power Co., Easton, Pa., will build a new one-story power house at Phillipsburg, N. J.

A. K. Wetzel & Sons, Shamokin, Pa., have awarded contract to the Shamokin Lumber & Construction Co. for a new two-story automobile service and repair works, 80 x 100 ft. A list of equipment is being arranged. William H. Lee, 32 South Seventeenth Street, Philadelphia, is architect.

The Bell Safety Bumper Co., Inc., 68 Thirty-fourth Street, Brooklyn, N. Y., manufacturer of automobile bumpers, etc., has tentative plans for a new factory at Bethlehem, Pa., and the removal of its present works to this location. The initial plant will give employment to about 250. The company has recently been acquired by new interests, headed by Aaron Potruch, Bethlehem, who is president.

The Confederated Home Abattoir Co., Odd Fellows Building, Bethlehem, Pa., will construct a cold storage plant in connection with its new packing plant at Allentown, Pa., estimated to cost in excess of $300,000. The Gorman-Brown Engineering Corporation, 40 Rector Street, New York, is engineer.

A vocational department will be installed in the new high school to be erected in Conyngham Township, near Aristes, Pa., estimated to cost close to $100,000. The Board of Education is in charge.

The Veterans' Bureau, Williamsport, Pa., is planning for the establishment of an automobile and machine repair shop and electrical repair works in the two-story building on Pine Street, recently acquired. It will be used as a trade school. Charles Billman is in charge.

The York Haven Water & Power Co., York Haven, Pa., is planning for the installation of a number of new generating units at its local power plant, to double approximately the present capacity, estimated to cost about $1,000,000.

F. H. Wagan, Philadelphia Street and Court Alley, York, Pa., has plans under way for a three-story automobile service and repair works, 100 x 100 ft., to cost about $75,000. J. A. Dempwolf, Casset Building, is architect.

The Anthracite Supply Co., 75 South Penn Avenue, Wilkes-Barre, Pa., is taking bids for a new four-story building, 35 x 150 ft., to cost about $45,000. Henry A. Maier, Coal Exchange Building, is architect.

Detroit

DETROIT, August 28.

THE L. A. Young Industries, Inc., Detroit, manufacturer of steel springs has acquired the plant of the Denby Motor Truck Co., adjoining its works at Holbrook Street and the Grand Trunk Railroad. The building comprises about 100,000 sq ft. of floor area, located on a 5-acre tract, and will be used entirely by the new owner for spring production. The company also has work under way on a five-story addition to its main plant, to provide about 125,000 sq. ft. of space.

The Common Council, North Branch, Mich., is planning for the installation of new pumping machinery, water tank and tower, and other equipment at the waterworks. C. B. Farnsworth is clerk.

The Filer Fibre Co., Filer City, Mich., manufacturer of pulp and paper products, has awarded contract to J. Olsen, Muskegon, Mich., for a two and three-story addition, 70 x 420 ft., with extensions, 60 x 60 ft., and 30 x 50 ft., estimated to cost about $125,000, exclusive of equipment. The company recently disposed of a bond issue of $500,000 for this and other expansion.

The Barley Motor Car Co., Kalamazoo, Mich., manufacturer of the Roamer automobile, is planning for expansion for the production of a new automobile to sell at a medium price. The manufacture of the Roamer car will be continued.

The Studebaker Corporation, Piquette Avenue, Detroit, has awarded contract to H. G. Christman, Stevens Building, for a five-story addition, 60 x 443 ft., to be known as plant No. 3.

The Rich Steel Products Co., Springfield Place, Battle Creek, Mich., has preliminary plans for a new three and four-story plant, estimated to cost about $500,000, including machinery. It is expected to complete plans and proceed with the project after the first of the year.

The Common Council, Omer, Mich., has authorized the purchase of property on the Rifle River as a site for a municipal electric light and power plant. Plans will be prepared at an early date.

The Consumers Power Co., Grand Rapids, Mich., will make extensions and improvements to its power plant and system to cost about $900,000.

The American Malleables Co., Owosso, Mich., suffered a serious fire loss on Aug. 18, but operations are again normal.

The allied Ford and Lincoln interests have the following plant units contemplated or under construction: Factory building to be erected at River Rouge, the general contract having been let to the Everett Winters Co.; alterations to the heat treating building and shipping plant of the Lincoln Motor Co. on West Warren Avenue, and a new building 1600 ft. long for general manufacturing. The Walbridge-Aldinger Co., is the general contractor on both the Lincoln additions.

Bids are being taken by Mildner-Eisen architects, on a one-story reinforced concrete factory, 37 x 195 ft., at West Fort Street and Swain Avenue for the Liberty Starter Co.

Awards on the new filtration plant, Bay City, Mich., will be decided early in September. Frazier, Ellms & Sheal, Cleveland, are the engineers.

A two-story reinforced concrete factory, 200 x 400 ft., will be erected by the Fisher Ohio Body Co., Flint, Mich.

Baltimore

BALTIMORE, Aug. 28.

A NEW coal tipple to cost about $300,000 including machinery will be erected by the Richmond, Fredericksburg & Potomac Railroad Co., Richmond, Va.

The Purchasing Agent, Post Office Department, Washington, will receive bids until Sept. 8, for 1000 automobile jacks; until Sept. 6, for 4000 adjustable pliers; until Sept. 8 for 400 sets of branding iron, 110 burglar-proof locking devices for Government safes, and for 20,000 ft. of single electric cable, low tension, and 5000 ft., high tension electric cable.

The Southern Yarn Conditioning Co., Winston-Salem, N. C., recently organized with a capital of $200,000, is planning the establishment of a plant to manufacture textile machinery. A. A. Johnson and Spencer B. Hanes, both of Winston-Salem, head the company.

The Board of Harbor Commissioners, room 351 Municipal Building, Wilmington, Del., will take bids until Sept. 8 for the following equipment: One railroad track scale, 200 lb. capacity; one steam locomotive crane, 20 tons capacity, 50 ft. boom; one steam locomotive crane, 20 tons capacity, 60 ft. boom; one steam locomotive crane, 20 tons capacity, 70 ft. boom; one and two light duty, traveling, electric portal cranes, 2½ tons capacity; four portable electric dock winches, 2 tons capacity; one mechanical cargo ramp; six electric tractor trucks, with two spare battery equipments; three load carrying trucks; fifty trailers for electric tractors; fifty stevedore hand trucks. The contractor will be required to complete his contract between Jan. 1, and Feb. 1, 1923.

The West Maryland Power Co., Garrett National Bank Building, Oakland, Md., has been organized with a capital of $250,000, by officials of the West Penn Electric Light & Power Co., Pittsburgh, as a subsidiary organization. It will take over the local municipal electric plant and system and operate as private property. Extensions and improvements will be made. Plans are also in progress for other expansion in this section.

The Office of the Public Printer, Government Printing Office, Washington, will take bids until Sept. 7 for synchronous converters, 6600-volt, 4500-kw. capacity, together with all switchboards, instruments, cable, etc.

The Chesapeake & Ohio Railroad Co., Norfolk, Va., is planning for extensions and improvements in its freight terminal to cost about $4,000,000, including coaling pier construction and the installation of additional coal-handling machinery. It will also extend its terminal facilities at Hampton Roads, Va.

The B. Mifflin Hood Brick Co., Atlanta, Ga., has acquired the plant of the Rome Fireproofing Co., Rome, Ga., with adjoining property. It will continue the operation of the works and plans for extensions and improvements to cost about $75,000, including the installation of additional equipment.

The Apex Coal Co., Lynchburg, Va., is perfecting plans for a new coal tipple in the vicinity of Sargent, Ky.

The Elkin Veneer & Mfg. Co., Elkin, N. C., is preparing plans for the rebuilding of the portion of its plant recently destroyed by fire. Equipment to be installed included Corliss engine and auxiliary power apparatus.

The Potomac Public Service Co., Hagerstown, Md., recently acquired by the American Water Works & Electric Co., 50 Broad Street, New York, is planning for the installation of additional machinery at Millville, W. Va., on the Shenandoah River.

The Baltimore Paper Box Co., Howard and West Streets, Baltimore, has acquired the property of the Key Mfg. Co., Key Highway, Stockholm and Covington Streets, totaling about 100,000 sq. ft. of floor area, on a two-acre site. The company will use the building for expansion, and plans for the installation of new machinery to cost about $75,000.

The Stahl Toy & Novelty Co., New Bern, N. C., is planning for the installation of an automatic lathe and other mechanical equipment in a building acquired for a local plant. It will specialize in the manufacture of mechanical toys. K. E. Stahl is head.

A vocational department will be installed in the high school to be erected at Concord, N. C., estimated to cost about $150,000, for which bids will be asked about Sept. 15. C. Gadsden Sayre, Anderson, S. C., is architect.

The Georgia Railway & Power Co., Atlanta, Ga., is arranging for a preferred stock issue of $2,500,000, a portion of the proceeds to be used for extensions and improvements.

Electric pumping machinery and other power equipment will be installed in connection with the extensions to the water filtration plant at Montebello, Baltimore, estimated to cost about $1,500,000, with equipment. Plans will be prepared under the direction of Chief Engineer Megraw, Water Bureau, Baltimore.

A vocational department will be installed in the high school to be erected at Bamberg, S. C., for which plans will be prepared at an early date. The District Board of School Trustees is in charge.

The Parry-Mann Electric Co., Columbia, S. C., is planning for the purchase of an engine-generator set, with 300 hp. engine and 225 kw. generator, with exciter, switchboard and auxiliary equipment. W. M. Parry is president.

Indiana

INDIANAPOLIS, Aug. 28.

A NEW municipal electric power plant will be erected by the Board of Sanitary Commissioners, Indianapolis, in connection with a sewage disposal plant, estimated to cost about $115,000.

The White-Wood Products Co., Crothersville, Ind., manufacturer of handles and other turned wood products, is planning to rebuild the portion of its plant destroyed by fire Aug. 16, with loss estimated at $50,000, including machinery. Harlan White is general manager.

The Board of Blackford County Commissioners, Hartford City, Ind., will take bids until Sept. 4 for two cast iron sectional, down draft boilers, header type, 1500 sq. ft. of surface. W. C. Hughes is county auditor in charge.

The Bertsch Co., Cambridge City, Ind., manufacturer of heavy type machine tools, will soon take bids for a one-story addition, 30 x 100 ft. C. E. Werking & Son, Palladium Building, Richmond, Ind., are architects.

The Inland Body Co., Indianapolis, is perfecting plans for the removal of its plant to Columbus, Ind., where it will occupy a portion of the building of the Emerson-Brantingham Co. Charles S. Murphy is in charge.

The Universal Burner Co., Logansport, Ind., recently incorporated, with $25,000 capital stock, is seeking a site for a plant to manufacture crude oil burners, storage tanks, etc. Allen E. Nelson, Logansport, is head of the concern.

The Interstate Car Co., Massachusetts Avenue and Sherman Street, Indianapolis, manufacturer of automobiles, has filed plans for a one-story addition.

The Conduitt Automobile Co., Indianapolis, local representatives for the Peerless, Maxwell and Chalmers automobiles, has completed plans for a new three-story building, 63 x 200 ft., at Meridian and St. Joseph Streets, estimated to cost about $150,000. The third floor will be used entirely as a machine and repair shop. A portion of the second floor will also be equipped for similar service for the used car department. John A. Boyd is general manager.

The Louisville Cement Co., Louisville, has arranged an appropriation of about $500,000 for a new cement mill at Speed, Ind., to replace the portion of the works recently destroyed by fire with loss of about $300,000. The new mill will be equipped for a capacity of 2500 bbl. per day, as compared with 1800 bbl. at the former plant. All machinery will be electrically operated.

New England

BOSTON, Aug. 28.

THE improvement in going business, manifested a week ago in the machine-tool market, apparently is dissipated. The total bookings in this district of new and used tools the past week dropped to infinitesimal figures, practically the only sale to which much importance is attached being a new vertical milling machine to a Rhode Island firm against a list of seven or eight tools. The lack of new business generally is ascribed to vacations.

The machine-tool trade is looking forward to increased business next month, when at least some of the prospects give promise of closing. The position of New England builders apparently is slowly improving and new active spots are appearing. A Hudson, Mass., maker of broaching machines is operating overtime and supplying meals to employees working evenings. The company has a substantial order from automobile makers, which includes machines as well as broaches. A northern New England gear shaper manufacturer is busy, while a Connecticut maker of lathes is on full time and a Worcester maker of grinding machinery is very busy on machines for the automobile trade. Producers of grinding wheels are increasingly busy, the demand for quick deliveries being a feature. Prices for abrasive wheels are very firm with the tendency, if anything, upward. The New England abrasive industry is slightly better than 50 per cent of normal, including export business, which is coming back slowly, contrasted with 20 per cent of normal, the low point during the business depression.

Sale by auction of the machine tools at the plant of the Morris Metal Products Co., Union Avenue, Bridgeport, Conn., Aug. 31, at 10:30 a.m., includes about 300 tools, of which there are a large number of lathes as well as milling machines, drills, etc. The auction is in charge of J. E. Conant & Co., Lowell, Mass.

Bids will be taken this week by the Boston Elevated Railway Co., Boston, for the first two units of the proposed consolidated machine shop, at Everett, Mass.

The United Electric Railway Co., Providence, R. I., is about to accept figures on a one and two-story garage and service station, 78 x 250 ft.

Contract has been awarded by the Wickwire-Spencer Steel Corporation, Worcester, to replace the structure recently destroyed by fire. The new unit will be three-stories 33 x 100 ft. and will be devoted to wire drawing.

The Atlas Body Works, Inc., McKinley Avenue, Bridgeport, Conn., will build a one-story addition, 45 x 90 ft. The present factory will be remodeled and improved, and a new power house, 15 x 30 ft., constructed. Harry E. Koerner, Bridgeport, is architect.

The Norton Co., Worcester, Mass., will commence the immediate erection of a new four-story building, 50 x 125 ft., on site near plant No. 6.

Fire, Aug. 19, destroyed a portion of the plant of the Haverhill Box Board Co., Haverhill, Mass., with loss reported at close to $90,000, including equipment and stock.

Chaplin & Chaplin, 376 Main Street, Springfield, Mass., will erect a new automobile service and repair building, 50 x 100 ft., at Mill and Orange Streets.

A vocational department will be installed in the new four-story high school, 75 x 100 ft., to be erected at Revere, Mass., estimated to cost about $250,000, for which work will

be placed under way at once. The local Board of Education is in charge.

J. John Kruse, 721 North Main Street, Waterbury, Conn., has inquiries out for metal card holders, about 3 x 7 in., and desires to contract with a metal-working plant to manufacture specialties of this kind.

The Carlson Brothers Tool & Machine Co., Boston, has leased the building at 15 B Street, South Boston, for a machine shop.

The Water Department, Fall River, Mass., is taking bids until Sept. 6 for a new machine and repair shop in connection with a two-story administration building to cost about $40,000. N. C. Chase, 11 Pleasant Street, is architect. John F. Moran is superintendent of the department.

Fire, Aug. 19, destroyed a portion of the plant of the Cambridge Automobile & Wagon Co., 141-49 First Street, Cambridge, Mass., with loss estimated at $50,000. It will be rebuilt.

The Colonial Automobile Co., 1279 Main Street, Hartford, Conn., has awarded contract to the Austin Co., 217 Broadway, New York, for a one and two-story automobile service and repair building on the Connecticut Boulevard, estimated to cost close to $50,000.

A merger is being arranged between the M. S. Little Mfg. Co., 151 New Park Avenue, Hartford, Conn., and the A. J. Beaton Mfg. Co., New Britain, Conn., both manufacturers of heating equipment and supplies, under the name of the first noted company. The new organization will be capitalized at $500,000. Plans are being considered for enlargements in the Hartford plant to accommodate the machinery and equipment of the Beaton company.

Milwaukee

MILWAUKEE, Aug. 28.

PROGRESS in operations and production continues to be made by manufacturers of machine tools despite the railroad shop strike which has had a serious effect on buying by the railroads. The resumption of coal shipments to local industries has made their situation more substantial and hopeful, but a free swing is not expected until transportation matters are settled. Reports from jobbers and dealers in tools show a slightly better average of business in August than in July, due largely to the fact that last month witnessed a seasonal letting down of production in the iron, steel and machinery industries, including the automotive trade. The last-named industry has furnished most of the gain this month, and pending inquiry forecasts even better activity in September and October.

The Common Council, Madison, Wis., expects to select a site before Sept. 15 for the proposed new municipal sewage disposal plant estimated to cost from $741,000 to $821,000. It is hoped to start construction before the end of the year. E. E. Parker is city engineer.

The Phoenix Cheese Co., Plymouth, Wis., has plans for a five-story reinforced concrete cold storage warehouse, 40 x 65 ft., the equipment of which includes a 300-hp. steam generating plant and a 20-ton artificial ice making unit. Bids will be taken after Sept. 1. R. A. Page is general manager.

The Sheboygan Foundry Co., Eighteenth Street and Union Avenue, Sheboygan, Wis., will build a two-story addition, 40 x 80 ft., to be used as a pattern shop, pattern vault, grinding room, etc. Fred Ristow is general manager.

The Automatic Seating Co., Superior, Wis., is completing the remodeling of the plant of the former American Bedding Co., at Butler Avenue and North Twenty-sixth Street, and expects to commence initial operations in September. It is a $200,000 Wisconsin corporation which will build an all-metal frame chair. Perry J. Elkstrand is president; George Carlson, vice-president, and John Greiff, secretary and treasurer.

The Allis-Chalmers Mfg. Co., Milwaukee, has taken an order valued at approximately $100,000 for pumps and other equipment for the Regala & Marianas Water Works Co. of Regala, Cuba. The order was placed in person by Senor M. Ortiz, general manager.

The Spring City Auto Co., Waukesha, Wis., has plans by Monroe Heath Blake, local architect, for a garage, machine shop and sales building, 65 x 200 ft., one story and basement, estimated to cost $35,000 with equipment.

The Thompson Brothers Boat Co., Peshtigo, Wis., manufacturing metal and wooden hull power and rowboats, will build a three-story brick and mill factory addition, 60 x 100 ft., for sheet metal and wood working operations, assembling and storage. The investment in building and machinery will be about $60,000.

The Dells Paper & Pulp Co., Eau Claire, Wis., has awarded the general contract to the C. R. Meyer & Sons Co., Oshkosh, Wis., for a new hydroelectric generating plant to develop 1000-hp. It will cost about $165,000.

The Green Bay, Wis., Board of Vocational Education has ordered competitive plans for the new $180,000 central continuation school at Pine and Jefferson Streets. A selection is to be made by Oct. 15 so that initial construction work may be undertaken before the close of the year. The equipment of the present school in leased quarters at 102 North Adams Street will be transferred to the new institute but much additional miscellaneous equipment will be purchased early in 1923. H. G. Stewart is director.

The Philip Meyer Mfg. Co., Racine, Wis., has been incorporated with a capital stock of $25,000 to take over and develop the business of Philip and John Meyer, manufacturers of food choppers and other metal household utensils. A larger plant is being sought.

The Walsh Harness Co., 137 Keefe Avenue, Milwaukee, will build a two-story factory addition, 50 x 75 ft., costing about $20,000 with equipment.

The Bergman Coal Co., Eau Claire, Wis., will establish a branch plant in Chippewa Falls, Wis., with an investment of about $25,000. A storage building with a capacity of 1500 tons, including hoppers, screening plant, etc., for gravity loading, will be erected. A Godfrey conveyor system for unloading cars has been purchased. W. C. Bergman is manager of the new branch.

M. D. Robrecht, Antigo, Wis., will build a three-story cold storage warehouse, 40 x 100 ft., on Morse Street, which will require a 150 to 200-hp. power plant and an artificial ice and refrigerating unit. Definite specifications will be issued shortly.

The Madison Tool & Stamping Works, 1917 Helena Street, Madison, Wis., will erect a new boiler room and coal storage building to cost about $10,000.

The Green Bay Dry Dock Co., Green Bay, Wis., expects to ask figures shortly on the construction of a new floating dry dock estimated to cost $600,000. It will be of reinforced concrete and consist of twelve 50-ft. sections, making the dimensions 60 x 600 ft. E. J. Morrison, 53 West Jackson Boulevard, Chicago, is engineer in charge of mechanical and structural engineering. Carl Hartman is president of the drydock company.

The Anko Mfg. Co., Wausau, Wis., is increasing its capitalization to provide more adequate facilities for the production of a device for permanent installation in smokestacks and chimneys for soot absorption and fire prevention. The company was incorporated for $50,000 a year ago and built a new machine shop, 50 x 150 ft., on a two-acre site. No immediate new construction is planned, but the equipment will be enlarged. T. G. Kohl is president.

The Dallman Machine Co., 935 Winnebago Street, Milwaukee, has purchased the rights to the manufacture of sliding gears and clutches developed by the Smith Sliding Gear & Clutch Co., North Lake, Wis. The Smith company will continue to manufacture pulleys and transmission devices, principally for tractors, traction engines and threshing outfits.

The Federal Rubber Co., Cudahy, suburb of Milwaukee, has ordered resumption of construction work on a seven-story manufacturing addition, 120 x 250 ft., of which the basement and first floor were completed about eighteen months ago. Three additional floors will be erected at this time. The general contractor is the Thomas Sideritis Co., 1591 Second Street, Milwaukee. Arthur A. Frank is general manager of the Federal company.

Ernest Heinemann of Seymour, Wis., has leased the former Paige garage building at Antigo, Wis., and will establish a machine, welding and cutting shop.

The Corona Pen Co., Janesville, Wis., has been organized with $25,000 capital stock by S. V. Corona, J. L. Pitt and E. H. Damrow to manufacture fountain pens, metal pencils and similar goods. A plant is being established at 22 West Academy Street.

The Ingersoll-Rand Co., Minneapolis branch, will furnish and install two Cameron deep well pumps in the new municipal waterworks improvement at Stevens Point, Wis., at $4,065 each.

William C. Schultz, Watertown, Wis., has resigned as vice-president, treasurer and general manager of the Watertown, Wis., Table Slide Co., and is organizing a new corporation with $125,000 capital to manufacture hardwood specialties. A new factory will be erected, but the exact location has not been divulged, although it is likely that it will be in Fond du Lac, Wis.

Pittsburgh

PITTSBURGH, Aug. 28.

AUGUST has been a dull month for machine tool sales in this district, but since there were good reasons for such a condition, the trade is hopeful that September will show improvement. Inquiry has been good throughout the month and in the past week some of the trade have been called upon to quote prices on an unusually large number of prospective orders. Cases are reported by machine tool salesmen who have called upon customers to find that the man in charge of purchases has been away seeking coal.

An unnamed maker of lathes in the East is reported to have advised local dealers of an adjustment in prices, which means an increase of about 10 per cent. Makers of shapers are reported to be adhering more rigidly to quoted discounts.

While current business in cranes and other heavy equipment is quiet, prospective business is good. The Jones & Laughlin Steel Co. is in the market for a ladle crane and an open hearth furnace charging machine. The Carnegie Steel Co. is asking bids on a gantry crane. The Weirton Steel Co., Weirton, W. Va., will want considerable equipment in connection with a new sheet mill it proposes to construct. Action on cranes and other equipment for the new Gary, Ind., plant of the National Tube Co., is not looked for now until next month. The Shepard Electric Crane & Hoist Co., recently took orders for three 2-ton and one ½-ton hoists for the Morrow Mfg. Co., Wellston, Ohio; two 2-ton and two 5-ton hoists for the American Bridge Co., Pittsburgh; one 2½-ton hoist for the Pittsburgh & Lake Erie Railroad, Pittsburgh; and a 1-ton and ½-ton hoist for the Edwin M. Hill Lumber Co., Pittsburgh.

The Stroh Steel-Hardening Process Co., Westinghouse Building, Pittsburgh, has plans under way for an addition to its foundry at Ridge Avenue and Chateau Street and the remodeling of the present building, estimated to cost in excess of $200,000 with equipment. W. Y. Stroh is president.

The American Window Glass Co., Farmers' Bank Building, Pittsburgh, is planning the erection of an addition to its plant at Jeannette, Pa., to comprise a 12-machine building, with blowing machinery, tanks, glass conveyors and other equipment, estimated to cost $1,500,000. W. L. Monro is president.

Walling & Co., 518 Washington Street, Johnstown, Pa., is completing plans for a three-story automobile service and repair works estimated to cost $150,000. S. E. Dickey & Co., Johnstown, are architects.

The Englert Mfg. Co., 2131 Carson Street, Pittsburgh, operating an automobile battery manufacturing and repair works, has acquired property, 68 x 120 ft., at South Twenty-fifth and Jane Streets, for a new plant. Harry N. Englert heads the company.

The Keystone Hair Insulator Co., 1243 Spring Garden Avenue, Pittsburgh, has filed plans for an addition to cost about $39,000.

The Kund & Eiben Mfg. Co., 204 Warrington Avenue, Pittsburgh, manufacturer of cabinets, etc., has plans nearing completion for a new one-story factory, 60 x 170 ft., at Bedford, Pa.

The Equitable Gas Co., 435 Sixth Avenue, Pittsburgh, a subsidiary of the Philadelphia Co., is taking bids for new mechanical and repair shops on Reedsdale Street, Northside. A warehouse will also be built.

The Westinghouse Electric & Mfg. Co., Union Building, Pittsburgh, has filed plans for a new building at Lang Avenue and Susquehanna Street, to cost about $150,000.

The Monongahela Incline Plane Co., West Carson Street, Pittsburgh, will build a one-story power house at 106 Grandview Avenue.

The Standard Seamless Tube Co., 313 Sixth Avenue, Pittsburgh, is planning for a one-story addition at Ambridge, Pa., 80 x 475 ft.

The Du Roth Steel Truck & Car Wheel Co., 611 Keystone Building, Pittsburgh, has awarded contract to the Pittsburgh Bridge & Iron Works, Bessemer Building, for the initial building at its new plant at Osgood, Pa., one-story, 100 x 200 ft. C. Edward Long, 1202 People's Bank Building, is engineer.

The E. E. White Coal Co., Glen White, W. Va., has arranged an appropriation of about $200,000 for additional electrical and mechanical equipment. E. E. White is president.

The American Coal Co., Piedmont, W. Va., has tentative plans for rebuilding its tipple destroyed by fire Aug. 16, with loss estimated at $60,000, including equipment.

The Diamond Ice & Coal Co., Charleston, W. Va., is planning for enlargements in its ice and refrigerating plant, including the installation of a 160-ton refrigerating machine and auxiliary equipment.

The Board of Education, 2105 Chapline Street, Wheeling, W. Va., is said to be arranging a list of equipment for installation at its vocational schools.

The Hughes Coal Co., Shinnston, W. Va., is planning to rebuild its tipple, including the installation of new machinery. W. C. Hawkins, Fairmont, W. Va., is engineer.

S. J. Hyman, Huntington, W. Va., is organizing a company to build and operate a plant to manufacture coal by-products, estimated to cost in excess of $80,000, including machinery. A site has been acquired.

Power equipment, a traveling oven, conveying machinery and other mechanical apparatus will be installed in the addition, 100 x 250 ft., to be erected by the Stroehmann Baking Co., Huntington, W. Va., estimated to cost about $100,000.

Cincinnati

CINCINNATI, Aug. 28.

THE month of August in the machine-tool industry will come well up to the aggregate of June and July. In the early part a noticeable falling off in orders was seen, but along toward the middle of the month buying was resumed at a fair rate, with the result that August will show a satisfactory volume of business. Manufacturers of milling machines and boring mills experienced one of the best months since the quiet period set in in 1920, while some lathe manufacturers report good orders, closely approaching the aggregate of June, which was the best month recorded for a year and a half. With a resumption of railroad buying, noticed last week in connection with the Union Pacific and Illinois Central lists, the trade generally looks for a much better situation the remaining months of the year. A local manufacturer received an order for five machines from a North Carolina railroad last week. The Westinghouse Electric & Mfg. Co. was a purchaser in the local market, negotiations having been completed for a number of machines, including a large planer. The Chesapeake & Ohio Railroad is contemplating the purchase of a fairly large number of tools, but the list has not yet been issued. Small lathes for vocational schools are in fair demand, as are multiple spindle drills.

Manufacturers of turret machinery have announced increases in prices ranging from 5 to 15 per cent, and it is expected that other manufacturers will make advances shortly.

The Cropper-Kinney Auto Spring Co., Lebanon, Ohio, has been organized with a capitalization of $50,000 to manufacture automobile springs and will erect a plant in Lebanon. George W. Cropper is president and S. W. Kinney, vice-president.

The Clark Grave Vault Co., Columbus, Ohio, which recently disposed of its plant, has purchased the property of the Monitor Motor Car Co. at Fifth Avenue and the Big Four Railroad, and will occupy the premises immediately. Some new equipment will be installed.

The Columbus Showcase Co., Columbus, Ohio, has awarded contract to Frank Hill Smith, Inc., for a new plant, 82 x 382 ft., two stories, of reinforced concrete and brick.

Two large buildings of the American Car & Foundry Co., Jeffersonville, Ind., were damaged by a wind storm Aug. 24. The loss, including railroad equipment under repair, will amount to approximately $200,000.

The T. J. Callahan Co., Dayton, Ohio, manufacturer of ventilating equipment, heretofore operating as a partnership, has been incorporated with a capitalization of $200,000. No definite plans for extensions have been completed, but it is expected to install additional machinery from time to time to increase the output. T. J. Callahan is president.

The Alco Foundry & Machine Co., Hamden, Ohio, has been incorporated with a capitalization of $50,000. It has been operating as a partnership. While no definite plans have been completed, the company expects to add a machine shop to its works in the near future and is contemplating extensions to present buildings. M. C. Abele is president.

The Engineer Division, Air Service, McCook Field, Dayton, Ohio, will take bids until Sept. 5, for one rolling mill, with one pair of plain rolls, direct-connected to electric motor.

Cleveland

CLEVELAND, Aug. 28.

AUGUST has been a disappointing month with machine tool builders, due largely to restrictions in buying, resulting from the railroad and coal strikes, but the trade looks for considerable improvement next month. One local machine tool manufacturer reports August sales up to 75 per cent of July, but another has done only about 50 per cent as much business this month as in the previous month. Dealers' sales are holding up fairly well and new inquiries show a little improvement. Among inquiries is one from a new Cleveland company which has asked for quotations on several machines and is expected to purchase 30 or more tools.

During the week the Cleveland Board of Education purchased several machines against its recent list. Some railroad orders were closed on lists pending for some time. The New York Central purchased two large turret lathes, the Illinois Central two small turret lathes and the Union Pacific one turret lathe from a Cleveland manufacturer. A builder of automatic machinery booked four orders, each for a single machine. The Otis Steel Co. purchased a 36-in. lathe and has sent out an inquiry for a 96-in. shear. The Lima Locomotive Works, Lima, Ohio, has not yet purchased any of the equipment required for its new plant for which it has issued a tentative list.

The Warner & Swasey Co., Cleveland, following its recent price advances on turret lathes will issue new lists Sept. 1, making further slight advances on all of its machines in order to balance selling prices with production costs.

The Otis Steel Co. has sent out an inquiry for about 25 cranes of various sizes and types for its new steel plant and is figuring on mills, furnaces and other plant equipment. Some of this business will probably be placed shortly.

The Ohio Brass Co., Mansfield, Ohio, has purchased a 16-acre site at Niagara Falls, Ont., and will erect a large factory to take care of its Canadian trade.

The Firestone Tire & Rubber Co., Akron, Ohio, has about completed a new automobile rim plant which it expects to place in operation about Sept. 1. This is a one story building 880 ft. long and 250 ft. wide, brick and steel, and has a floor space of over five acres.

The Superior Steel Wool Co., Perrysburg, Ohio, has about completed a new plant, 100 x 400 ft., for the manufacture of steel wool.

The Cleveland Board of Education will receive bids Sept. 11 for a 30 in. single finishing plane for the West technical high school.

The Barberton Machine Shop & Foundry Co., Barberton, Ohio, recently organized, will shortly begin the erection of a new plant on Robinson Avenue.

The plant of the Shunk Mfg. Co., Bucyrus, Ohio, will be moved to the former Allen Motor Co.'s plant, Bucyrus, which was purchased some time ago by John O. Shunk. New equipment will be added for the manufacture of plow units for use with tractors.

The Trump Rubber Co., East Akron, Ohio, operating at the plant formerly occupied by the Denmead Rubber Co., is planning the erection of an addition for the manufacture of automobile tires.

The Gulf States

BIRMINGHAM, Aug. 28.

THE Thomas Grate Bar Co., Birmingham, is planning for the installation of a new 10-ton overhead electric traveling crane, with 29 ft. span and lift of 20 ft.

The McWane Cast Iron Pipe Co., Birmingham, will break ground early in September for the first unit of a new plant on property recently acquired at East Birmingham. It will specialize in small pipe from 1 to 6-in. in diameter. Employment will be given to about 150. J. R. McWane is president.

The American Can Co., 120 Broadway, New York, has awarded contract to the Turner Construction Co., 242 Madison Avenue, for a four-story addition to its plant at New Orleans, 200 x 200 ft., estimated to cost about $750,000, including machinery.

The Dallas Power & Light Co., Dallas, Tex., will erect an electric generating plant addition, estimated to cost $2,180,000, including machinery. Plans will be completed and work placed under way at an early date. A new 15,000-kw. turbo-generator, exciter, switchboard, boilers, pumps and auxiliary equipment will be installed.

The Baton Rouge Ice Co., Baton Rouge, La., is planning for an addition, including the rebuilding of the present structure. Machinery will be installed to double the capacity. G. E. Wells, St. Louis, is architect.

A vocational department will be installed in the new high school to be erected at Commerce, Tex., for which bonds for $120,000, have been voted.

The United States Engineer Office, Mobile, Ala., will receive bids until Sept. 18 for one hydraulic turbine, 1000 hp. capacity, with governor, as per specifications on file.

The White Eagle Oil & Refining Co., Kansas City, Mo., has tentative plans for a new oil terminal at Beaumont, Tex., estimated to cost about $250,000, including pumping and power equipment, tanks, etc.

The Common Council, Pelahatchie, Fla., has authorized the preparation of plans for a municipal electric light and power plant. Swanson-McGraw, Inc., New Orleans, are consulting engineers.

The Missouri, Kansas & Texas Railroad Co., St. Louis, has arranged an appropriation of about $5,000,000 for extensions and improvements in its shops, freight houses, yards and other properties in Texas. The shops at Denison will be made the largest on the system and about $3,500,000 will be expended at this point. The new locomotive shops to be built at Waco will cost close to $1,000,000, including machinery, and will be equipped for re-building locomotives. New freight depots will be constructed at Waco and Wichita Falls, each one and two-stories, 60 x 600 ft., estimated to cost about $200,000 each, including freight-handling machinery.

The Common Council, DeQuincy, La., is arranging a bond issue of $120,000, for a municipal electric light and power plant, and waterworks.

The Houston Power Co., Newton, Ala., will construct and operate a hydroelectric power plant at Waterford, Ala., with initial capacity of about 3000 hp. The Southern Engineering Corporation, Albany, Ga., is engineer.

The Simmons & Trawick Crate Co., Tallahassee, Fla., recently organized with a capital of $200,000, is planning for the installation of crate and box-making machinery, conveying apparatus, etc. J. M. Simmons is president.

The Pacific Coast

SAN FRANCISCO, Aug. 22.

THE Yuba Development Co., Hobart Building, San Francisco, is taking bids for equipment for installation at its new power plant near Marysville, Cal.: R. H. Elliott, general manager, is in charge.

The Long Beach Paper Co., Long Beach, Cal., has plans under way for a new plant on Cherry Avenue, including new equipment.

The Bureau of Yards and Docks, Navy Department, Washington, is taking bids until Sept. 13, for new shops to be erected at the naval base, San Diego, Cal.

Alexander Hursh, 12 Locust Avenue, Los Angeles, is having plans prepared for a new oil refinery at Cherry and Newport Avenues, Long Beach, Cal., to cost about $55,000.

Perry E. Fritz, 2941 Sunrise Street, Los Angeles, has filed plans for a new one-story machine shop.

The Northwestern Electric Co., Portland, Ore., has preliminary plans under way for a new hydroelectric generating plant estimated to cost in excess of $2,500,000 with machinery and transmission system.

The Baker Street Garage, Bakersfield, Cal., is planning for the rebuilding of its service and repair works, recently destroyed by fire. New equipment will be installed.

The Puritan Ice Co., Santa Barbara, Cal., has completed plans for a new ice-manufacturing plant at Guadalupe, Cal., estimated to cost close to $100,000, including machinery.

The Reedley School District, Reedley, Cal., has had plans prepared for a one-story vocational and manual training building. Floyd Caskey is clerk.

The Ames Shipbuilding & Drydock Co., Seattle, Wash., will make extensions and improvements in its plant on the West Waterway, estimated to cost about $30,000. It will include a mold loft.

The Washington Iron Works, Seattle, Wash., will commence work on the first unit of its new plant, to comprise a two-story steel building, 70 x 570 ft., estimated to cost $100,000. It will be equipped as a boiler and tank shop. Other units will be built later. The entire plant will cost about $500,000.

Fire, Aug. 17, destroyed the plant of the A. C. White Lumber Co., Laclede, Idaho, including buildings, machinery, power equipment, etc., with loss estimated in excess of $500,000. It is planned to rebuild.

The Booth-Kelly Lumber Co., Eugene, Ore., is completing plans for the construction of a new mill at Wendling, Ore., to replace the plant recently destroyed by fire. A. C.

Dixon, manager, is in charge. It will be electrically operated.

Brewer & Baldwin, Winlock, Wash., are considering rebuilding their shingle mill, recently destroyed by fire. Electrically-operated machinery will be installed.

The Central South

ST. LOUIS, Aug. 28.

PLANS are in progress for a new three-story factory for the Davis Boring Tool Co., 3722 Forest Park Boulevard, St. Louis, estimated to cost $160,000, including machinery.

The Edina Light Co., Edina, Mo., has acquired the electric plant and property of the Merchants' Power & Light Co., Novinger, Mo. The new owner plans for extensions and improvements.

Fire, Aug. 18, destroyed a portion of the plant of the Brooklyn Cooperage Co., Poplar Bluff, Mo., with loss estimated at about $100,000, including machinery. It is planned to rebuild. Headquarters of the company are at 142 Kent Avenue, Brooklyn, N. Y.

The City Ice Co., Twenty-first and Campbell Streets, Kansas City, Mo., is arranging for the construction of a new ice and cold storage plant with initial capacity of about 3000 tons.

The Air Terminal Association, 422 Reliance Building, Kansas City, Mo., recently organized, will install a repair shop in connection with its new hangars and air terminal buildings on local site. James B. Harvey is general manager.

Paul Sheridan, Fort Smith, Ark., has awarded contract to the J. H. Reddick Co., Fort Smith, for a two-story addition, 72 x 140 ft., to his automobile service and repair works, estimated to cost $35,000, exclusive of equipment.

The Thomas Fruit Co., Sixth and Kentucky Streets, Joplin, Mo., is arranging for extensions and improvements in its ice and refrigerating plant, estimated to cost about $35,000. Smith & Van Pelt, 819 Frisco Building, are architects. A. B. Thomas is president.

The Memphis Sash & Door Co., 673 South Dudley Street, Memphis, Tenn., is planning for the erection of a new three-story factory 200 x 300 ft., estimated to cost in excess of $80,000.

A vocational department will be installed in the new two-story high school to be erected at Dadesville, Mo., 60 x 100 ft., for which plans are nearing completion. Earl Hawkins & Co., McDaniel Building, Springfield, Mo., are architects.

The Indiana Board & Filler Co., Vincennes, Ind., recently organized a capital of $750,000, has acquired the plant and business of the Tennessee Fibre Co., North Memphis, Tenn., and will operate the plant for the manufacture of strawboard and fibre specialties. Plans are under way for enlargement and the installation of additional machinery.

The Dexter Helium Co. of America, Winfield, Kan., M. W. Baden, president, has preliminary plans in progress for a new helium plant at Dexter, Kan., estimated to cost about $1,000,000. It will include power house, mechanical shop, etc.

The White Trunk Co., 217 West Lewis Street, Wichita, Kan., is planning for the installation of machine tools, belting, shafting and other transmission equipment. J. F. Kemel is manager.

The Missouri Lumber Co., Hot Springs, Ark., is planning to rebuild the portion of its plant on Gaines Avenue, recently destroyed by fire with loss estimated at $80,000, including equipment.

A vocational department will be installed in the three-story and basement high school to be erected at Lockwood, Mo., for which foundations are now under way. Charles Sudhoelter & Co., 715 Joplin Street, Joplin, Mo., are architects.

The Log Mountain Coal Co., Middleboro, Ky., recently organized with a capital of $2,500,000 to form a merger of seven coal mining companies operating in Bell County, Ky., has plans under consideration for the installation of new electrical and mechanical equipment, including mine cars, etc. E. S. Helburn is president, and J. R. Ramey, treasurer, both of Middleboro. J. E. Justice, Williamsburg, Ky. is chief engineer.

The Continental Asphalt & Petroleum Co., Oklahoma City, Okla., will install new crushing, grinding and mixing machinery at its rock asphalt deposits at Sapulpa, Okla., for the establishment of a new plant. A power house will also be established.

A vocational department will be installed in the new two-story and basement high school to be erected at Wetumka, Okla., estimated to cost about $100,000, for which bids on a general contract are being received. Tonini & Bramblet, Terminal Building, Tulsa, Okla., are architects.

Canada

TORONTO, Aug. 28.

MACHINE-TOOL buying on a conservative scale was noted the past week. The opening of the Canadian National Exhibition at Toronto on Aug. 26, which will be continued until Sept. 9, gives dealers and manufacturers an opportunity to show their special lines of tools and general equipment in actual operation, and as a result a buying movement is expected to develop next month. Notwithstanding the limited amount of buying, manufacturers state they have considerable orders on their books and that the outlook for the future is bright. Plant operations have been steadily increasing and if a fuel famine does not strike the country this winter a continuation of present activities is looked for. Many industrial concerns have recently been organized for the purpose of locating manufacturing plants in Ontario and other provinces and numerous plants are under construction for which requirements have not yet been placed. Equipment for public works is still moving steadily and manufacturers of paper making machinery report active operations with a steady increase in productive capacity. Small tools are moving freely.

The Fedders Mfg. Co., Ltd., Bridgeburg, Ont., is in the market for a spot welder, similar to No. 312B Federal machine; 220 volts, 25 cycle, three phase.

The sawmill owned by Ritchie Brothers, Aylmer, Que., was destroyed by fire with a loss of $50,000. Rebuilding operations are expected to start at an early date.

Bids will be called shortly by the town of Chilliwack, B. C., for the construction of a sewage system. The work will include an additional pumping station equipped with 4-in. vertical centrifugal pumps, electrically driven with automatic float control.

John S. Martin, Reeve, Port Dover, Ont., will receive bids until Sept. 8 for waterworks plant and necessary equipment to cost $60,000. James, Proctor & Redfern, Ltd., 36 Toronto Street, Toronto, are engineers. Gas and electric pumps will be installed.

The Canadian National Railways have started work on the erection of car shops at Edmonton, Alta., to cost $200,000.

D. Brill, Georgetown, Ont., contemplates erecting factory there to cost $10,000.

The Canadian Brake Shoe & Foundry Co., 354 St. James Street, Montreal, contemplates erecting a foundry at Sherbrooke, Que.

Fire at the plant of the Groves-Bigwood Lumber Co., Byng Inlet, Ont., caused damage to machinery and buildings to the amount of $175,000. The power plant and planing mill are a total loss.

The Bruce Wood Workers, Ltd., Chesley, Ont., are in the market for a 30-hp., 60-cycle, three phase, 220 volt motor.

The round house and machine shop owned by the Eastern British Columbia Railway at Cordin, near Fernie, B. C., were totally destroyed by fire Aug. 21, with loss to buildings and equipment estimated at $70,000.

The Dryden Paper Co., Dryden, Ont., is making progress in the development and expansion of its plant. It is developing a further 1200 hp., and the paper plant is being enlarged with a view to doubling the present capacity. A small ground wood mill is also being constructed.

The Brightman Mfg. Co., Columbus, Ohio, manufacturer of finished steel, shafting machinery and cold-finished nuts, which for 26 years has been jointly owned by L. H. Brightman, Long Beach, Cal., and his seven children, now passes into the control of Mrs. Brighton, who will operate the business with the assistance of S. D. Shearer, Cleveland, her brother-in-law. The business was brought to Columbus 12 years ago from Shelby, Ohio. L. H. Brightman has not been active for several years. In the near future the four sons will erect a plant at Columbus, to manufacture the same products and an added line of screw machine products.

At the directors' meeting of the Sharon Pressed Steel Co., 47 West Broadway, New York, held Aug. 7 to fill vacancies in the directorate and executives, the following officers were elected: H. W. Torney, president; A. E. Swan, vice-president; T. A. Pierce, treasurer; Harold G. Mosier, secretary. The retiring directors were: W. L. Ulmer, W. H. Watkins, L. L. Knox and W. J. Parker. These vacancies were filled by L. B. Le Bel, vice-president and director Cleveland Discount Co.; Edward O. Peck, secretary and director Cleveland Discount Co.; Harold G. Mosier, attorney, Cleveland, and A. E. Swan, first vice-president Sharon Pressed Steel Co.

NEW TRADE PUBLICATIONS

Pumps.—The Trane Co., La Crosse, Wis., Bulletin No. 2, a handbook of practical information on condensation, circulating and similar pumps. The bulletin has been enlarged from an 8-page bulletin which was exclusively devoted to Trane condensation pumps, the present 24-page publication being the company's response to requests from its customers for practical information on other pumps used for the mechanical equipment of buildings. It is intended especially for engineers, architects and heating contractors.

Hoists.—The Northern Engineering Works, Detroit. Bulletin illustrative and descriptive of type D electric hoist, electrically operated and portable. The hoist comes in three sizes of 500, 1000 and 2000 lb. capacity.

Mine Apparatus.—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Illustrated publication of 64 pages on mining apparatus. In addition to line material, the publication, known as Catalogue 6-M, contains much information about mine safety switches, Frankel solderless connectors, tapes, babbitts, solders, micarta gears, mine locomotives and mine locomotive headlights.

Centrifugal Pumps.—Pennsylvania Pump & Compressor Co., Easton, Pa. Bulletin No. 202 describing the company's line of double suction single stage centrifugal pumps and containing useful engineering data.

Railroad Equipment.—Whiting Corporation, Harvey, Ill. Catalog No. 160, 12 in. x 9 in. Devoted to improved methods in hoists and transfer tables. Data are supplied comparing methods in use. A model plant layout and hoist installment are shown in blueprints. The catalog is elaborately illustrated on coated paper, the larger share of the 52 pages being devoted to actual pictures, with brief, direct descriptions.

Mayari Pig Iron.—Bethlehem Steel Co., Bethlehem, Pa. Booklet 19. Treating of the native content of various elements in Mayari pig iron, with particular reference to its qualifications for making castings. Fractures of the iron of varying silicon content are shown, with descriptions and illustrations of its uses, such as power plant headers, motor cylinders, etc. The introduction portrays the region where the nickel-chromium Mayari ore is obtained. In the last three of the 30 pages appears complete analyses in tabular form of products made from Mayari ore.

Metal Sash.—David Lupton's Sons Co., Philadelphia. Catalog No 11. Consisting of 191 pages, elaborately bound, tracing the advance in making sold steel sash for commercial and residential buildings. Improvements for securing abundant fresh air and sunlight are described and illustrated. Suggestions for builders and helpful hints for ordering and making specifications are given in tables, diagrams and charts. Special tables aim to show the principles governing air currents in large structures. A separate 42-page catalog, similar in design, but with prints in color and tinted pictures, shows the adaptations of modern casements and double-hung windows. By diagram and description special features and new designs are shown.

Factory Drinking Water Systems.—Armstrong Cork & Insulation Co., Pittsburgh. Illustrated booklet, "A Neglected Source of Economy," presenting the merits of modernized drinking water systems in industries, showing possibilities for economy in time and labor.

Cast Iron Storage Tanks.—Conveyors Corporation of America, 326 West Madison Street, Chicago. Booklet, 4 x 8 in., giving details of the construction and installation of the American cast iron storage tank, designed for loose, bulky, dry materials. Engravings show tanks in use. Comprehensive tables of weights and measures employed in tank construction are included.

Oil Burning.—Schütte & Koerting Co., Philadelphia. Catalog devoted to mechanical fuel oil-burning systems and atomizing by low or high pressure air or steam. Installation, use and maintenance of oil-burning agents are covered at length. The relative merits of mechanical spray oil burners, the purpose of air control registers, and the effects of carbon deposits are demonstrated. The catalog is richly illustrated in colors and contains 25 tables of valuable data.

Material Handling.—Roeper Crane & Hoist Works, 1720 North Tenth Street, Reading, Pa. Catalog No. 52, which illustrates and describes trolleys, chain hoists, turntables and switches, and also shows by descriptive diagrams the relation of parts when installed.

Shears.—Niagara Machine & Tool Works, 637 Northland Avenue, Buffalo. A special bulletin treating on the proper care of squaring shear knives and carrying instruction in attaching, regrinding and adjustment. Suggestions for shear tests are offered.

Architects' Hand Book.—Truscon Laboratories, Caniff and Grand Trunk Railroad, Detroit. An architects' and engineers' aid, entitled, "Architects' Specification Handbook," of 108 pages, 8½ x 11 in. in size, in loose leaf binding. The specifications relate especially to waterproofing, damp-proofing or other coating work.

Boiler Tubes.—Parkesburg Iron Co., Parkesburg, Pa. Illustrative folder sketching in brief the processes of making charcoal iron boiler tubes.

Wire Forming and Special Machinery.—Baird Machine Co., Bridgeport, Conn. Circular outlining the needs and development in machinery for specific industries, sprinkled with human interest discussions of a business flavor. Some 25 Baird bulletins on special machinery are listed on the back cover.

Optical Pyrometer.—Scientific Materials Co., Pittsburgh. Generously illustrated. 16-page booklet, 6 x 10 in., giving a scientific exposition on the theory, design and use of the F. & F. pyrometer, and including a Fahrenheit-Centigrade conversion table, formulas governing pyrometer construction, and tables for determining the true when given the apparent temperature.

Ash Conveyor.—United Conveyor Corporation, 1500 Old Colony Building, Chicago. Bulletin 105, contrasting old and new methods of ash disposal. Illustrations and lettered diagrams give data on installing the equipment.

Feed Water Softeners.—Graver Corporation, East Chicago, Ind. Bulletin No. 504, covering feed water softening in steam power plants and the Graver hot process water softener, designed especially for such work. The booklet consists of 20 pages and goes into the subject with thoroughness.

Motor Starters.—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Folder 4500, describing a line of motor starters, with numerous comprehensive illustrations.

Tumbling Barrels.—J. W. Paxson Co., Philadelphia. Bulletin No. 40, superseding No. 27, pages 36, gives complete illustrated information concerning steel channel stave rumbler tumbling barrels and cleaning room equipment.

Hardening Furnaces.—Tate-Jones & Co., Inc., Pittsburgh. Illustrated bulletin No. 164-B, superseding 164-A, describes general hardening furnaces of the semi-muffler type for oil or gas fuel.

Automatic Electric Hardening Furnaces.—Automatic & Electric Furnaces, Ltd., 281 Gray's Inn Road, London, England, W. C. 1. Illustrated description and discussion of the principles and applications of the Wild-Barfield automatic furnaces for the correct hardening of steel.

Electric Heating Furnaces.—F. J. Ryan & Co., Philadelphia. Pamphlets, Common Sense Talks Nos. 1 and 2 on "Electric Heat; What Is It"? and "The Electric Resistor."

New Books Received

Mexican Petroleum. Pages 300, 5½ x 7¾ in. Published by the Pan American Petroleum & Transport Co., 120 Broadway, New York, N. Y.

World Metric Standardization. By Aubrey Drury. Pages 524, 6 x 9 in., illustrated. Published by World Metric Standardization Council, 681 Market Street, San Francisco. Price, $5.

The Journal of the Institute of Metals.. Vol. XXVII. Edited by G. Shaw Scott, secretary. Pages 621, 5¼ x 8½ in., illustrated. Published by the Institute of Metals, 36 Victoria Street, London, S. W. I. Price, 31s. 6d.

Petroleum, Where and How to Find It. By Anthony Blum. Pages 367, 4¾ x 6¾ in. Published by the Modern Mining Book Publishing Co., 905 North Dearborn Street, Chicago. Price, $2.

Factory Storeskeeping. By Henry H. Farquhar. Pages 182, 6 x 9 in.; illustrations 36. Published by McGraw-Hill Book Co., Inc., 370 Seventh Avenue, New York. Price, $2.50.

Methods of the Chemists of the United States Steel Corporation for the Sampling and Analysis of Pig Iron. Pamphlet, pages 40, 6 x 9 in. Published by the Carnegie Steel Co., Bureau of Instruction, Pittsburgh.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossbile to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

Bars:	
Refined iron bars, base price	2.94c.
Swedish bars, base price	7.00c.
Soft steel bars, base price	2.94c.
Hoops, base price	4.14c.
Bands, base price	3.74c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	3.04c.
Channels, angles and tees under 3 in. x ¼ in., base	2.94c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	2.94c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.14c.
Toe-calk, ½ x ⅜ in. and larger	4.00c.
Cold-rolled strip, soft and quarter hard	6.25c. to 7.25c.
Open-hearth spring steel	4.25c. to 6.00c.
Shafting and Screw Stock:	
Rounds	3.65c.
Squares, flats and hex	4.15c.
Standard cast steel, base price	12.00c.
Extra cast steel	17.00c.
Special cast steel	22.00c.

Tank Plates—Steel

¼ in. and heavier	3.04c.

Sheets

Blue Annealed

	Per Lb.
No. 10	4.04c.
No. 12	4.09c.
No. 14	4.14c.
No. 16	4.24c.

Box Annealed—Black

	Soft Steel C. R., One Pass, Per Lb.	Blued Stove Pipe Sheet, Per Lb.
Nos. 18 to 20	4.15c. to 4.40c.	....
Nos. 22 and 24	4.20c. to 4.45c.	4.60c.
No. 26	4.25c. to 4.50c.	4.65c.
No. 28	4.35c. to 4.60c.	4.75c.
No. 30	4.60c. to 4.85c.	....

No. 28 and lighter, 36 in. wide, 10c. higher

Galvanized

	Per Lb.
No. 14	4.45c. to 4.70c.
No. 16	4.60c. to 4.85c.
Nos. 18 and 20	4.75c. to 5.00c.
Nos. 22 and 24	4.90c. to 5.15c.
No. 26	5.05c. to 5.30c.
No. 27	5.20c. to 5.45c.
No. 28	5.35c. to 5.60c.
No. 30	5.85c. to 6.10c.

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
⅛ in. Butt	—53	—38	¾ in. Butt	—23	—5
¼ in. Butt	—58	—45	1½ in. Butt	—25	—7
1-3 in. Butt	—60	—47	2 in. Lap	—19	—3
2½-6 in. Lap.	—57	—44	2½-6 in. Lap	—23	—7
7-8 in. Lap	—53	—30	7-12 in. Lap	—15	+1
9-12 in. Lap.	—49	—30			

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	3.50c. to 3.75c.
Annealed soft	3.50c. to 3.75c.
Galvanized annealed	4.25c. to 4.50c.
Coppered basic	4.00c. to 4.25c.
Tinned soft Bessemer	5.50c. to 5.75c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	18¾c. to 19¾c.
High brass wire	19¼c. to 20¼c.
Brass rod	16¼c. to 17¼c.
Brass tube, brazed	25⅝c. to 26⅝c.
Brass tube, seamless	22½c. to 23 c.
Copper tube, seamless	24¾c. to 25 c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 21¾c. to 22¾c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14-20		
	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	Primes	Wasters
			80 lb.	$6.05	$5.80
			90 lb.	6.15	5.90
			100 lb.	6.25	6.00
IC	$10.00	$8.50	IC	6.40	6.15
IX	11.50	10.00	IX	7.40	7.15
IXX	13.00	11.25	IXX	8.40	8.15
IXXX	14.25	12.50	IXXX	9.40	9.15
IXXXX	16.00	14.00	IXXXX	10.40	10.15

Terne Plates

8-lb. coating, 14 x 20

100 lb.	$7.00
IC	7.25
IX	7.50
Fire door stock	9.00

Tin

Straits, pig	36c.
Bar	43c. to 47c.

Copper

Lake ingot	15¼c.
Electrolytic	15 c.
Casting	14¾c.

Spelter and Sheet Zinc

Western spelter	8 c. to 8½c.
Sheet zinc, No. 9 base, casks	9c. open 9½c.

Lead and Solder*

American pig lead	6¾c. to 7c.
Bar lead	8c. to 8½c.
Solder, ½ and ½ guaranteed	25c.
No. 1 solder	23½c.
Refined solder	20¼c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	75c.
Commercial grade, per lb.	35c.
Grade D, per lb.	25c.

Antimony

Asiatic	6½c. to 7c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb. 25c. to 27c.

Old Metals

Business is quiet but the market holds up fairly well. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	11.75
Copper, heavy wire	11.25
Copper, light and bottoms	9.25
Brass, heavy	6.25
Brass, light	5.25
Heavy machine composition	8.50
No. 1 yellow brass turnings	6.50
No. 1 red brass or composition turnings	8.00
Lead, heavy	4.50
Lead, tea	3.50
Zinc	3.25

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Making Steel Without Using Pig Iron

"Scrap and Carbon" Basic Open-Hearth Process as Employed at an Eastern Plate Mill—Residual Manganese an Essential Feature

BY EDWIN F. CONE

INDEPENDENT of fuel or pig iron scarcity, a Pennsylvania producer of steel plates is operating at 100 per cent capacity, and in August broke its record in open-hearth output. It has been known for some time that the Central Iron & Steel Co., Harrisburg, Pa., was making steel in a manner different from the practice at any other open-hearth plant in the country. Various reports concerning the metallurgical operations have gained currency, some of them entirely at variance with the actual procedure. With a view to presenting the facts, the writer visited the plant and secured information for this article from Robert H. Irons, president of the company; Robert M. Keeney, general superintendent; Sidney D. Williams, superintendent of the open-hearth department, and Ashton D. Peace, engineer of tests.

Basic open-hearth steel of high quality is being produced daily at Harrisburg without the use of any pig iron, but entirely from scrap. In fact, no pig iron has been used in the company's six large open-hearth furnaces since late in 1918. Three blast furnaces on the property, which have been idle since late in the war, are mute testimony to what has been going on in the steel department.

Steel has been made in basic open-hearth furnaces without the use of pig iron in several other instances. The substitution of petroleum coke for pig iron was practiced by several American companies during the war, as it had been here and there in years previous, and it is still followed to some extent on the Pacific Coast, where the dependence of steel companies is chiefly on scrap. At various other plants also departures are being made from the established pig and scrap process; but the Central Iron & Steel Co.'s practice differs from them all.

The first reaction to the statement that pig iron is eliminated and only scrap is the basis of a heat is likely to be criticism. It has been the common view that quality steel could not be made in open-hearth furnaces except virgin iron, as pig iron, was a part of the charge. Yet high grade tool and alloy steels are made in electric furnaces in which not a pound of pig iron is used. It is possible to produce by an all-scrap process quality steel in quantity in basic open-hearth furnaces and at a low cost. The Harrisburg company has been doing this for more than four years, and under several sets of exacting specifications. To-day it is shipping tank, fire box, boiler and other grades of plate into Pittsburgh and the Middle West and into other markets not commonly regarded as tributary.

TWO facts are outstanding in connection with the open-hearth process described in this article.

One is the advantage of independence of pig iron supply, which is emphasized in this time of fuel shortage. The other is the key feature of the operation, namely, the maintenance of residual manganese throughout the heat.

A charge consists of varying proportions of the following raw materials:

Scrap steel
Scrap iron
Manganese ore
Carbon as river coal, coke or charcoal
Lime

For the past four years plate steel has been made at Harrisburg without the use of any pig iron.

The steel-making process under which the Central Iron & Steel Co. is operating is covered by a process patent (U. S. 1,345,192—June 29, 1920), granted to Robert H. Irons and assigned to the company. Patents have been allowed in various other countries and some foreign applications are pending. The distinguishing feature of the process is the maintenance of a high residual manganese throughout the period of the heat.

For several years the use of manganese-bearing pig irons in open-hearth practice has been advocated, and the subject has been discussed in various papers before the American Iron and Steel Institute and the American Institute of Mining and Metallurgical Engineers.* The presence of certain quantities of manganese during the melting down period now characterizes the operation both in acid and basic open-hearth steel making at many plants. The practice at Harrisburg may be considered as the

*"Utilizing Domestic Manganese Supplies," THE IRON AGE, Nov. 29, 1917, p. 1291; "Manganese in the Basic Open-Hearth," THE IRON AGE, Nov. 29, 1917, p. 1305; "Manganese Conservation in Steel Making," THE IRON AGE, June 6, 1918; "Manganese Alloys in Open-Hearth Practice," THE IRON AGE, May 22, 1919, p. 1363; "Use of Manganese Alloys in Open-Hearth Steel Practice," THE IRON AGE, April 17, 1919, p. 1012, and "High Manganese Iron in Basic Open-Hearth Practice," by E. A. Wheaton, THE IRON AGE, Oct. 28, 1920, p. 1112.

development of this feature to its largest possibilities.

Two well-known features of open-hearth practice are at once recognized in reading the patent. First, the use of carbonaceous matter to reduce the charge of pig iron; second, the use of manganese-bearing materials, thereby bringing about the elimination of sulphur as manganese sulphide, and securing the advantage of tapping with a high residual manganese. The patentee claims that steel made by his process is of superior quality by reason of the high residual manganese and the care with which the steel is made, and that it has several advantages over steel made by the ordinary pig and scrap process.

To secure this residual manganese, high grade manganese ore from Brazil is regularly a part of each charge. About 2 to 2½ tons is ordinarily used in a 90-ton heat. The reduced manganese from the ore is alloyed with the steel, the slag being at the same time brought to the point of saturation with manganese. The desired manganese in the bath is thus obtained, and at the time when the heat is ready for tapping the amount of residual manganese is fairly constant at 0.15 to 0.30 per cent. To prevent the steel from losing any of this residual manganese because of insufficient oxide of manganese in the slag, the capacity of the slag in lime and oxide of iron is increased which, combined with the manganese oxide acting as a base, exerts the desired effect on the manganese of the bath.

The rôle of this residual manganese is two-fold: First, its presence during the whole refining operation prevents any oxidation of the iron in the bath; second, it is an important factor in eliminating sulphur.

Aside from the manganese ore and the regular and necessary amount of lime, the charge is made up of scrap steel and scrap iron in proportions varying from 60 to 90 per cent of the former and from 40 down to 10 per cent of the latter, largely heavy melting grades. The regulation of the mixture depends on market conditions and requires a constant study of the price and availability of the scrap brought in from outside. The flexibility of the charge is its feature, it being possible to make a heat with 90 per cent steel scrap or up to 40 per cent scrap iron, with no variation in quality.

Another factor in the charge is carbon in the form of coal, coke or charcoal, the amount depending on conditions. A most interesting feature of present operations is the use of river coal, really buckwheat anthracite. Tons of this are being taken daily from the Susquehanna River, which parallels the plant. The coal is carefully washed, dried and screened and used in each charge in varying proportions with the scrap and other materials. It furnishes carbon and plays other lesser rôles in the refining process. The same coal at present is fired under boilers to raise the steam used in the plant.

The purifying effect of the residual manganese, which is the key to the success of this unique "scrap and carbon" process, is not a new principle, but the method of its application is. All ingots are bottom poured, requiring a metal of high temperature. Special features in the construction and operation of the furnaces make the attainment of this temperature easy and the presence of the manganese prevents oxidation. The surface of the ingots is unusually smooth, with piping and blowholes at a minimum. Although a larger slag volume is carried than in the regular pig and scrap method, there is no difficulty in operating the heats for one acquainted with all the details and refinements of the process.

Heats are regularly made not exceeding 0.05 per cent in sulphur, more often much less, and the phosphorus content is normal. Physical tests, made by inspectors representing railroads, the Government and other buyers, reveal a high elongation and reduction of area. Typical results from the company's records, taken at random, are given in the table. In fact it has been a surprise to the operating forces to find that steel made by this process has higher properties than steel of the same analysis made in the old way. The management states that yields are larger than in the former practice, and the fact that the total rejections of finished plates, including shipping errors, shearing mistakes, qualities of the steel, etc., are less than three-quarters of one per cent of the finished product, justifies the management's statements as to larger yields. In other words, 99.25 per cent of the finished product as manufactured meets all requirements.

The stage to which the process has been brought has not been reached easily. Many difficulties have had to be overcome, and success requires constant watchfulness and a high-grade organization with an open mind. The results represent seven years of operation and research on the part of the inventor, together with large expenditures for experimental purposes.

Equipped for the use of either producer gas or oil, the furnaces are largely using fuel oil. River coal supplies other needs besides its rôle in the steel making. Coke is unnecessary in any department, and pig iron is and has been a stranger outside the gates for several years.

Table of Certified Physical and Chemical Tests of Fire Box and Boiler Steel Plate Made by Central Iron & Steel Co.

Heat No.	Description of Plate	Dimensions of Test Piece: Width, In.	Thickness, In.	Area, Sq In.	Yield Point: Lb. Per Sq. In	Ultimate Strength: Lb. Per Sq. In.	Final Elongation in 8-In. Per Cent	Reduction of Area Per Cent	Carbon Per Cent	Manganese Per Cent	Phosphorus Per Cent	Sulphur PerCent
12003	392 x 48 x⅜	1.575	0.377	0.594	37710	55220	33.0	63.0	0.15	0.46	0.017	0.037
12017	131 x 52½x⅜	1.535	0.375	0.576	38720	58520	28.0	56.2	0.16	0.30	0.016	0.040
22209	132 x 42 x1¼	1.500	1.250	1.875	35700	52590	29.0	57.3	0.15	0.31	0.016	0.034
22218	245 x 49 x⅜	1.490	0.385	0.574	35300	57800	28.0	61.7	0.16	0.35	0.017	0.040
22231	328 x 54½x⅜	1.575	0.385	0.606	37470	62210	28.0	60.4	0.22	0.33	0.017	0.033
42067	229⅜x 87½x⅜	1.570	0.585	0.919	35000	59600	32.0	58.2	0.20	0.48	0.016	0.034
42070	132 x 42 x1¼	1.465	1.250	1.838	35200	52990	30.0	56.5	0.12	0.36	0.018	0.030
42074	228 x 72½x.53125	1.440	0.546	0.786	35300	59800	30.0	61.8	0.19	0.34	0.015	0.037
52101	245 x 49 x⅜	1.420	0.428	0.608	35000	60300	30.0	60.5	0.20	0.45	0.015	0.030
52108	318 x 52½x⅜	1.585	0.383	0.645	37370	59550	28.0	62.8	0.18	0.50	0.019	0.040
52109	492 x 54½x⅜	1.575	0.377	0.594	39060	63470	27.0	56.2	0.20	0.46	0.016	0.035
52118	318 x 52½x⅜	1.570	0.365	0.573	35430	55330	33.0	65.4	0.16	0.50	0.017	0.040
52126	104¾x104¾x1¼	1.510	0.692	1.045	35120	55400	31.0	57.9	0.18	0.42	0.016	0.030
52127	220 x 81½x⅜	1.540	0.440	0.678	35200	55160	32.0	67.5	0.16	0.39	0.022	0.040
52128	247½x 88½x⅜	1.485	0.681	1.011	35400	55390	35.0	60.4	0.18	0.39	0.018	0.040
52136	228 x107⅜x.48	1.480	0.475	0.703	35560	59320	34.0	58.1	0.19	0.50	0.022	0.040
62104	187⅞x 64½x.44	1.410	0.443	0.625	35300	55200	34.0	61.6	0.18	0.48	0.015	0.037
62106	190½x 64½x.44	1.450	0.436	0.632	35200	58300	29.0	65.2	0.17	0.42	0.017	0.034

IMPORTANT COAL TOPICS

Southern Ohio Pig Iron and Coke Association Considers Various Problems

The August meeting of the Southern Ohio Pig Iron and Coke Association was held at the Marting Hotel, Ironton, Ohio, Aug. 29. The meeting was called primarily to discuss the present coal situation, and after hearing reports from various members of the association, it was decided that, inasmuch as the volunteer and appointed coal committees were ceasing to function, any matters pertaining to fuel in the southern Ohio territory should be taken up direct with the Interstate Commerce Commission, and the following telegram was despatched to the secretary of that body:

The members of this association operating a number of blast furnaces and by-product coke plants in southern Ohio and eastern Kentucky believe that the opening of Ohio, Indiana and Illinois mines has modified conditions which brought about your Service Order No. 23. Conservation of transportation facilities will mean the forwarding of coal from these short haul mines to the Great Lakes and Northwest, thereby releasing for industrial purposes the by-product coal of West Virginia and eastern Kentucky. We therefore urgently ask that immediate consideration be given to the amendment of Service Order No. 23, whereby this coal will resume its usual course of consumption. Only by this action do we believe complete paralysis of the pig iron and steel industry in this district will be averted.

Good Work of Blast Furnaces

A most interesting discussion regarding the good work done at blast furnaces in the district took place, and it was the consensus of opinion among the operators that a great deal of the credit can be traced to the good, clean coal supplied to the coke plants. The association is pushing its activities along this line among the coal operators and is meeting with fairly satisfactory co-operation.

It was forcibly brought out at the meeting that the shipment of high volatile coal from West Virginia and Kentucky to the Northwest, as railroad fuel and domestic fuel, was a most wasteful diversion of coal that should go direct to the coke ovens. The long haul across two or three States and the shipment by boat required so much fuel and so much coal car capacity that it seemed a shameful practice. The members all advocated as short and direct a haul as possible so that coal cars would be kept on the home lines, especially in the production of by-product coke. The need for shipping clean coal as a matter of conservation of car supply was also brought out.

Elevating the Coal Industry

An interesting discussion on the question of having the coal industry put on the same high plane as that of the iron ore industry, took place. President Sweetser felt that if the same attention was given to the quality and the marketing and the mining of coal as is given to the iron ore trade, there would be no such confusion and difficulties as now pravail in the coal industry. More attention should be paid to shipping the kind of coal best suited to the needs of the consumer. W. D. McKinney, secretary of the Southern Ohio Coal Exchange, thought that if the Government would license coal mines and give each mine a number which would follow a car of coal through to the ultimate consumer, there would be some kind of responsibility attached to a car of coal as is now attached to a car of iron ore. Although some of the members thought it would be too great a job to educate 15,000 wholesale coal men in the country, it was felt that much good could be done by hindering the shipment of coal from mines that furnished notoriously inferior coals.

F. W. Davis of the Bureau of Mines explained the experiments that are being conducted on the combustibility of coke, and also described some of the experimental work planned by the bureau. The association voted that complete co-operation would be given to the bureau, especially in the experiments that are going to be conducted at the blast furnaces of one of the members.

Five new members were elected, these being Dr. Lowry, Ironton; C. E. Burch, and C. O. Brown, Jackson; Henry Willard, Wellston, and Thos. DeVenny, of the Portsmouth By-Product Coke Co.

Reports submitted to the association showed that 14 of the 17 blast furnaces represented are blown out or banked on account of coal shortage.

In the evening, the customary dinner, presided over by President R. H. Sweetser, was held, at which addresses were made by members of the association and their guests. A nominating committee was also appointed to draw up a list of officers which will be submitted to the annual meeting to be held later in the month.

Program for Montreal Meeting of American Electrochemists

The program for the annual fall meeting of the American Electrochemical Society at Montreal, Canada, Sept. 20, 21 and 22, is announced in part as follows:

Wednesday, Sept. 20

6:00 p. m.—Registration at Windsor Hotel.

Thursday, Sept. 21

10:00 a. m.—Session for reading and discussion of papers:

"Effect of Heat Treatment on the Hardness and Microstructure of Electrolytically Deposited Iron," by Norman B. Pillings.

"The Preparation and the Mechanical Properties of Vacuum Fused Alloys of Electrolytic Iron with Carbon and Manganese," by R. P. Neville and J. R. Cain.

"The De-Zincification of Brass," by Ralph B. Abrams.

2:00 p. m.—Session on "Industrial Heating"; Bradley Stoughton, chairman, electrothermic division:

"The Underlying Principles of the Industrial Heating Problem," by Charles P. Steinmetz.

"Electric Heat: Its Generation, Propagation and Application to Industrial Processes," by E. F. Collins.

"Principles of High Temperature Furnace Design," by E. J. Smalley.

"Advantages of Industrial Electric Heating," by Wirt S. Scott.

"Some Electrical Properties of Alloys at High Temperatures," by M. A. Hunter and A. Jones.

"Resistivities of Some Granular Resistor Carbons," by C. E. Williams.

"Heat Insulating Materials for Electric Heating Apparatus," by J. C. Woodson.

Friday, Sept. 22

9:30 a. m.—Session on "Industrial Heating"; Part II:

"Methods of Economically Handling Materials in Electric Furnaces," by Frank W. Brooke.

"The Development of Industrial Electric Heating for Low Temperature Enameling," by Wirt S. Scott.

"Treatment of Ceramics," by E. T. Smalley.

"Electric Annealing of Malleable Iron," by C. B. Gibson.

"Electric Steam Generators and their Application," by P. S. Gregory.

"A New Type of Induction Furnace," by J. Murray Weed.

"A Simple Electric Crucible Furnace for Melting Aluminum," by A. Glynne Lobley.

2:00 p.m.—Reading and discussion of papers on miscellaneous electro metallurgical subjects.

8:00 p. m.—Smoker at Windsor Hotel.

11:30 p. m.—Special Excursion to Shawinigan Falls. Train leaves Windsor Station at 11.30 p.m. The return train from Shawinigan Falls will arrive in Montreal on Saturday evening in ample time to permit members wishing to make connections for all through night trains to Toronto, Buffalo, Niagara Falls, Chicago, New York, Boston, Philadelphia, Washington, et al.

An illustrated lecture by Prof. A. S. Eve, on "The New Philosophy of Physics," will be given Thursday evening.

Underneath the Ore Bins, Showing the Continuous Line of Segmental Gates for Filling the 80-Cu. Ft. Capacity Scale Car, Which Appears in the Background

Blast Furnace Rebuilt to Save Labor

Mechanical Charging Equipment Installed on 17 x 75-Ft. Furnace of Emporium Iron Co.—New Bins and Pig Casting Machine

BUILT during the years 1887-88, the plant of the Emporium Iron Co., Emporium, Pa., has operated since that time with substantially the original equipment. During the past year, however, the old hand-filling system has been replaced with a complete new set of storage bins, skip bridge, furnace top, etc. The furnace has been relined and partially remodeled, and new mechanical pig casting equipment installed. Arthur G. McKee & Co., Cleveland, as engineer and contractor for the reconstruction work, did the designing and erection.

The alterations to the furnace below the mantle consisted of installing a new hearth jacket, 8 ft. deep by 16 ft. 4 in. inside diameter, made up of 1⅛ in. steel plate. Twenty-one cast iron hearth cooling plates were provided, approximately 8 ft. long by 2 ft. wide and 3 in. thick. The old copper coolers were utilized, no new copper being furnished. Eight new tuyere stocks were installed, including elbows, blow pipes and base castings for attaching to the bustle pipe.

The storage bin and trestle structure, of steel and reinforced concrete, is approximately 432 ft. long. The coke bin, occupying three bays in the trestle structure, is 48 ft. in length and is made up of steel plate sides and bottom, suspended from the concrete bents. This coke bin is centrally located, discharging direct into the skip car, over cascade type coke screens.

Eight ore and limestone bins of the Baker suspension type were installed, each bin being approximately 12 ft. in length and constructed of ⅜ in. steel plate sides and bottom. The bins are provided with a continuous line of segmental type gates arranged for convenient operation from the scale car platform, and discharge into an 80 cu. ft. capacity scale car, which delivers the material to the skip pit. The scale car is of heavy construction, electrically driven and equipped with air brakes.

The charge is carried to the furnace top in a skip car of 80 cu. ft. capacity, traveling on a single track skip bridge, which is provided with deck plates to prevent materials falling through to the ground. The skip is supported by a hinged leg from the furnace top platform, and rests on the old hoist tower as an additional means of support. At the upper end of the skip bridge is provided a sheave platform with a 5 ft. diameter cast iron sheave for accommodating the 1 in. plow steel skip hoist cable, idler sheaves being placed at different points along the bridge. A 12 x 12-in. single drum Otis hoisting engine was installed in a brick hoist engine house, having concrete foundations and steel roof supports.

No changes were made to the existing furnace shell, a new top ring casting being furnished to fit the present design. There was also provided a new large bell hopper, made of cast steel in four sections, and a new gas seal of ½-in. steel plate with cast steel bottom ring and cast iron top ring. The gas seal contains two hinge type manholes, 30 in. in diameter, for removal or inspection of the small bell.

On top of the gas seal is mounted a McKee revolving stock distributer, consisting of small bell, bell hopper, small bell rod, ball races and drive mechanism. For its operation a 7½-hp. Crocker-Wheeler, 220-volt, d.c. motor was supplied, located on the furnace top platform and inclosed with proper housing. Control of the distributer is accomplished automatically by means of a limit switch connected to the hoist engine drum.

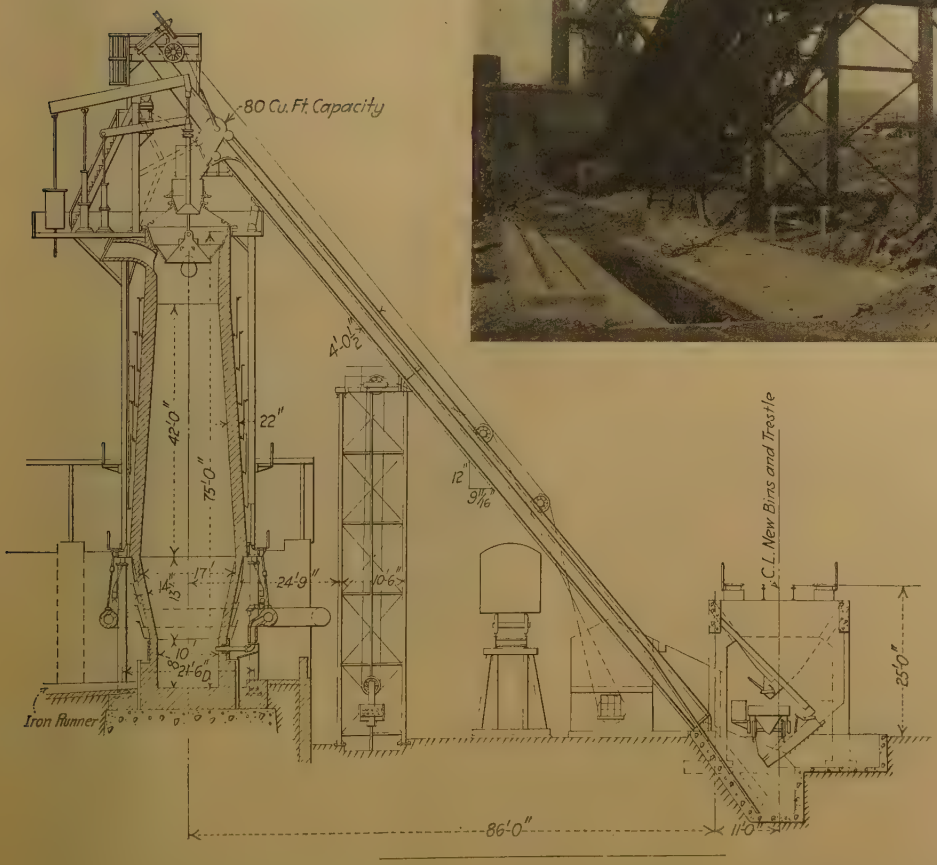
The furnace charge is discharged from the skip car into a receiving hopper constructed of ⅝-in. steel plate and provided with ½-in. wearing plates. Directly beneath this receiving hopper is a revolving hopper, which is of ¾-in. steel plate and which attaches to and revolves with the distributer.

An entirely new furnace top platform was erected.

Supported on the top platform is a hand operated jib crane for raising and lowering the large bell, hopper and other equipment. The operation of the large and small bells is accomplished by means of a bell rig mounted on the furnace top platform and consisting of 14-in. and 10-in. steam cylinders, bell beams, counterweights, bearings and shafts. A modern test rod mechanism and indicator were also installed.

In the cast house, new iron and cinder runners were provided. The iron pours into a 50-ton Pugh type hot metal car and is then transported to the pig casting machine. The latter is a single strand machine furnished by the Pittsburgh Coal Washer Co. It has a speed of approximately 20 ft. per min., carrying one pig mold per foot of chain, each mold casting a pig weighing from 100 to 125 lb.

At Right—Delivery End of the New Single Strand Pig Casting Machine, Showing Chute for Loading the Cast Pig into Cars Below—Section Through the Furnace, Showing the New Skip Bridge, Furnace Top and Storage Bins and Their Relations to Each Other



Employment at Bridgeport

According to the report from the Manufacturers' Association of Bridgeport, Conn., based on the number of employees in 31 Bridgeport factories, industrial activity reached its ebb on Jan. 7, last. From previous data three figures were determined which are to represent the estimated normal as follows:

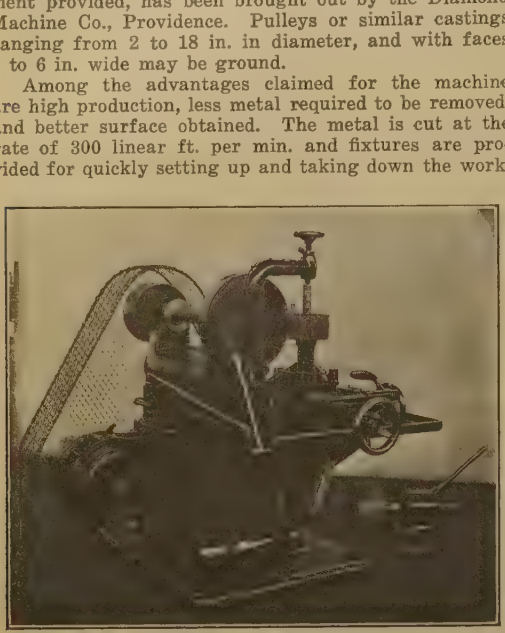
Estimated Normal	
Number of employees	25,318
Number of man-hours	1,240,582
Number average factory hours per week	49

The data show the gradual decline and subsequent increase in all three of these figures over the period from Feb. 5, 1921, to Aug. 31, 1922. On the first date, Feb. 5, the number of employees was 17,392, or 68.6 per cent of the normal. The gradual decline reached low mark on Jan. 7, 1922, with 10,346, or 40.9 per cent of normal. Thenceforth, the number increased steadily with a single break in July to 15,869, or 62.7 per cent of normal for Aug. 26. The percentage of man-hours for the starting date was 54, and the average factory hours per week 81.2 per cent, falling to 32.4 and 80.8 per cent, respectively, then rising to 62.9 and 100.4 per cent, respectively. The average number of hours worked per employee last week was 49.2, or 0.2 hour above the estimated normal.

New Pulley-Grinding Machine

A machine to produce convex, flat or concave faces on pulleys, wheels, rollers and similar pieces and with which the edges may also be faced by using the attachment provided, has been brought out by the Diamond Machine Co., Providence. Pulleys or similar castings ranging from 2 to 18 in. in diameter, and with faces 1 to 6 in. wide may be ground.

Among the advantages claimed for the machine are high production, less metal required to be removed, and better surface obtained. The metal is cut at the rate of 300 linear ft. per min. and fixtures are provided for quickly setting up and taking down the work.



Machine Designed for Grinding Pulleys Having Either Crown or Straight Face

As an example of the production it is stated that 6-in. pulleys with ¾ in. face have been ground in 24 sec. to 2½ min. and 8-in. by 4-in. pulleys in 1 min. 50 sec. to 4 min. and 20 sec., the time varying according to stock removed and finish required. Pulleys 12 in. by ¾ in. have been ground in approximately 2½ min. In the company's own production the grinding time from floor to floor on 18 in. by 4½ in. pulleys was 10 min. each; and on 9 in. by 4½ in. pulleys, 3 min. each.

A substantial chuck, 15 in. outside diameter, with an abrasive wheel 14 in. outside diameter, 1-in. face, constitutes the grinding unit. The spindle is mounted in ball bearings and runs at 1500 r.p.m. Cutting speeds may be varied by changing the back gears. The machine is driven by a 10 hp. 1800 r.p.m. motor, with silent chain drive to the spindle.

The floor space occupied is 3½ by 4½ ft. and the weight of the machine approximately 2000 lb. The height of the spindle from the floor is 44 in. The machine is equipped with a vertical spindle pump provided for wet grinding, which has an adjustable spray nozzle, and ample passages to the sediment tanks.

The edge-facing attachment can be put on or removed in 2 or 3 min. and heavy permanent dowels, as well as large holding-down screws are incorporated to assure alinement with the machine. The weight of the attachment is about 50 lb.

The Morris Metal Products Co., with plants at Bridgeport, Conn., was purchased Aug. 31 by Kenneth W. McNeil, president Karm Terminal Co., Bridgeport, for $220,500. The property was sold by order of the United States District Court. The purchase includes three manufacturing buildings, including a two-story 190 x 373 brick and steel machine shop structure.

Powdered coal will be used for the new Cahokia station of the Union Electric Light & Power Co., St. Louis. The equipment will be provided by the Combustion Engineering Co., 43 Broad Street, New York, and will include 10 Raymond six-roller low side mills for grinding the coal.

Decrease in German Coal Output

The increasing importation of British coal into Germany is due primarily to the decrease in German production which has been going on steadily since March, when the peak of post-war production was reached, says Vice-Consul Davis, Berlin, in a report to the Department of Commerce. Statistics of production for the first five months of the year are here presented:

Months	Working Days, Number	Production	
		Total, Tons	Daily Average, Tons
January	25	8,132,763	322,090
February	24	7,737,974	322,416
March	27	9,014,278	333,862
April	23	7,512,646	326,637
May	26	8,081,951	310,844

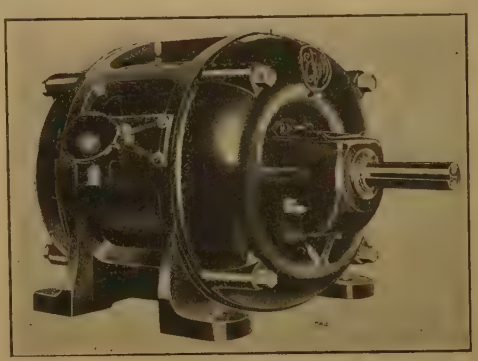
Mr. Davis's report states it is estimated that the average daily production for June will be less than 300,000 metric tons. German industrial circles, the report continues, are much concerned over the constantly rising cost of German coal as compared with British.

Statistical reports show fuel exports from Germany to be greater than before the war, and the suggestion has been made, both in the Reichstag and in the press, that all exports of coal be forbidden in order that the needs of German industry may be met without resort to imported fuel. The total export of coal from Germany in 1921 was about 26,500,000 metric tons, including 18,000,000 tons delivered as reparations.

New Squirrel Cage Induction Motor

A squirrel-cage induction motor for which broad claims are made, in view of the incorporation of new ideas in motor design, has been placed on the market by the Electric Controller & Mfg. Co., Cleveland. The advantages claimed include not only mechanical features, but also increased efficiency, power factor and torque.

Careful manufacture is a feature emphasized and in assembling the various parts of the machine no filing or fitting is permitted, the parts being built to fit or being rejected. To assure rigidity and alinement



New Squirrel Cage Induction Motor

the stator frame is cast around the stator laminations. Shrinkage of the frame after pouring puts the laminations under heavy pressure and eliminates the tendency of the motor to become noisy. The frame is of the skeleton type, the major portion of the stator laminations being exposed to the air. Fan blades are used on only a few of the 900 r.p.m. machines and no fan blades are employed on the 1200 and 1800 r.p.m. motors, as most of the cooling is done by the direct contact of the laminations with the air.

Stator windings are impregnated twice, once after the coils are wound and again after the stator is assembled and wired. All coils are form-wound and open-slot construction is used. Bearings are large and each bearing has two oil rings, one of which is said to be sufficient to lubricate adequately, the extra ring being employed as a safety factor. The oil wells are made unusually large to give further protection against hot bearings.

The rotor has cast end rings and the shaft is said to be larger than standard practice demands.

Metal Wool and Methods of Making It

Processes Vary With Raw Materials Used—Shaving a Steel Wire—How the Specialized Apparatus Operates

BY L. W. MOFFETT

DEVELOPMENT of the art of manufacturing metal wool is interestingly reflected in specifications on file in the Patent Office in Washington. Yet but little is known generally of the process of manufacture. The product is employed in a variety of ways as a cleaning and abrasive agent. Among the purposes to which it is put are the grinding and polishing of objects; cleaning floors; and in applying lubricant to car axle journals, with cotton waste or other absorbent capillary material being mixed with it. Material used by the machines making the wool also varies. It includes molten slag, sheet metal and fine wire. The oldest specifications on file, involving patents of Oct. 13, 1885, an invention of Hugh Kennedy and John W. Higgs of Sharpsburg, Pa., called for the use of molten slag. Jets of steam or air, by this method, are blown through or against a small stream of molten slag, by which the latter is converted into fine vitrified fibers.

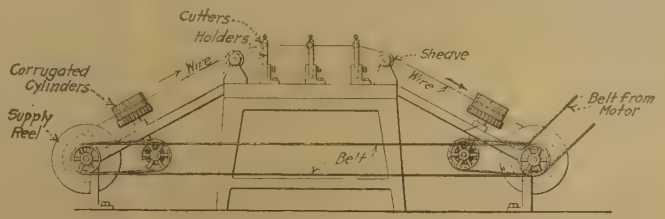
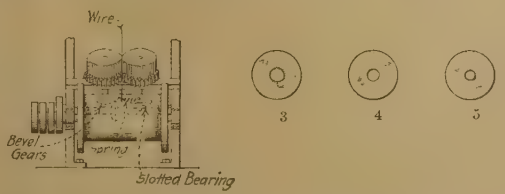


Fig. 1 (Top). Side View of Paton and Koenig Machine Set Up for Operation

Fig. 2 (Lower Left) Shows the Apparatus from One End



Figs. 3, 4 and 5 Are Successive Cutting and Shaping Dies. It will be noted that 3 and 5 have teeth, while 4 is smooth

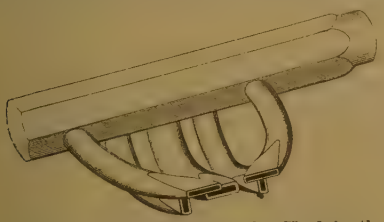


Fig. 7. The Group of Nozzles Used in the Kennedy and Higgs Method of 1885 to Make Metal Wool from Molten Slag

By a patent of Feb. 7, 1899, granted to Sigmund Feust, of New York, a machine makes the wool from sheet metal in the roll. A patent of Nov. 27, 1900, granted to Friedrich Wilhelm Bühne, who described himself as a German citizen, called for the use of thin metal wires from which chips are cut. Only the first named patent had molten slag as the raw material, while all the others used either shot, metal or fine wire. Improvements claimed provided the basis for the patents granted from time to time.

The latest on file is that of Francis A. Paton and Henry L. Koenig, of Fitchburg, Mass. Patented April 8, 1919, their machine successively removes shavings from the surface of a steel wire. The shavings are of suitable fineness so that when bunched together in a mass they constitute steel wool. This being among the later methods of producing steel wool, a description of this process will afford a clear idea of how the art has developed.

The invention resides in the provision of mechanism adapted to produce steel shavings at a rapid rate, by acting upon the entire outside diameter of the wire material, and so arranged as to effect successive reductions in the diameter of the wire, each reduction producing a quantity of shavings of the desired fineness. The invention contemplates the final reduction of the wire material to such a small size that no more shavings can be removed. The wire, when thus reduced in size, still retains its round cross section and is a salable by-product of the machine.

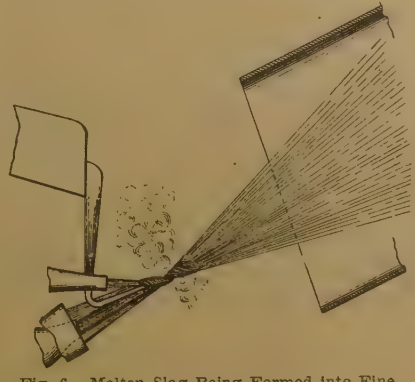


Fig. 6. Molten Slag Being Formed into Fine Vitrified Fibers by the Action of Steam or Air Jets—Kennedy and Higgs Method of 1885

Fig. 1 is a side view of the machine, the parts being shown assembled and in operation. Fig. 2 is a view showing certain of the parts in end elevation. Figures 3, 4 and 5 illustrate various sizes and forms of cutting and shaping devices. The machine includes a number of wire reducing, cutting and shaping devices, which

are mounted upon a stand or support, each device being held in a bracket attached to the support. The brackets have slots or recesses for the reception of holders, which are detachably held in the slots by set screws.

Each holder has near the top a circular recess in one face, the recesses communicating with apertures opening on the other face of each holder for the free passage through of the material or wire. The recess in each holder is provided for the reception of a flat circular cutting or shaping device, of the form shown, for example, by Figs. 3, 4 and 5, respectively, this device filling and fitting snugly within the recess, and detachably held in it by means of a set screw which may engage a depression on the periphery of the device to hold it firmly and rigidly in position.

Elements of the Machine

At each end of the support, beyond the alined cutting and shaping devices above described, is provided a guiding sheave for the wire in its passage to and from the cutting and shaping devices. As shown in Fig. 1, the wire is assumed to be traveling in the direction of the arrow, the wire being drawn from a supply reel at the left side of Fig. 1 and passing between two cylinders whose surfaces are corrugated longitudinally to obtain a bite on the wire. The supply reel is driven through a pulley and belt connection from a second reel, which has rotation imparted to it in either direction, as desired, from a belt connected to a source of power.

Adjacent to the second reel, on which the wire, traveling in the direction of the arrow is wound, are corrugated cylinders identical in construction and arrangement with those adjacent to the supply reel, the surfaces of the cylinders having cooperating longitudinal corrugations to obtain a bite on the wire in its passage between them. The cylinders of each pair are adapted to be rotated in unison through intermeshing spur gears, the teeth of the gears being somewhat elongated and preferably meshing loosely, so as to permit of a slight relative movement of the cylinders toward and from each other as hereafter described, while still maintaining the driving connection.

One cylinder of each pair has its shaft journaled in a fixed bearing on the frame, the shaft having a bevel gear connection in each case with a shaft which has a belt and pulley drive from the shaft of the adjacent reel. The shaft of the other cylinder of each pair is journaled in a bearing which is slidable, transversely, in ways on the framework, a spring operating at all times to draw the sliding bearing and the cylinder toward the other cylinder of the pair, thus causing the longitudinal corrugations of the cylinders to make contact with a wire passing between, regardless of the diameter of the wire.

Method of Operation

In the operation of the mechanism, the wire is threaded through the cutters and shapers carried by the several holders and passed between the two pairs of cooperating cylinders, and then is ready to be wound up on the receiving reel. For operation in this direction, as indicated by the arrow, Fig. 1, the left hand holder carries in its recess a shaping device such as that shown by Fig. 3, there being an aperture running through, with a series of small triangular or pointed teeth formed in its circumference, the diameter at the base of the teeth corresponding substantially with the diameter of the wire. The next holder to the right contains a cutting device, such as that shown in Fig. 4, having a plain aperture running through, corresponding in diameter substantially to the diameter at the apex of the teeth in Fig. 3. The third holder, if it is found desirable to make another reduction in the wire in the same draft, has a shaping device in its recess such as that shown in Fig. 5, having a toothed aperture running through, with the diameter at the base of the teeth corresponding substantially to the diameter of the plain aperture in Fig. 4.

Drawing relatively soft steel wire through alternately toothed and plain shaping and cutting apertures, as described, results in the production of shavings of sufficient fineness to constitute, when assembled, the desired steel wool. The movement of the wire is effected, not only by the draft of the receiving reel but by the bite of the two pairs of cylinders, both pairs rotating in the proper direction to move the wire in the direction of arrow "A."

In the operation as described, the first shaping device, by the action of its teeth, removes a number of fine shavings from the surface of the wire, the latter emerging from the device with its surface having a number of raised portions formed by the scoring action of teeth. These raised portions are shaved off or removed by the passage of the wire through the smooth aperture of the second cutting device, the shavings from this, as well as from the previous operation, being collected, as they fall, in a suitable receptacle. If desired, the wire thus emerging with an unscored surface, may be wound up on the second reel without further reduction, or the third shaping device may be used to produce the same result on the reduced wire as the first device and, if practicable, other alternating shaping and cutting devices, gradually decreasing in diameter toward the end of the draft, may be employed.

After all the wire from the supply reel has been wound up on the receiving reel, the cutting and shaping devices in the several holders are removed, the holders being reversed to make their apertures face in the opposite direction and a new series of alternating shaping and cutting devices are inserted and held in the recesses of the holders by screws. These new wire reducing devices are substantially as those already shown, except that their alternating plain and toothed apertures are smaller in diameter. The wire on the right hand reel is then threaded through the apertures and between the adjusting cylinders, to be wound up on the left hand reel, the direction of the motor belt being reversed for this operation. Successive reductions of the wire in this fashion, each with the production of shavings of requisite fineness, are carried out until the diameter of the wire is so much reduced that no further reduction is practicable, and then the wire, removed from the reels, constitutes itself a salable product.

Steel Wool and Shavings

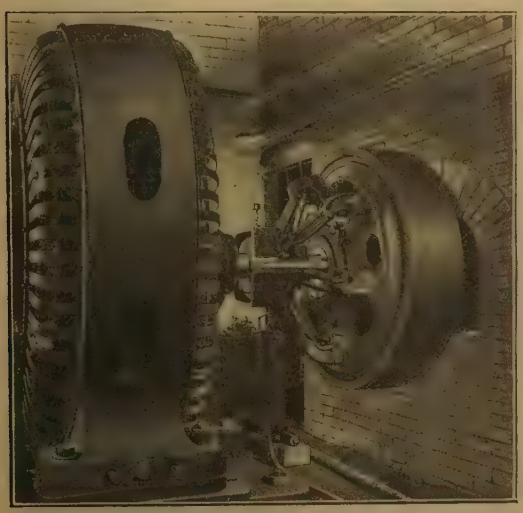
Steel wool consists of long steel fibers resembling curled hair. The fibers are of triangular cross section, and are graded according to fineness from coarse shavings to wool. Steel wool is used as an abrasive, and is a substitute for sandpaper and emery cloth or pumice stone, being regarded as superior to them for certain purposes. It is used in shipbuilding, in other building, in factories and in the household. No accurate figures of production are available. In 1917 the yearly consumption was estimated at between 1,000,000 and 1,500,000 lb., which (imports being cut off) virtually represented domestic production. Germany and Switzerland are also producers.

To help solve the country's problems of water supply and flood control, leaders of American engineering are urging Congress to establish a national hydraulic laboratory. Dean Mortimer E. Cooley, University of Michigan and president of the American Engineering Council, and John R. Freeman, president of the American Society of Civil Engineers, will advocate the laboratory proposal before a sub-committee of the Senate committee on commerce the latter part of this month.

Improves Clutch for Heavy Work

The Universal Giant friction floating disk-type clutch of the T. B. Wood's Sons Co., Chambersburg, Pa., has been improved to withstand severe shocks, such as in picking up a machine or a battery of machines under full load after the prime mover has been brought up to speed.

The disks and plates of the clutch are of iron, and hard wood blocks are fitted in the former so that the two end grain surfaces come in contact with the latter. The improvement consists of the use of a new friction lining on the clutch disks, instead of the wood blocks used formerly. The new lining is known as "non-burn," and is said not to burn out and to wear considerably longer than anything used heretofore for the purpose.



Heavy Duty Double Disk Clutch Between Motor and Main Line Shaft. The wearing qualities of the new friction lining on clutch disks is a feature

The clutch may be used in connection with standard pulleys, gears or rope sheaves, by boring them to fit the clutch sleeve. It may also be used to connect two shafts, a motor and a machine or an engine and the main line shaft, or bolted directly to machines.

The No. 36 double-disk type clutch is shown in the illustration direct connected between a synchronous motor and main line shaft. The motor is brought up to full speed of 200 r.p.m. and the clutch gradually thrown into engagement, picking up a starting load of 700 to 800 hp. without reducing the speed of the motor. It is claimed that in the case of this installation only one slight adjustment on the adjusting bolts has been necessary in 18 months.

Sizes ranging from 5½ to 480 hp. at 100 r.p.m. are available, the clutch having one, two or three friction disks as required.

Effects of Strike in Ohio

SPRINGFIELD, Ohio, Sept. 4—Bauer Brothers Co. is feeling the effects of the general uncertain situation. Orders have been slowing up for the past week. The company has only about thirty days' supply of coal for its foundry. The main plant is operated with power from the power house of the Springfield Light, Heat & Power Co. The Bauer Brothers Co. started recently running full time. Mr. Bauer says the outlook is encouraging if the strikes are settled.

President P. E. Montanus, Springfield Machine Tool Co., reports that the railroad companies will be in the market for tools as soon as the strike is ended, but at present the machine tool business is quiet. The Springfield plant is working only a limited force of men.

There has been a slump in orders at the plant of the Superior Gas Engine Co. during the last 10 days. This is probably due to the rail strike and the inability of companies to get material.

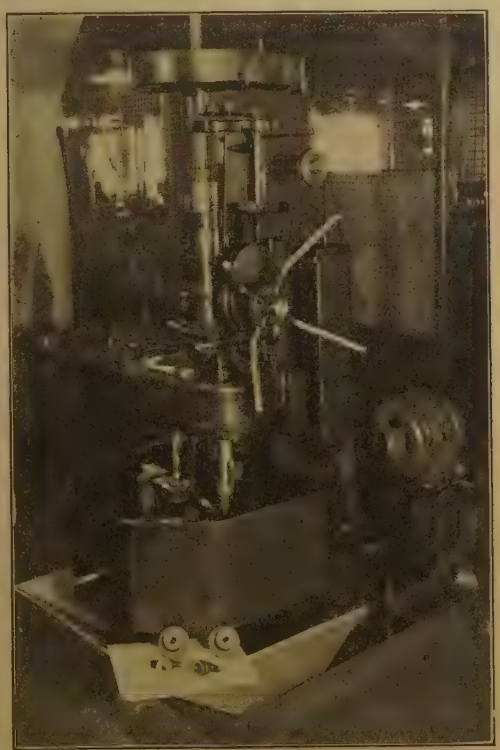
At the plant of James Leffel & Co. orders are coming in for water power equipment from various parts of the country.

Drill Arranged for High Production

The illustration shows a 20-in. box-column drilling machine of the Rockford Drilling Machine Co., Rockford, Ill., arranged to rough drill, rough taper ream and face and finish taper ream the yoke and flange members of a new oil-lubricated universal joint. A production of 250 of these pieces in a 10-hr. day is said to be obtained by the Mechanics Machine Co., Rockford, Ill.

In this arrangement a four-station rotary table, with the index plunger worked by a foot treadle, is applied to the regular table. The rotary table is indexed by hand after the locating plunger is pulled. Four two-jaw chucks with formed jaws to suit the work are provided for the table, an extended wrench being used for tightening the chuck screws, which takes place outside of the chip guard. The chucks are under the work spindles, three of them being in operation while the fourth is being loaded. A finished piece is removed at each index.

A three-spindle drive head equipped with a V-gibbed slide is mounted on the table ways as shown. The machine spindle serves to drive and feed this head, which is fully counterweighted. A positive micrometer adjustment stop on the quill is provided for a depth gage. An adjustment for height and diameter of drill, drill-bushings support is provided under the left-hand spindle.



Drilling Machine Equipped with Four-Station Rotary Table and Three-Spindle Drive Head, Mounted as Shown

The machine is regularly rated as having a capacity to drive a 2-in. high-speed drill in solid steel. The drive is direct by silent chain from an electric motor through interchangeable pick-off gears for speed changes. Four feed changes are regularly provided in a simple feed box. The diameter of the rough-drilled hole in the yoke and flange members shown is ¾ in. and the length 2⅝ in.

ACTIVITY IN METAL TRADES

Worcester, Mass., Operations Typical of Betterment in New England

WORCESTER, Mass., Sept. 2.—Metal and kindred industries of Worcester and of Central Massachusetts generally have been working back to normal ever since the beginning of the year, and in some lines have reached that point. The wire mills are running full, the only limit being the supply of labor. The manufacturers of screw machine products are driving their machinery to the limit. The pressed and stamped metal plants are fairly busy, but there is a question as to raw material supply. The Osgood-Bradley Car Co. is pretty well filled up, a recent $2,000,000 order being for steel passenger cars for the Boston & Maine Railroad. The car shops at the Summit have been employing 1500 men and the number is being increased.

The screw business, as represented here by the large works of the Reed & Prince Mfg. Co., operating on a 60 per cent basis, is neither good nor bad, but is much better than at any time since the slump. The textile machinery industry as represented in Worcester was hit less than most in that line.

Machine Tools an Exception

The one exception to the general report is the machine tool industry, especially firms building the older standard types such as lathes, planers, milling machines, drilling machines and shapers. Concerns such as the Reed-Prentice Co. and the Woodward & Powell Planer Co. report a certain degree of improvement, but by no means a large one. The grinding machine situation is markedly better, however.

The sum total of improvement in the machinery industry, according to a past president of the National Machine Tool Builders' Association, is represented by the average percentage gathered by the association from its members. In 1920 these firms, representing a large part of the industry, furnished the association with their average monthly sales in dollars for the first quarter of the year. Ever since that time, the same firms have submitted monthly reports, in percentage of that monthly average. In 1921 the returns indicated only 8 per cent of the basic month, in a few cases running up to ten per cent. Since the beginning of 1922 there has been an increase, until July gave twenty-five per cent. That is to say, the machine tool business of the United States as represented by sales of new equipment was one quarter of what it was early in 1920. The correction should be made, however, that reduced prices, probably averaging upward of twenty-five per cent, have made a larger volume of actual business necessary to secure a given total in dollars. Consequently, at the 1920 prices the business for July would be considerably greater than the twenty-five per cent.

The machine tool shops of this section are operating with very small forces indeed, as a rule, because when the depression fell upon them they had large inventories. A planer builder, for example, reports that to fill an order for any standard size machine in his line he has only to order in a bed and table, the rest of the machine being ready at hand in stock, ready for assembling.

The Norton Co., manufacturer of abrasive wheels and grinding machines, is increasing production rapidly in both wheel and machine divisions. The big plant six, which was added during the war and operated up to the time of the depression, has been started up again, which, together with normal production in other units of the wheel division, has meant a large increase in working force, operating on full schedule. The machinery division was even flatter than the rest of the works until early this year, when orders began to come in, and now operations have so increased as to mean the employment of 400 hands in the machine shops. The orders for machinery not only include the automobile industry, but industrial activities generally. Preparations are now making to manufacture grinding machines for stock. The company had a considerable inventory to carry over, but this has largely disappeared, and since the dull times set in several new types have been added to the line and will now figure in stock production.

The manufacturers of abrasive wheels have felt in a very serious way the great stocks of wheels in the factories of their customers, notably in the automobile industry. These cared for all requirements, with occasional exceptions, for months after manufacturing resumed an active form. Now, the wheel makers have learned, the accumulation of wheels is down close to normal proportions and buying has increased.

The Heald Machine Co. is moderately busy. This company bridged the dull times by specializing on a line of garage machines, but the demand is now including standard lines.

The Graton & Knight Mfg. Co. finds a material demand for export figuring in its increase in leather belting business. But exports to Europe are not in large volume, South America and the Far East figuring more importantly.

The Baldwin Chain & Mfg. Co. specializes on chain drives for a diversity of uses which are increasing constantly. At present some 400 names are on the payroll, a large increase since the year began. Some of the new demand is from the tractor trade, but the larger part is from machinery builders producing a great variety of equipment, chiefly automatic.

Screw Machine Operators Scarce

The screw machine situation is complicated by a scarcity of operators. The Parker & Harper Co. is running full force overtime; the Liberty Screw Co. is operating day and night, and the Walden-Worcester, Inc., which does a large general business in screw machine products, is operating that department twenty-four hours a day. Incidentally this company, now operating under the management of J. Verner Critchley, in August had a record month in the manufacture of its wrenches.

Employers are beginning to bid for screw machine operators. The Worcester rate is sixty and sixty-five cents an hour. Local managements report that agents of Connecticut factories have offered seventy-five cents an hour and upward, and the result has been a mild but annoying exodus.

Wire Works Well Employed

The wire industry of Worcester is prosperous. The coal and railroad strikes have had little effect up to the present time, as the necessary fuel and raw materials were on hand in quantity when the trouble began. The Worcester works of the American Steel & Wire Co. buy large quantities of power from the New England Power Co., which has exceptional reserve waters on the Connecticut River and its tributaries, this wet season, and the Wickwire-Spencer Steel Corporation depends wholly upon the Worcester Electric Light Co. which has fuel to last for months.

The one great trouble is labor. The American Steel & Wire Co. has been handicapped in this respect, but the announced advance in wages should help to some extent, and with the coming of cold weather large numbers of men will be released from outdoor employment, which has been much greater than usual this year.

In the effort to secure workers, agents have met incoming steamers in Boston. But they found immigrants of the brawn and muscle type in very small percentage, in sharp contrast to former experience.

The Worcester Wire Works, Inc., one of the young wire concerns, which makes high carbon steel wires, has been busy for months, its product going chiefly to the automobile factories, and to the wire rope manufacturers, particularly of the Pacific Coast, to be fashioned into rope for logging and mining operations. There is a stiffening of prices, due to the growing cost of raw material.

Improvement in the wire specialty business is shown in the experience of Sleeper & Hartley, Inc., manufacturers of special wire forming machinery. Not many months ago the large shop was practically idle. To-day it is operating on nearly a normal basis, with orders for many different customers. In this the

management shares the experience of the many special machinery builders of New England.

The pressed and stamped metal companies are beginning to worry over their raw material supply, for the steel mills are not shipping in required quantities. The industry in Worcester is otherwise very well off. The Worcester Pressed Steel Co., largest of the local concerns, is running its plant as full as in the high tide of production, but, with the exception of some of the mills of the cold rolled strip department, there are no night shifts. Most of the orders are from the New England territory, both in metal products and in strip. Orders average small, but there are many of them. The Boston Pressed Metal Co. is equally busy, its trade being divided between the East and the Middle West. The Worcester Stamped Metal Co. and other concerns in this line of business are operating at a good rate.

Toolholder and Interchangeable Cutters

Toolholders and cutters, constructed as shown in the illustration, are being offered by the Morris Tool Co., 7 Beekman Street, New York. They are for use on lathes, planers, shapers, boring mills and slotters, and are intended to permit the most economical use of high-speed steel, furnishing, it is claimed, unusually rigid support for the cutter point and maximum heat transference.

The cutter blade is double, as shown, either cutting edge being used until worn out, without affecting the other. They are secured to the chrome-nickel steel holder by two heat treated steel bolts. The holder is made with straight and offset shanks, and being reversible, one offset shank provides for both right-hand and left-hand positions. The cutters are interchangeable for either position and may be used until practically ground down to nothing at the cutting point. A unique feature is the vertical offset of the cutter-holding bolts with respect to the holder center line, which provides for adjusting the point to the proper height as it wears down. The clamp system is pointed out as being not only simple and efficient, but very well fitted to hold the cutters without breaking them.

Toolholder and Interchangeable Cutters. The holder is made with straight and offset shanks. Unusually rigid support for cutter point is emphasized

A complete working set of tools consists of one each straight, right-offset and left-offset toolholders, three left-hand and three right-hand roughing tools; two 60-deg. U. S. S. or V-thread tools; two cut-off tools, and one right-hand and one left-hand side tools. There are 10 sizes, from the No. 3 with a ½ x ¾ by 5¼-in. holder, blade ¼ in. thick, to the No. 17 with 2½ by 3 by 24-in. holder, blade 1⅛ in. thick. Complete sets are made up to size No. 11.

It is claimed that in a test the No. 11 roughing tool, with standard tool blade and 7/16 in. depth of cut with ⅛-in. feed, traversed 1 mile, 4270 ft., 5½ in. in three 21-in. torpedo flasks without re-grinding.

Using Mexican Coke Exclusively

The blast furnace of the Compañia Fundidora de Fierro y Acero de Monterey, S. A., (Monterey Iron & Steel Co.) Monterey, N. L., Mexico, which was blown in on July 24, is being operated entirely on Mexican coke. This is the first successful operation with the exclusive use of domestic coke. The furnace products are basic, foundry and high manganese irons.

To Make Knobbled Charcoal Iron Sheets and Roofing Ternes

The Charcoal Iron Products Co., organized a few months ago to take over the plant of the Griffiths Charcoal Iron Mills, Wylie Avenue, Washington, Pa., has practically completed the rehabilitation of the old plant and expects to start operations about Oct. 1.

Eight knobbling furnaces of an improved type have been installed; also a new heating furnace while an old one has been rebuilt. Both of the heating furnaces are served by waste heat boilers. The bar mill, the steam-hammer and the rolling mills have been renewed and the company also is changing the pickling machine so that it can be used for either large or small pieces. Formerly the pickling machine could be used only for 20-in. x 28-in. sheets. Furnaces for serving the two hot mills are new installations. The sheet mill building is served with a new type of monorail hoist which runs out into the loading yard over the tracks of the Pennsylvania Railroad, a branch of which runs alongside the plant.

The company will make knobbled charcoal iron sheets and heavy coated roofing ternes and later will go in for the manufactured products, as it has the facilities for making conductor pipe and eave troughs and also corrugating and roll roofing machines.

John Slater is president, George N. Wolf, vice-president; Ray G. Zelt, treasurer; E. T. McNulty, secretary and general manager, and H. M. Wade, superintendent. Mr. McNulty formerly was superintendent of the Yorkville, Ohio, works of the Wheeling Steel Corporation and Mr. Wade also was connected with that plant before making his present affiliation.

American Iron and Steel Exports to Brazil

WASHINGTON, Sept. 5.—Prospects are good for the sale of American iron and steel in Brazil, but orders are being held up on account of the uncertainty of delivery due to the coal and rail strikes, according to a cable dispatch received by the Department of Commerce from Commercial Attache Schurz, Rio de Janeiro. The State of Rio Grande do Sul will receive bids for 300 kilometers of 65-lb. rails on Sept. 10, and for 90 kilometers on Sept. 23. The Great Western of Brazil Railroad will also order about 6000 tons of rails in September.

From July 21 to Aug. 20 imports at Rio de Janeiro and Santos included the following: Wire, over 2098 tons from the United States; steel bars, 386 tons from the United States, and heavy shipments from England; sheets, 1382 tons from the United States and considerable shipments from England; miscellaneous iron and steel products, over 1000 tons from the United States and considerable shipments from England, Germany and Belgium; tin plate, 510 tons from the United States.

A cable from Cuba states that August produced no marked changes in the iron and steel market there. Practically no business of importance is being transacted in sugar mill machinery owing to the policy of economy being followed.

The principal iron and steel works of Mexico, located in the city of Monterey, a report states, anticipates new workings in its iron deposits in the State of Durango, due to the prospective demand for manufactured products by the mining industry.

Tablet to Commemorate First Production of Bessemer Steel in America

Probably one of the most interesting events to occur during the international steel exposition and convention of the American Society for Steel Treating at Detroit, Oct. 2 to 7, will be the unveiling of a bronze tablet dedicated to the memory of those pioneers of the steel industry who in 1864, at Wyandotte, Mich., erected the first Bessemer steel converter used commercially for the manufacture of Bessemer steel in America. This tablet is to be erected by the Detroit chapter of the American Society for Steel Treating through its executive committee and Messrs. Atkinson, Hamilton and McCloud, acting as a special committee.

The site of the Wyandotte Iron Works where Kelly's first tilting Bessemer steel converter was erected is the present location of the Wyandotte public library, and permission has been secured from the library board for the placing of this tablet on the front of the building. It will be 24 x 36 in. and at the head of it will be a bas relief of the original converter.

The unveiling exercises will probably be held on Thursday afternoon, Oct. 5, and the Governor of Michigan has indicated his intentions of being present, and other speakers of prominence are being invited.

The erection of this tablet is the first public recognition of the achievements of William Kelly who made his first Bessemer steel in 1847 and finally patented his process in 1856, although it was eight years later before the Wyandotte Iron Works produced the first Bessemer steel for commercial purposes. Shortly before Mr. Kelly's death, he said to his children, "The day will come when some one will do me justice." It remained for the Detroit chapter of the American Society for Steel Treating to commemorate the achievement of the early pioneers in the development of the process that caused the United States to become the supreme steel-making nation in the world.

Dinner to Harold L. Stevens

Some twenty-odd Boston iron and steel representatives gave an informal dinner Thursday evening, Aug. 31, at the Algonquin Club, that city, in honor of Harold L. Stevens, who recently resigned as New England sales manager, Lackawanna Steel Co., to become general sales manager Central Iron & Steel Co., Harrisburg, Pa. Among those present were: W. S. Locke, Carnegie Steel Co.; C. N. Fitts and W. B. Douglas, New England Structural Co.; H. O. Russ; R. B. Sanderson, E. P. Sanderson Co.; C. A. Beale, Alan Wood Iron & Steel Co.; J. G. Andrews and M. F. Brown, Boston Bridge Works; A. C. Harvey, A. C. Harvey & Co.; W. H. Hayes and C. H. Carter, Midvale Steel & Ordnance Co.; H. G. Porch, Lukens Steel Co.; H. G. Austin, Central Iron & Steel Co.; S. Wiley Wakeman, Fore River Works, Bethlehem Shipbuilding Corporation, Ltd.; George Dennyven; Frank Sargent, Chicago Pneumatic Tool Co.; R. B. Wallace and Frank Brigham, Bethlehem Steel Co.; and W. E. Clark.

Mr. Austin served as toastmaster. Mr. Hayes spoke in behalf of those present and those unable to attend, wishing Mr. Stevens success in the new field. Mr. Fitts and Mr. Carter were in charge of arrangements.

The Basset Process

Speaking at the annual meeting of the Ougrée-Marihaye Co., Belgium, Gustave Trasenster, chairman, mentioned the Basset process, which, he said, had already yielded satisfactory results, according to the London *Iron and Coal Trades Review*. The production of a high temperature in a reducing atmosphere, which is the basis of this new process, represented indisputable progress. The intentions of the directors had been to follow very closely the trials which were being continued, and to secure for the company the exclusive patent rights for Belgium, Luxemburg, and a portion of France. Under these circumstances the company had considered it advisable to participate in the French company to the extent of 1,000,000 f. Among other results obtained with the new process, the speaker said that it had been possible to abstract the metal from the ore, leaving only 1 per cent of iron in the slag. Certainly the lining of the furnace was not yet what it ought to be.

Henry Marion Howe Medal Founded by Steel Treaters

The Board of Directors of the American Society for Steel Treating, with the approval of Mrs. Howe, has set aside a fund from the treasury of the Society to be known as the Henry Marion Howe Fund, the proceeds from which will apply on an annual medal to be known as the Henry Marion Howe Medal.

The medal will be of gold and will be presented to the author of the paper considered of highest merit on any subject within the field covered by the Society.

The establishment of this medal is as a tribute to the exceptional contributions made by the late Doctor Howe to the science of metallurgy, and in this way the society will commemorate annually the career of its distinguished honorary member.

The rules governing the award of the medal will be announced during the international steel exposition and convention of the American Society for Steel Treating at Detroit, Oct. 2 to 7.

Meeting Committee A-1 of American Society for Testing Materials

F. M. Waring of the Pennsylvania Railroad Co., Altoona, Pa., chairman of committee A-1 on steel of the American Society for Testing Materials, has issued a call for a meeting of his full committee to be held at Detroit, Oct. 5 and 6, during the international steel exposition and convention of the American Society for Steel Treating. The following meetings are scheduled for October 5: 10:00 a. m., sub-committee II; 11:00 a. m., sub-committee XIV; 12:00 noon, sub-committee VIII; 2:00 p.m., sub-committee XIX.

On Friday Oct. 6: 10:00 a. m., advisory committee of committee A-1; 11:00 a. m., important session for purpose of effecting an organization for coming year besides discussion of the work before the committees and the hearing of committee reports.

All of the meetings will be held at Hotel Statler, and practically all of the 134 members are expected to be present.

Meeting of Drop Forge Supply Association

H. N. Taylor, president, N. & G. Taylor Co., and president for the past eight years of the Drop Forge Supply Association, has made arrangements for the holding of a meeting of the members of his association during the international steel exposition and conventions of the American Society for Steel Treating and the American Drop Forging Institute in Detroit. The meeting will be held at 12:30 on Tuesday, Oct. 3, in the General Motors Building.

Engineers Elected to Eye-Sight Council

Election of several engineers and educators to the board of councillors of the Eye-Sight Conservation Council of America is announced from the headquarters of the Council in New York. Engineers chosen include Prof. Joseph E. Roe, head of the department of industrial engineering, New York University, and Dr. F. C. Caldwell, professor of electrical engineering, Ohio State University.

Professor Roe is a member of the executive board of the American Engineering Council of the Federated American Engineering Societies and president of the Society of Industrial Engineers. Professor Caldwell is chairman of the committee on education of the Illuminating Engineering Society. Further enlistment of the co-operation of the engineering profession is being planned by the Council.

Trade Commission Objects to Merger

Complaint Filed Against Republic, Midvale and Inland Steel Companies Conflicts with Position of Department of Justice—Plans for Combining Will Proceed

BY L. W. MOFFETT

WASHINGTON, Sept. 5.—Issuance last Thursday by the Federal Trade Commission of a complaint against the Midvale Steel & Ordnance Co., the Republic Iron & Steel Co., and the Inland Steel Co., charging that the proposed merger of these interests is an unfair method of competition in violation of Section 5 of the Federal Trade Commission act, was expected, but at the same time it created an anomalous position as between the commission and the Department of Justice. The department, in its report to the Senate on July 21, gave its emphatic approval to the proposed mergers of the Bethlehem Steel Co. and the Lackawanna Steel Co., as well as of the three companies against which the commission has just issued a complaint, after it had taken similar action with regard to the Bethlehem and Lackawanna companies. While it is true that the report of Attorney General Daugherty was confined from a point of jurisdiction to the Sherman, Clayton and Webb-Pomerene acts, and the Federal Trade Commission is proceeding under the Federal Trade Commission act, the Department of Justice, in the course of commenting on the proposed merger of the Midvale, Republic and Inland companies (to be known as the North American Steel Corporation) said that there is but one underlying purpose in the combination; that is, to enable the new company to compete with the United States Steel Corporation. It was added: "Instead, therefore, of being in restraint of trade the new combination will be in furtherance of trade." A similarly clean bill was given by the Department to the Bethlehem-Lackawanna merger, and Samuel Untermyer, in one of his attacks on the Steel Corporation, said he could see no violation of law in the mergers.

But the Federal Trade Commission, with a sharp dissent from its newest member, Judge Vernon W. Van Fleet, only followed its own precedent and did the expected in issuing the complaint. Chairman Gaskill, in explaining his attitude in a somewhat elaborate legalistic disquisition, and asserting the views are his own and not necessarily those of the commission, seeks to justify the complaint on a matter of public policy. Judge Van Fleet directly challenges this view and supports that of the Department of Justice, with which Mr. Van Fleet was formerly associated, and expresses the opinion that the merger is in the public interest. Lawyers who have studied the documents of Chairman Gaskill and Commissioner Van Fleet, both of whom are admittedly able attorneys, have expressed the view that the latter in this case expresses much the sounder law.

The statement of Commissioner Van Fleet, tart in its tone at different points, speaking of the United States Steel Corporation as the chief competitor of the respondents, says the former controls about 45 per cent of the steel business of the country, as against a possible 7½ per cent of the Midvale, Republic and Inland companies. He adds: "We seek to prevent this small combined competition. We strain at the gnat and swallow the camel." This observation is made after reference to the fact that the United States Supreme Court held that the Steel Corporation did not violate the Sherman act.

In view of the sharp difference of opinion between the majority members of the commission and the Department of Justice, it is interesting to consider the possible course of the proceedings. Should they reach the Supreme Court, jurisdiction before that tribunal on the part of the Government would rest with the Department of Justice. The Solicitor General of the department, acting under the Attorney General, can assign any attorneys he sees fit. While it is conceivable that he might defer to the Trade Commission and select counsel from that body, he could select counsel from the department, which has approved of the proposed mergers so far as the Sherman, Clayton and Webb-Pomerene acts are concerned. Going further, the department, taking a view directly opposite to that of the commission, said they would be in the public interest, or favor "public policy."

The commission announced that the Midvale, Republic and Inland companies are given 30 days within which to file answers. In the formal complaint it is stated that Oct. 20 has been fixed as the date when a hearing will be had on the complaint so that the respondents may "show cause why an order should not be entered by said commission requiring you to cease and desist from the violation of the law charged in this complaint."

Merger Plans Will Proceed

Thomas L. Chadbourne, of the law firm of Chadbourne, Babbitt & Wallace, who was one of the chief figures in the negotiations that brought the steel companies into agreement last spring, makes the following statement:

"Inasmuch as the Attorney General has reported favorably on the proposed merger, and all of the eminent counsel whose opinion has been sought have approved the project as entirely legal, the three interested concerns have authorized me to announce that they intend to proceed with the necessary steps to make the project effective."

In their decision the three companies are following the precedent set by the Bethlehem Steel Corporation and the Lackawanna Steel Co., which after receiving a clean bill of health from the Attorney General are proceeding to consummate the merger of those two companies.

Commissioner Van Fleet's Reasons

Commissioner Van Fleet in voting against the issue of the complaint, filed the following memorandum setting out the reasons for his dissent.

In the matter of Midvale Steel & Ordnance Co., Republic Iron & Steel Co., and Inland Steel Co.

In this case the salient facts are that one corporation competitor of the respondents controls about 45 per cent of the steel business of the country; that the proposed merger if consummated would control about 7½ per cent of such business and the other so-called independents would control about 47½ per cent of such business; that the proposed merger is to be accomplished by the acquisition of the physical assets of the constituent corporations and not by the acquisition of

their shares or share capital. The plants of respondents are widely separated, being in Pennsylvania, Ohio and Indiana. It is true that there is some competition between them as there is between them and their chief competitor and between them and all other independents. It is, of course, true that the proposed merger would do away with competition between the merging companies. This must be the case in all mergers of competing companies. It is plain under the decisions of the Supreme Court of the United States, which decisions have now become so well known that it is unnecessary to cite them, that it is not every lessening of competition that is against the Sherman law, but only that which is in unreasonable restraint of trade and in the case of the United States vs. the United States Steel Corporation, a combination controlling a very much larger proportion of the steel business, was held not to be in unreasonable restraint of trade nor a monopoly. If this is so—and it is the law of the land as long as such decision stands—it cannot well be argued that the proposed merger is against such law. Indeed, I do not understand that it is contended that the proposed merger in within the inhibition of the Sherman law as interpreted by the Supreme Court. My personal idea is that the decisions of that court are of binding effect upon us. The Clayton act provides that "no corporation engaged in commerce shall acquire, directly or indirectly, the whole or any part of the stock or other share capital of another corporation engaged also in commerce, where the effect of such acquisition may be to substantially lessen competition between the corporation whose stock is so acquired and the corporation making the acquisition, or to restrain such commerce in any section or community, or tend to create a monopoly of any line of commerce."

Far-Reaching Act

It will be seen that this act is much more far-reaching than the Sherman act in cases coming within its provisions for the reason that it prohibits substantial lessening of competition between the corporations themselves, and if its language were broad enough to include every combination however effected, it would prohibit all combinations of competing businesses.

In such case and under such construction, the Sherman act would become obsolete. There would be no need ever to resort to it because always the combination, though it did not contravene its provisions, would come within the provisions of the Clayton act. So the Clayton act specifically limits its operation to a case where the combination is effected by the acquisition of shares or share capital, thus under the well known maxim of statutory construction "expressio unius," etc., excluding its application to any other state of facts. Thus it seems plain that the proposed merger does not come within the inhibition of either the Sherman act or the Clayton act. The Attorney General in an opinion, recently rendered to the Senate of the United States, in a response to a resolution, has held that the proposed combination is not in violation of either of these acts. While such opinion is not of binding effect on this commission, I think it is sound and entitled to great weight. But it is argued that the proposed merger comes within the Federal Trade Commission act as a method of unfair competition because said act prohibits all methods which are against public policy and it is argued that the proposed merger is against public policy as declared in the Clayton act. I concede that all methods of competition which are against public policy are to be deemed unfair and within the act.

Lessening Competition

It is contended because the Clayton act prohibits mergers which substantially lessen competition between the merging companies, under certain conditions, that this is a declaration of public policy to prevent such mergers under all conditions. In other words, we are to reach down into the Clayton act and take a part therefrom and supplementing it with the Federal Trade Commission act, make that unlawful which is not declared to be unlawful by the act itself. It is contended that such a merger is against public policy. Who says so? Congress did not say so. It said that such merger should be unlawful only when accomplished by the acquisition of shares or share capital. If its intent had been to make it against public policy to combine in any other manner, it would have said so. It might have used the words "capital assets" or "by any means," or "in any other manner," but it did not.

It seems to remain for the Federal Trade Commission to do this, thus making the inhibition of the act apply to a state of facts not enacted by Congress. Thus adding to the law provisions Congress did not make. Thus making that unlawful Congress did not make unlawful. Thus in plain terms judicially legislating. There was a well defined purpose in the Clayton act, namely, to prevent secret combinations by the acquisition of stock and a reference to the debate over the bill clearly demonstrates this and clearly shows it did not have in mind the prohibition of the merging of competing companies under all circumstances. I do not think any support for this theory can be obtained from the Beechnut case. The argument is that in that case, although there was no violation of the Sherman act in terms because no contract in restraint of trade, yet the court held the acts unlawful which were in violation of the terms of that act as against public policy. But the acts inhibited by the Sherman act are and for hundreds of years have been unlawful at common law. Acts in unreasonable restraint of trade and tending to create monopoly have always been against the common law and consequently against public policy, so that this public policy exists although the terms of the Sherman act are not violated.

A Different Case

But the case of the Clayton act is different. It has never been per se unlawful, nor against the common law for two or more competing businesses to combine, thus substantially lessening competition between them. In and of itself without more such a combination has always been legal. It is only when it goes further and results in unreasonable restraint of trade or tends to create a monopoly that it becomes unlawful unless it also comes within all the terms of the Clayton act. The mere fact of the elimination of competition between merging corporations never having heretofore been illegal, it cannot be made illegal by the mere fiat of the Federal Trade Commission. As said by the Supreme Court in the Gratz case: "The words unfair methods of competition . . . . are clearly inapplicable to practices never heretofore regarded as opposed to good morals because characterized by deception, bad faith, fraud or oppression, or as against public policy because of their dangerous tendency unduly to hinder competition or create monopoly."

The usual method of procedure has been somewhat varied in this case in that a full hearing was given prior to the issuance of a complaint.

Would Prevent Economies

What I deem to be a full disclosure of the facts has been made with a thorough presentation of the law. It appears that the chief competitor of the respondents is the United States Steel Corporation controlling about 45 per cent of the steel business of the country as against a possible 7½ per cent of the combined respondents. This great corporation is reputed to be probably the most efficiently managed business concern in the world. It has vast power, albeit wisely administered.

It can produce a ton of steel at from $3 to $5 a ton cheaper than its competitors. It would seem that the so-called independents exist by its wise tolerance. It evidently dominates the trade. Yet in such a condition of affairs, we seek to prevent this comparatively insignificant combination, whose object plainly is to effect economies. That such a combination could if it wished restrain trade or create a monopoly is out of the question. The one does exist. We seek to prevent this

small combined competition. We strain at the gnat and swallow the camel.

For the foregoing reasons, I dissent from the action taken by the majority in this case.

VERNON W. VAN FLEET,
Commissioner.

Commissioner Gaskill's Statement

Commissioner Gaskill filed the following memorandum expressing the reasons underlying his vote to issue the complaint:

In the matter of Midvale Steel & Ordnance Co., Republic Iron & Steel Co., and Inland Steel Co.

The Federal Trade Commission, having reason to believe that the pending proceedings of Midvale Steel & Ordnance Co., Republic Iron & Steel Co., and Inland Steel Co., looking to a combination or merger, are in violation of law, and that action by the commission in respect thereof is in the public interest, has issued a complaint against these three companies stating its charges in that regard. In ordinary circumstances, I should consider that an expression of the reasons underlying my vote for such action would be premature lest it be mistakenly accepted as a binding declaration controlling my final judgment. Such a statement more properly accompanies the commission's decision at the conclusion of a case.

But the circumstances are peculiar. The case, like that of the complaint against the Bethlehem-Lackawanna combination, is of paramount importance to the parties involved and to the public. The Attorney General of the United States, in a careful and learned opinion, has advised the Senate of the United States that the companies involved are not acting in violation of the Sherman law. With due deference to the jurisdiction of the Federal Trade Commission, the Attorney General refrains from any expression of opinion as to the application of the Federal Trade Commission act. Nevertheless, the distinction is not clear to the general public, nor yet to the whole of the legal fraternity.

Views Differ Widely

The views which I entertain as to the state of the law applicable in this instance apparently differ widely from those which are held by counsel for the several respondents since neither their briefs which were submitted to the commission nor their arguments in conference, were directed along these lines. It seems proper therefore that I should state my view of the applicable law in order that counsel may be fully informed and may direct the case upon the complaint in such manner that the commission will receive the full benefit of their consideration of the possible aspect of the law, which is now suggested.

The Sherman law is both a declaration that restraint of trade and monopoly are contrary to public policy and a prohibition of the use of certain specified methods of accomplishing either of the unlawful objects. This definition of unlawful methods is a limitation upon the scope of that law. And so in a great body of decisions upon the Sherman law, the judicial function is concerned with the question of method rather than object, to determine whether the method under examination is within the limitations created by the legislative definitions.

Under the Federal Trade Commission act, on the contrary, the question is solely related to the nature or character of the object. If that is unlawful, it matters not what the method used to accomplish it may be. This is the great and controlling distinction between the two laws.

The Federal Trade Act

Section 5 of the Federal Trade Commission act reads in its significant part as follows: "Unfair methods of competition in commerce are hereby declared unlawful * * * The commission is hereby empowered and directed to prevent persons, partnerships, or corporations, except banks, and common carriers, subject to the acts to regulate commerce, from using unfair methods of competition." In this all inclusive declaration is condemnation of all and every method of establishing unfair competition. There is no limitation created by legislative definition as there is in the Sherman law. Congress declined the attempt to define unfair competition, or to specify the methods which are to be prohibited. It placed this duty of interpretive definition upon the commission subject to review by the courts. The commission as an administrative body must determine in the first instance whether a given action is an unfair method of competition and upon review the court determines not whether it would have reached the same conclusion had it been sitting in place of the commission, but whether the commission was permitted under the law to reach the conclusion which it stated.

There was no need for any other form of legislation. As Mr. Justice Brandeis stated in his dissenting opinion in the Gratz case, "What Section 5 declares unlawful is not unfair competition. That had been unlawful before. What that section made unlawful were 'unfair methods of competition'; that is, the method or means by which an unlawful end might be accomplished."

What is the unlawful end, object, under the Federal Trade Commission act which may not be accomplished by any method?

Unfair Methods Defined

Explaining the phrase "unfair methods of competition," Mr. Justice McReynolds speaking for the majority of the Supreme Court in the Gratz case, said:

"The words 'unfair methods of competition' are not defined by the statute and their exact meaning is in dispute. . . . They are clearly inapplicable to practices never heretofore regarded as opposed to good morals because characterized by deception, bad faith, fraud or oppression, or as against public policy because of their dangerous tendency unduly to hinder competition or create monopoly."

If we set aside as not bearing upon the question now under consideration, that part of this statement which refers to practices contrary to good morals, and cancel the double negatives so as to state the proposition in the affirmative, the rule laid down by the court for determining the nature or quality of the unlawful object prohibited by the Federal Trade Commission act is:

"The words 'unfair methods of competition' are applicable to practices heretofore regarded as against public policy because of their dangerous tendency unduly to hinder competition or create monopoly."

The word "heretofore" cannot be construed to limit the application of the act to specific prior definitions either in law or judicial decisions. It is merely recognition of the fact that public morals and public policy have heretofore been regarded as the standards of fair competition. To apply it literally and strictly is to make section 5 merely a confirmation of a series of judicial precedents. The act must include all methods which fall within the boundaries of public morals and public policy. And manifestly, it must at least be broad enough to include subsequent legislative declarations of public policy.

Section 5, in so far as it is now applicable, may then be stated thus, "Any method which is against public policy because of its dangerous tendency unduly to hinder competition, is unlawful."

Sherman Law Declaratory

The Sherman law is declaratory of public policy, coming within even the most limited view of the meaning of the word "heretofore." Therefore, whatever method is used to accomplish an object contrary to the public policy as declared in that act, may be "prevented" under the Federal Trade Commission act. Not as a violation of the Sherman law and for that reason an unfair method of competition, but being in contravention of public policy as declared in the Sherman law, it is an unfair method of competition under the Federal Trade Commission act.

In the Beechnut case, the commission avowedly put its complaint outside the Sherman act by stipulating

that there was no contract present in that case. The respondent practically argued that unless the Sherman law applied, the order of the commission should be reversed. The court said, "The Sherman act is not involved here except in so far as it shows a declaration of public policy to be considered in determining what are unfair methods of competition, which the Federal Trade Commission is empowered to condemn and suppress."

The Clayton law stands with reference to the Federal Trade Commission act in precisely the same relationship as the Sherman law. It is a declaration of public policy which is to be considered in determining unfair methods of competition.

That it was passed subsequent to the Federal Trade Commission act cannot foreclose the commission from looking to the Clayton act for declarations of public policy. Even if it had no power to enforce any of its specific provisions as it has no power to enforce the specific provisions of the Sherman law, what language of section 5, permitting the commission to accept the public policy of the Sherman act, precludes it from regarding the Clayton act in like manner?

Public Policy Involved

The Clayton law, like the Sherman law, is a declaration of public policy with definition of specific methods which are prohibited. But these definitions, while they are limitations upon the application of the act in which they appear, are not limitations upon the provisions of section 5 of the Federal Trade Commission act, nor do they define its scope. Because the act confers jurisdiction in part upon the commission, it may in a given case proceed to issue a complaint founded on the Clayton law. In which case, the facts charged and proven must conform with the specific definition of that act's prohibition. But if the public policy of that act is contravened by the use of a method not specifically outlined in the act, the invasion of the public policy may be prevented none the less, under the power of the commission to prevent the use of all unfair methods of competition. In such case the Supreme Court might well say of the Clayton law, as it said of the Sherman law in the Beechnut case, "The Clayton law is not involved here except in so far as it shows a declaration of public policy to be considered in determining what are unfair methods of competition, which the Federal Trade Commission is empowered to condemn and suppress."

Section 7 of the Clayton act prohibits the substantial lessening of competition between competing corporations or the restraint of trade in any section or community or the creation of monopoly of any line of commerce where any one of these conditions may be the effect of any direct or indirect acquisition of the whole or part of the stock or other share capital of one competitor by another or of two or more competitors by a third competitor.

Three Competing Companies

In the pending case it seems to be clear that each of the three companies is a competitor of the other two. It is apparent that by the consummation of the proceedings now under way all competition between them will cease. The contention is that the Clayton act has no application because the plan does not contemplate the acquisition of any "stock or other share capital," but will be carried out by a purchase of assets. In other words, the public policy declared in the Clayton law may be ignored and competition between competing corporations be entirely eliminated because it is not done by the specific method prohibited in that statute.

If it were not for the continuing application of section 5 of the Federal Trade Commission act to any method which contravenes public policy whenever and however properly declared, because of a dangerous tendency unduly to hinder competition, the argument might be sound. The Beechnut case probably could not have been prosecuted to a successful conclusion under the Sherman law because there was no contract, combination or conspiracy present. If the Clayton law stood alone, upon the facts stated, I question whether the appearance of a violation of that law appears in the instant case and doubt whether the commission could proceed as for a violation of that law.

The Federal Trade Act

But the Federal Trade Commission act has provided as an administrative agency equipped with an interpretive discretion, operative between the legislative act and the judicial review, authorized to take notice of all declarations of public policy in the field of free and fair competition and to prevent the use of any and all methods whether specifically defined by statute or not, which, because of a dangerous tendency unduly to hinder competition, contravene the public policy wherever found to be authoritatively declared.

In this aspect of the law it seems to me that it is unnecessary to consider whether the Sherman law or the Clayton law have been or will be violated by the proposed merger. The public policy as declared in the Clayton law is certainly opposed to the proceedings under consideration. That fact appearing, in my view of the law, the issue of a complaint under section 5 of the Federal Trade Commission act, is indicated as the necessary and proper procedure. For it is that act, if any, which has been violated by the pending merger of these three companies.

I do not commit myself to adherence to this view on final decision. It is the line of thought which has led me to vote for the issue of a complaint. I shall await the arguments of learned counsel with much interest and I hope, an open mind. Of course this is merely an individual expression. It is not to be attributed to the commission—nor to any other commissioner.

NELSON B. GASKILL,
Commissioner.

Broadening Control of Railroad Shipments

WASHINGTON, Sept. 5.—Broadening its scope of control under its car service No. 24, the Interstate Commerce Commission last Thursday brought all railroads under its scope when it directed those west of the Mississippi river to give priority and preference to the movement of food for human consumption, feed for live stock, live stock, perishable products and fuel and to return empty cars intended to be used to carry these commodities. The order previously covered railroads east of the Mississippi river only. The order possesses the possibilities of delaying shipments of iron and steel and other products not included in the priority classification mentioned.

At the time this order was issued, the Federal Fuel Distributer announced details for the expedition of the movement of coal to the upper Great Lakes region, the statement being made that the plan was intended to be put into effect on Monday, Sept. 4 with the hope that 1,000,000 tons of coal may be started lakeward this week.

The circular points out that amendment No. 4 to service order No. 23 of the Interstate Commerce Commission transfers lake coal from class 3 to class 2 and covers all bituminous coal consigned to pools, or large cargo, or bunkerage coal, at any port on Lake Erie for transshipment by water to ports above Lake Erie. Pool coal will be consigned to the Ore and Coal Exchange at Lake Erie ports, but under the rules of the exchange, may not be so consigned until a permit has been issued by the exchange admitting the coal to the pools.

A. W. Gregg, general superintendent, the Whiting Corporation, Harvey, Ill., will address the first fall meeting of the Chicago Foundrymen's Club at the City Club, Chicago, on the evening of Sept. 9. He will discuss molding sand, the condition of foundry floors and various labor saving devices in the foundry.

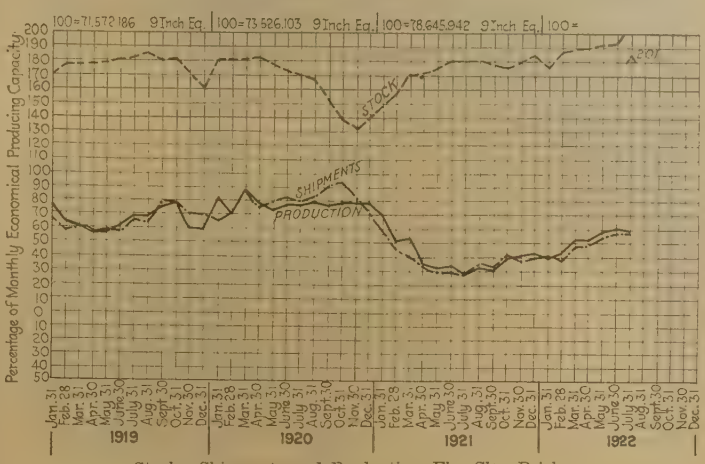
The Magma Copper Co., Superior, Ariz., is planning to increase the capacity of its plant from 300 to 600 tons per day, and to erect a smelter. It expects the initial capacity to be about 500 tons per day.

Charts Showing Condition of Brick Industry

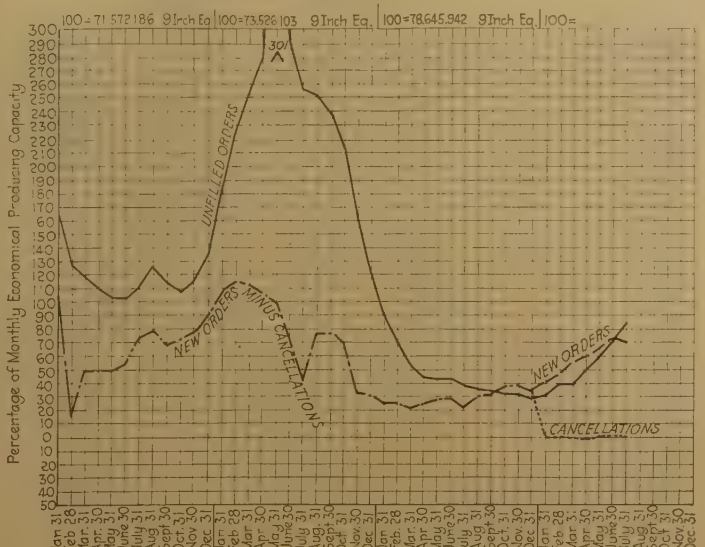
Monthly charts compiled by the Refractories Manufacturers' Association, giving the production, shipments, stocks, new orders, unfilled orders and cancellations of fire clay and silica brick, expressed in percentages of the monthly economical producing capacity of the membership of that organization, for the month of July, has been issued. Since a large part of the production of these refractories finds its way into the iron and steel industry, and that industry lost ground as to plant operations in July, it is natural that the report should make a rather unfavorable showing as compared with the two previous months, when the effect of the coal strike was not being seriously felt and bad railroad transportation conditions were still in the future.

As of July 31, stocks of fire clay brick were about 201 per cent of monthly economical producing capacity, against about 193 per cent a month before; production at the end of July was at the rate of 60 per cent, against 61 per cent at the end of June, and July shipments were about the same as those of the previous month, or approximately 59 per cent. Unfilled orders were boosted to 87 per cent, as compared with 70 per cent in June, this being ascribable to the inability of Southern manufacturers to ship freely on account of railroad congestion and a slowing down in specifications on orders in other sections. Cancellations were equal to about 1 per cent of the monthly economical capacity, or about the same as in June.

Stocks of silica brick, as of July 31, were about 138 per cent of monthly producing capacity, against 142 per cent at the end of June; production 41 per cent, against 42 per cent; shipments 146 per cent, against 139 per cent; unfilled orders 75 per cent, against 74 per cent, and new orders 59 per cent, against 51 per cent. There were cancellations in July equivalent to 3 per cent of monthly capacity, as contrasted with none in June.



Stocks, Shipments and Production, Fire Clay Brick



Unfilled Orders, New Orders and Cancellations, Fire Clay Brick

Large Increase in Coal Output

WASHINGTON, Sept. 5.—Soft coal production for the week of Aug. 28-Sept. 5 took a decided and expected upward turn, the Geological Survey estimating that it amounted to 9,200,000 or possibly 9,700,000 tons. It is a direct reflection of the result of the resumption of mining operations under the Cleveland agreement. For the week preceding the output was 6,700,000 tons, so that the gain aggregated between 2,500,000 and 3,000,000 tons. It emphasizes more than ever that the problem now faced by the country is one of transportation more than of bituminous production. Concern as to an adequate supply of soft coal now has passed, but legislation looking to distribution under Government authority, with priorities over car movements, has in mind the proper distribution of soft coal. There are those who think legislation of any kind now is unnecessary, but the Government apparently fears that many industries, as well as households, would be deprived of coal by unduly heavy shipments to some sources not given preferred ratings.

The rapid gain in output is indicated by the daily carloadings. Following a sharp increase on Friday and Saturday of week before last, as coal began to flow in volume from the mines of Illinois and Indiana, last week opened with loadings of 30,054 cars on Monday. A decline to approximately 28,000 cars on Tuesday and Wednesday marked the first tightening of car supply. On Thursday additional shipments began from western Pennsylvania, and loadings reached 29,027 cars. Complaints of lack of cars already have been received from the union districts of eastern Ohio and northern West Virginia. One week previously it was the supply of mine labor; now it is transportation.

With the accumulation of orders for steel products, particularly rails, the plant of the Monterey Iron & Steel Co., Monterey, Mexico, is being taxed almost to capacity. It is announced that the limited output will be increased to 600 tons within a short time. At present the number of employees has risen to 3500, and an increment of 1500 will be set at work as soon as the fourth open-hearth furnace is ready for operation. It is also announced that the plant of the Monterey Wire Nail Co., which was established by St. Louis interests, is once more in operation and will soon be running to capacity.

Stove and furnace manufacturers in Detroit report a heavy demand for gas stoves, with furnace sales below anticipation. This may be a reflection of the building conditions which are badly hampered by lack of brick and cement.

Iron and Steel Exports Fall Heavily

Drop 26 Per Cent Below June, and July Shows Smaller Than Any Other Month Since February— Japan Buys Less Here

WASHINGTON, Sept. 5.—Exports of iron and steel in July showed a sharp decline to 157,169 gross tons, valued at $14,611,590, and were the lowest for the current year, or since December, 1921, when the total was 134,415 tons. Compared with June, the decrease was 55,126 tons, or 26 per cent. The falling off is attributed to restricted buying by foreign sources, especially Japan, and to the hampered condition of the iron and steel industry in this country on account of the fuel and rail situation.

It is interesting to observe that Canada, normally the largest consumer outside of the United States, of American iron and steel, again took first place in July, after this rank had been held for a long period by Japan. Exports to these countries were 48,010 and 37,585 tons, respectively. Indicative of the restricted character of foreign markets for American iron and steel products in July, it will be observed that the shipments to these two countries amounted to 85,595 tons, or 54.1 per cent of the total exports for that month. The figures also are significant in showing how Japanese buying has contracted. Shipments to that country

Exports, January, 1920, to July, 1922, Inclusive

	Gross Tons		
	All Iron and Steel	Pig Iron	Semi-finished Material
Calendar year 1919...	4,239,837	309,682	258,907
January, 1920	333,601	18,468	19,937
February	308,185	15,739	22,693
March	417,216	22,740	30,444
April	395,120	14,608	19,032
May	420,359	13,032	16,370
June	402,707	17,075	29,811
Fiscal year 1920.....	4,212,732	248,126	288,766
July	458,866	29,647	17,243
August	431,434	22,645	20,920
September	409,200	22,724	18,113
October	452,015	17,296	11,853
November	434,297	13,929	7,042
December	498,765	10,055	3,415
Calendar year 1920...	4,961,851	217,958	216,873
January, 1921	547,394	3,710	315
February	393,328	1,307	92
March	230,635	2,320	1,023
April	162,592	1,234	678
May	142,551	2,541	749
June	119,081	1,689	1,106
Fiscal year 1921.....	4,168,619	129,541	82,549
July	86,523	2,744	363
August	75,827	2,424	2,447
September	95,169	3,078	1,318
October	106,582	2,830	153
November	122,290	1,299	1,869
December	134,415	2,550	250
Calendar year 1921...	2,213,042	28,305	10,363
January, 1922	160,920	1,043	4,683
February	133,975	1,430	6,627
March	208,843	2,724	10,002
April	198,830	2,750	9,376
May	230,062	3,897	13,091
June	212,295	1,996	13,178
Fiscal year 1922.....	1,721,418	28,330	63,127
July	157,169	1,943	10,149

Destination of July, 1922, Exports of Iron and Steel in Lots of 500 Tons or More

Country	Gross Tons	Country	Gross Tons
Canada	48,010	Peru	2,414
Japan	37,585	Chile	1,882
Cuba	11,414	Hongkong	1,861
Brazil	7,539	Chosen (Korea)	1,186
Argentina	7,538	Honduras	991
Mexico	5,140	Dutch East Indies	943
Great Britain	4,273	Kwangtung	732
Colombia	3,799	Portuguese E. Africa	699
British India	3,677	Venezuela	604
Philippines	3,628	Uruguay	603
China	3,171	Guatemala	538
Australia	2,839	Ecuador	501
British South Africa.	2,804		

Countries of Consumption

The principal countries of consumption of some of the leading iron and steel products exported in July, 1922, were as follows:

Plates		*Black Steel Sheets*	
Canada	3,760	Japan	8,152
Hongkong	1,403	Canada	3,526
Steel Rails		*Barbed Wire*	
Japan	16,886	Argentina	2,657
Cuba	4,584	West Indies	1,705
Canada	2,364	Central America	893
		Australia	708

Number and Values of Machine Tools Exported in June and July

	June, 1922 Number	June, 1922 Value	July, 1922 Number	July, 1922 Value
Lathes	64	$84,198	76	$61,443
Boring and drilling machines	273	68,580	65	28,059
Planers, shapers and slotters	45	52,280	26	33,881
Bending and power presses	32	31,531	18	7,351
Gear cutters	15	15,937	37	25,791
Milling machines	39	51,622	25	27,597
Sawing machines	24	6,678	12	1,013
Thread cutting and screw machines	33	17,290	24	16,756
Punching and shearing machines	62	20,685	31	9,581
Power hammers	38	3,162	12	8,973
Rolling machines	1	585	20	129,881
Wire-drawing machines	139	3,152	2	2,475
Polishing and burnishing machines	4	894	1	330
Sharpening and grinding machines	1,270	69,297	1,062	54,483
Total	2,039	425,891	1,411	407,614

Exports of Iron and Steel—Gross Tons

	July, 1921	July, 1922	Seven Months Ending July 1921	Seven Months Ending July 1922
Pig iron	2,744	1,943	15,493	15,773
Ferromanganese	15	179	413	908
Ferrosilicon	64	.....	218	249
Scrap	1,524	3,939	24,198	49,298
Ingots, blooms, billets, sheet bar, skelp	363	10,149	4,326	111,710
Iron and steel bars	5,534	12,927	163,990	114,428
Alloy steel bars*	.....	146	.....	2,781
Wire rods	854	1,844	10,964	34,135
Plates, iron and steel	6,205	6,932	282,414	65,903
Sheets, galvanized	2,634	9,245	40,578	73,312
Sheets, black steel	6,819	12,830	70,459	182,368
Sheets, black iron	652	923	9,756	7,562
Hoops, bands, strip steel	1,263	3,237	13,393	19,855
Tin plate, terne plate, etc.	3,024	4,038	77,302	49,452
Structural shapes, plain material	11,320	8,676	244,810	63,636
Structural material, fabricated	294	3,221	9,401	24,443
Steel rails	20,074	29,919	256,938	184,363
Rail fastenings, switches, frogs, etc.	16	3,500	6,558	21,995
Boiler tubes, welded pipe and fittings	14,723	11,879	290,322	105,904
Cast iron pipe and fittings	2,634	2,948	37,814	15,203
Plain wire	1,860	9,529	55,689	78,394
Barbed wire and woven wire fencing	1,432	10,250	20,372	42,187
Wire cloth and screening*	.....	154	.....	776
Wire rope and cable*	.....	620	.....	2,601
Wire nails	992	2,881	17,296	42,160
All other nails and tacks	487	760	3,831	5,421
Horseshoes	12	145	364	485
Bolts, nuts, rivets and washers, except track	1,028	1,725	19,449	10,436
Car wheels and axles†	.....	1,524	.....	10,453
Iron castings†	.....	749	.....	5,982
Steel castings†	.....	108	.....	1,358
Forgings†	.....	238	.....	1,500
Machine screws†	.....	11	.....	98
Total	86,523	157,169	1,676,348	1,345,129

MACHINERY EXPORTS
By Value

	July, 1921	July, 1922	Seven Months Ending July, 1921	Seven Months Ending July, 1922
Locomotives	$876,840	$289,250	$21,621,713	$5,471,714
Other Steam Engines	.....	950	98,340	33,311
Boilers	282,080	133,555	4,053,350	563,665
Accessories and Parts	.....	1,170,763	.....	1,550,225
Automobile Engines	108,472	551,189	1,195,920	3,773,086
Other Internal Combustion Engines	300,077	303,977	4,450,701	2,301,380
Accessories and Parts for	.....	194,653	.....	1,536,991
All Other Parts of Engines	551,284	.....	9,090,197	.....
Complete Tractors, except Agricultural	29,990	525	5,603,874	70,612
Electric Locomotives	423,176	.....	1,204,698	.....
Other Electric Machinery and Apparatus	1,716,498	444,404	19,813,207	5,435,918
Excavating Machinery	114,241	.....	1,684,493	.....
Concrete Mixers	23,440	93,702	451,666	338,301
Road Making Machinery	68,530	.....	643,548	.....
Elevators and Elevator Machinery	130,179	.....	1,556,862	.....
Mining and Quarrying Machinery	482,677	303,727	5,702,109	2,210,046
Oil Well Machinery	708,923	.....	8,869,353	.....
Pumps	513,749	474,452	9,713,679	3,276,063
Lathes	191,983	61,443	2,526,987	463,935
Boring and Drilling Machines	.....	28,059	.....	363,087
Planers, Shapers and Slotters	.....	33,881	.....	181,861
Bending and Power Presses	.....	7,351	.....	246,676
Gear Cutters	.....	25,791	.....	63,004
Milling Machines	.....	27,597	.....	186,242
Sawing Machines	.....	1,013	.....	28,281
Thread Cutting and Screw Machines	.....	16,756	.....	103,591
Punching and Shearing Machines	.....	9,581	.....	106,130
Power Hammers	.....	8,973	.....	64,771
Rolling Machines	.....	129,881	.....	154,385
Wire-drawing Machines	.....	2,475	.....	9,701
Polishing and Burnishing Machines	.....	330	.....	10,009
Sharpening and Grinding Machines	105,293	54,483	873,361	439,979
Other Metal Working Machinery and Parts of	1,437,219	489,306	12,551,150	3,112,798
Textile Machinery	896,201	1,471,016	12,198,328	10,314,101
Sewing Machines	365,414	640,470	4,771,646	3,468,550
Shoe Machinery	99,926	127,087	1,356,572	584,114
Flour-Mill and Gristmill Machinery	91,247	181,233	1,306,774	821,691
Sugar-mill Machinery	441,873	365,755	12,855,992	1,543,890
Paper and Pulp Mill Machinery	228,923	.....	1,840,506	.....
Sawmill Machinery	81,325	25,575	856,598	341,752
Other Woodworking Machinery	110,035	161,331	2,106,663	735,997
Refrigerating and Ice Making Machinery	102,796	101,256	1,262,151	1,214,420
Air Compressors	154,956	166,475	3,079,683	1,180,899
Typewriters	726,756	884,427	8,689,946	6,812,059
Power Laundry Machinery	50,026	70,536	702,631	349,539
Typesetting Machines	273,335	207,176	2,417,235	2,254,279
Printing Presses	422,007	218,062	5,794,320	2,253,640
Agricultural Machinery and Implements	.....	.....	.....	.....
All Other Machinery and Parts	11,687,829	10,351,967	135,563,191	73,259,972
Total	$23,797,800	$19,830,443	$306,507,444	$137,230,755

in June amounted to 85,806 tons. The greatest single item of export in July was steel rails, the total amounting to 29,919 tons, of which Japan took 16,886 tons.

In the table showing tonnage exports to those countries which took 500 tons or more, only 2798 tons are unaccounted for, this representing the sum of the smaller lots. Of those shown, 66,093 tons went to North and Central America and the West Indies, 48,212 tons to Asia, 24,880 tons to South America, 7410 tons to Oceania, 4273 tons to Europe (Great Britain) and 3503 tons to Africa.

July exports for this year, however, were much heavier than they were for the same month of last year, when they totaled only 86,523 tons. For the seven-month period ending with July, 1922, exports amounted to 1,345,129 tons, valued at $115,076,182, compared with 1,682,104 tons for the first seven months of 1921.

Machinery exports, exclusive of vehicles, were valued at $19,830,443, as compared with $23,554,356 in June and with $23,797,800 in July, last year.

The number of metal working machine tools in July amounted to 411 as against 2039 in June. Because of the wide difference in the sizes of these tools, a mere statement of the number exported does not give a clear view for a study of the market, and for that reason the accompanying table is given showing both the number and the value of these tools exported in June and July.

Imports during July amounted to 71,971 gross tons, compared with 10,296 tons in July, 1921. For the seven months the imports were 187,684 tons, against 62,438 tons last year. Thus the imports for the one month, this year, exceeded the imports for the seven months, last year. Pig iron accounted for 18,828 tons in July, 1922, or more than the 15,595 tons for the first seven months of 1921. Ferromanganese imported in July, 1922, was 25,841 tons, or nearly five times the amount for seven months, last year.

Imports of Iron and Steel—Gross Tons

	July 1921	July 1922	Seven Months Ending July 1921	Seven Months Ending July 1922
Ferromanganese	275	25,841	5,481	53,134
Ferrosilicon	309	2,300	1,922	7,076
Pig iron	2,567	18,828	15,595	45,227
Scrap	1,650	9,795	21,381	38,960
Steel bars	340	232	1,343	988
Bar iron	274	10,131	1,006	11,531
Structural steel	46	34	405	275
Billets, without alloys	2,469	66	2,916	5,648
All other billets	22	232	1,020	989
Steel rails	2,597	4,077	11,898	20,435
Sheets and plates	10	156	1,822	329
Tin and terne plates	....	37	308	2,118
Wire rods	77	244	506	974
Total	10,296	71,971	62,438	187,684
Manganese ore and oxide	5,368	62,518	298,746	210,747

British Steel Exports Increase—Imports Smallest Thus Far in 1922

The July official returns on British foreign trade in steel iron show that the total exports were 251,743 gross tons. This is a slight increase of 2654 tons over the June total. The July exports make the average for the first seven months 268,160 tons per month. Exports of scrap are included in these totals. To Aug. 1, this year, total exports has been 1,791,681 tons against 935,950 tons for the same seven months in 1921.

The July imports were 55,893 tons or the lowest this year. The average for the first seven months is now 72,370 tons per month. In the first quarter the monthly average was 82,536 tons. These data include scrap. The following table shows comparative data:

British Steel Exports and Imports, Gross Tons

	Exports	Imports
May, 1922	300,981	72,427
June, 1922	249,089	58,856
July, 1922	251,743	55,893
Aver. per month, first quarter, 1922	267,047	82,536
Aver. per month, second quarter, 1922	274,830	67,785
Aver. per month, third quarter, 1922	267,271	62,392
Aver. per month, 1921	144,885	152,734
Aver. per month, 1920	274,881	128,685
Aver. per month, 1919	188,519	50,801
Aver. per month, 1913	420,757	195,264

The following table covers the principal exports:

Principal British Exports, Gross Tons

	Average per Month 1913	Average per Month 1921	July 1921	July 1922
Pig iron	78,771	8,602	7,777	27,675
Steel rails	41,676	14,698	1,581	6,955
Steel plates	11,162	10,673	2,680	6,238
Galvanized sheets	63,506	17,635	2,691	37,739
Steel bars	20,921	8,927	2,702	20,221
Tin plates	41,208	18,873	8,827	40,809
Black plates	5,679	1,178	500	5,429
Steel sheets	....	....	779	13,356
Total exports, first 7 months, 1922				1,791,681
Total exports, first 7 months, 1921				935,950

The most marked recovery in the July exports this year over those in July, 1921, has been in tin plates, galvanized sheets, steel bars, pig iron and steel sheets.

Pig iron imports in July were 6738 tons, compared with a monthly average in 1921 of 55,564 tons.

Iron ore imports in July were 287,213 tons, which compares with a monthly average in 1921 of 157,298 tons.

Manganese ore imports in July were 27,415 tons. Last year they were 14,405 tons per month and in 1913 they were over 50,000 tons per month.

Tense Conditions in Connellsville Region

Coal and Coke Production Increasing—Frick Company and Some Independents Still Resist Unions—Demonstration on Labor Day

UNIONTOWN, Pa., Sept. 5.—Ten thousand United Mine Workers marched in a Labor Day parade here yesterday under the auspices of the Uniontown Trades and Labor Council, but in effect it was a United Mine Workers demonstration. Fifteen thousand people heard the speaking program in a baseball park during which James H. Maurer, head of the Pennsylvania Federation of Labor, bitterly assailed Attorney-General Daugherty for his action in securing Federal injunction in the railroad strike and attacked the Administration officials at Washington as dumb-bells and fossils. He charged the Administration action in the strike situations as being in the interest of big business. Organizer William Feeney of the Mine Workers claimed that the union efforts, being centered in the Connellsville bituminous region, were succeeding, and that 50 plants had been signed, denying that all of the plants were small operations. John O'Leary, mine worker organizer, said appeals were being sent union miners for financial assistance for Connellsville region strikers. A copy of a circular appeal says: "Five of our miners have been brutally murdered, and 25 others shot by hired gunmen. Thousands have been beaten by coal company thugs and State police, many of them made cripples for life." It adds: "Five thousand of the miners, with their wives and children, have been evicted from their homes, and 10,000 others have been served with eviction notices. The jails are filled with miners through trumped up charges brought against them by coal company hirelings." The circular closes with these words: "Immediate assistance is necessary to insure victory for these miners who are still on strike."

Financial Aid Imperative

The union apparently realizes immediate financial assistance is necessary to keep the men out and that returns from the check-off at union plants which have just resumed will come too late to count.

The demonstration was orderly and no trouble marked the day. Last night, however, a mine deputy was shot from ambush at Smock, as a result of which eight men were arrested. The deputy is believed to be dying.

Coal and coke production in the region is increasing rapidly. Big gains are being made in the Fair Chance district, where the famous strike of 1891 was broken. The union leaders declared that formal appeals had been made to the operators to get and sign the scale, and, if this is ignored, the strike will be fought to a finish. Miner delegations met at Brownsville yesterday in convention to discuss organization of a separate union district.

Small Operators Sign

Operators signing the scale, possibly totaling 30, are small producers, most of them team track mines. The Frick company and the large independents are firm in their stand. In fact they say that the strike has been broken.

The effect of the big miner demonstration is expected to be the temporary bolstering up of the organization. Most observers say, however, that immediate financial assistance will be necessary to hold the men in line. Reports of disorders in the county being published outside grossly exaggerate conditions. It is admitted that the situation is tense, but it is believed that the State police and deputies have the situation well in hand.

The Frick and independent companies are centering their efforts on increasing production. Failure of the men to accept the new scale is being met with resumption of evictions as room is being made at company houses for imported workers.

Conditions in Detroit Are More Hopeful

DETROIT, Sept. 5.—Detroit and Michigan industries are hopeful that the arterial railroads will be able to deliver the fuel promised them. Most of the lines operating into Detroit claim to be in a position to handle speedily all coal delivered to them. About 3000 cars, or a little more than half of Detroit's needs, have been brought into the city in the last seven days. With increasing daily shipments in transit, hopes are high for adequate supply for industrial purposes. The real burden is now placed on the railroads. Numerous rumors, which always supplement any announcement by the Ford company, are prevalent, but the original closing down notification effective Sept. 16 has not been modified in any way.

The leading coke producer has announced an appreciable advance on all grades for September delivery. Foundries are limited to their actual melt. The first dwindling supply of silvery iron has developed requests for maximum silicons in the regular grades.

Priority listings have placed sand and fire brick in a position that is causing the foundrymen caught short of these materials to worry.

The automobile industry maintains its unprecedented stride for this time of the year. Present production schedules carry through the fourth quarter and manufacturers generally are covered for raw and finished materials over this period. The heaviest demand is now coming from the agricultural sections for passenger cars. This is a direct switch, as the early and mid-season demand for this type of car came from the industrial and commercial centers. With the exception of one or two makers that have advanced slightly, manufacturers with large production have set their lists for the remainder of the year.

The recent lay-off at the Ford tractor plant is recorded in the figures of the Detroit Employers' Association which shows 177,000 employed as against 183,000 a week ago.

The Michigan Manufacturers' Association, citing the railroad situation as having threatened production and looming even more as a menace in the present fuel shortage, has appealed to President Harding and Congress to put teeth in the Esch-Cummins bill. It specifically asks that laws be enacted to prohibit conspiracies resulting in strikes or interruption of the transportation system of this country and provide penalties therefor.

Pipe jobbers are unable to obtain their requirements of standard pipe or boiler tubing. Manufacturers will not promise definite delivery dates. Full finish and auto body sheets are still in urgent demand with deliveries about meeting weekly needs.

The Steel Corporation subsidiary is quoting 3.35c. on black sheets and 4.35c. on galvanized sheets. How-

ever, deliveries at these prices are extended and indefinite. The independents, with one exception, are quoting 3.50c. on black and 4.50c. on galvanized. Full finished sheets are quoted at 4.70c. to 4.85c.

Slowly Recovering in Mahoning Valley

YOUNGSTOWN, Sept. 4.—This district is beginning to recover in an operating way from the restrictions imposed by the coal strike, the settlement of which has eased up the fuel supply to a point which has permitted the starting up of four idle blast furnaces. The Youngstown Sheet & Tube Co. has put on two stacks, now having three of its six furnaces making iron, while the Brier Hill Steel Co. has put on a furnace and the Shenango Furnace Co., Sharpsville, Pa., has started its No. 1 stack. It is possible that the list of active furnaces will be further swelled before the week ends, as the Republic Iron & Steel Co. is preparing to-day to put on a furnace and the same is true of the Sharon Steel Hoop Co., with regard to its Mary furnace at Lowellville, Ohio; the Trumbull-Cliffs furnace at Warren, Ohio, and the Struthers furnace at Struthers, Ohio.

Starting of the Sharon and Struthers stacks will be governed a good deal by conditions in the Connellsville district and local advices are to the effect that between the demands of the men for recognition of the union and an increasing shortage of cars for coke shipments, the production of beehive oven coke is not increasing materially nor with much rapidity. Coke prices have eased down considerably from their peak levels, but the complaint still is heard that it is difficult to secure sufficient tonnages to insure sustained operation of blast furnaces and the coke producers still are cautious about committing themselves to long time contracts. It seems that all open-top cars are being taken for coal shipments and lacking sufficient cars, operators are reluctant to charge the ovens.

Steel works operations have increased with most of the independent companies, which now have 42 open-hearth furnaces in operation, as against 30 last week, and one Bessemer plant as against none last week. Pig iron production has gained, but not to the extent indicated by the starting up of so many steel-making units, which may be at least partly ascribed to increased use of scrap. Suspension of shipping instructions on scrap contracts has been quite generally lifted and some fresh buying is noted, notably on the part of a Warren, Ohio, steel maker, who has lately taken several thousand tons of cast iron car wheels to replace pig iron at a price of about $22 per gross ton delivered.

The best showing in operations of finishing mills is in the sheet mills. Out of a total of 110 such units all but 12 are scheduled. It is said that sheets are more profitable at present prices than any other product made in the Youngstown mills and steel consequently is going pretty heavily to that use.

In the steel market advances over Steel Corporation prices of sheets of $2 to $3 are asked by independents and from $3 to $5 on top of that for very early shipment. On plates the independent market here is from 2.25c. to 2.50c. The bar market is not clearly defined, because so little tonnage is available, but it is certain that less than 2c. can not be done. On strips the local makers are at 2.75c. base on hot-rolled and 4.25c. base on cold-rolled for fourth quarter shipment.

To provide 30,000,000 new cement sacks every year, 17,000 miles of 30-in. cotton cloth are required. This calls for 30,000 bales, or 15,000,000 lb., of cotton, and a year's work for 1600 cotton looms. Practically 90 per cent of the 380,000,000 sacks of Portland cement shipped in the United States last year was delivered in cotton sacks each containing 94 lb. of cement. The mills carry some 200,000,000 sacks in reserve.

Voters of Martins Ferry, Ohio, will vote in the November election on a bond issue of $400,000, the proceeds of which will be used for a new water works and power plant.

Industrial Activities

At the Boston & Maine Railroad, Concord, N. H., repair shops, 620 men were at work last week, contrasted with 800, a normal force. Of the 620, 253 are in the motive power department and the rest in the car department.

The Bethlehem Shipbuilding Corporation, Ltd., has approximately 3200 men on the payroll at its Fore River Works, Quincy, Mass., whereas in 1914, 3000 were employed. The plant is engaged in converting a battle cruiser into an airplane carrier for the Government.

The closing of the Ford plant is reflected in various New England manufacturing centers, where plants were engaged in turning out Ford parts. A majority of such plants, however, have sufficient other business on their books to keep fairly well occupied. New England's automobile industry is curtailed. The Locomobile Co., Bridgeport, Conn., is getting on its feet after having been taken over by new management, and the Rolls-Royce Co. of America, Inc., has sufficient business on its books to keep its plant running on present schedule the rest of 1922, at least. The other two most important concerns remain in the hands of receivers.

Henry Disston & Sons, Inc., Philadelphia, manufacturer of saws, files, etc., is operating its plant at close to capacity, giving employment to more than 3500 persons. At this same time a year ago the works were running at about 50 per cent of normal.

The Singer Mfg. Co., Elizabethport, N. J., manufacturer of sewing machines and parts, has advanced production by five hours a week, effective Sept. 5, affecting about 6500 employees. The working schedule will be changed from 8 a. m. to 4:45 p.m., five days a week, as operative for about 18 months past, to 7:30 a. m. to 5:15 p. m. with continuance of a five-day week for the present.

The American Car & Foundry Co., Terre Haute, Ind., is gradually increasing the working force at its local plant, and is now giving employment to approximately 1000 men under a full-time schedule. It is said that orders on the books insure this basis of operation for at least 12 months ahead.

The Gilbert & Barker Mfg. Co., Springfield, Mass., manufacturer of gasoline tanks, pumps, etc., has placed a night shift in operation at its plant to handle increased orders. All departments are now running on full time, or overtime, with a total working force of about 1200 persons.

Refractory manufacturing plants at Mount Union, Pa., are running at full capacity and effective Sept. 1, the wages of all classes of employees have been increased; laborers have been advanced from $2.70 to $3.50 a day, and corresponding increase given to skilled workers. The plants affected are those of the Harbison-Walker Co., the General Refractories Co., and the United States Refractories Co.

The Tacony Steel Co., Tacony, Pa., is maintaining production on a full 100 per cent basis at its rolling mills. Other plant departments are running at from 40 to 50 per cent of normal.

The Manganese & Steel Foundry, Ltd., has reopened the plant of the Sherbrooke Iron Works, Sherbrooke, Que., recently acquired, closed for some time past. Initial production will require about 3 tons of pig iron daily, and this rate will be increased gradually until capacity is reached.

Following the recent wage advance of 16 2/3 per cent at the main plant of the Nicholson File Co., Providence, R. I., and the adoption of a full time working basis, effective Sept. 5, replacing a five-day week, the company has made a corresponding advance at its branch plant at Anderson, Ind., as well as at the works of its subsidiary, the G. & H. Barnett Co., Philadelphia. About 1200 employees are affected at the Providence plant, and approximately 500 workers at each of the other two factories.

AUGUST PIG IRON OUTPUT

Loss in August 19,006 Tons Per Day as Compared With July

Thirty-seven Furnaces Blown Out or Banked, Nine Blown In

The full effect of the railroad and coal strikes on the country's pig iron output is shown by the August returns for blast furnace production, particularly in the net loss of furnaces in active operation. During August there were 37 furnaces blown out or banked and nine blown in, a net loss of 28. This compares with a net loss in July of 20. Despite this sharp loss in active operation, the August total was substantially higher than the January or February output and not far from twice that of August, 1921, when the depression was at its height. The actual loss in daily output in August from that in July was 19,006 tons per day.

The production of coke and anthracite pig iron for the 31 days in August amounted to 1,816,170 gross tons, or 58,586 tons per day, as compared with 2,405,365 tons, or 77,592 tons per day in July, also a 31-day month. In February this year the daily output was 58,214 tons, so that the effect of the strikes has been to put the industry back to where it was early in the year.

The total number of furnaces in blast on Sept. 1 was 144, as compared with 172 on Aug. 1, and with only 69 on Aug. 1, 1921, the low point in last year's depression. The capacity of the 144 furnaces in blast on Sept. 1 is estimated at 54,645 tons per day, as compared with 70,605 tons per day for the 172 furnaces in blast on Aug. 1. The fact that most furnaces at the end of the month were operating at a very slow rate because of fuel and other conditions, makes the estimated capacity lower than it ordinarily would be.

The manganese alloy output for August also suffered a decline. The total was 19,327 tons, as compared with 26,049 tons in July. Of the August output 11,402 tons was ferromanganese and 7925 tons was spiegeleisen.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from August, 1921, is as follows:

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works	Merchant	Total
August, 1921	26,037	4,743	30,780
September	27,189	5,661	32,850
October	33,365	6,850	40,215
November	37,960	9,223	47,183
December	41,173	12,023	53,196
January, 1922	42,130	10,933	53,063
February	46,827	11,387	58,214
March	53,547	12,128	65,675
April	56,930	12,140	69,070
May	60,619	13,790	74,409
June	67,053	11,740	78,793
July	62,295	15,297	77,592
August	45,672	12,914	58,586

The figures for daily average production, beginning with January, 1916, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1916—Gross Tons

	1916	1917	1918	1919	1920	1921	1922
Jan.	102,746	101,643	77,799	106,525	97,264	77,945	53,063
Feb.	106,456	94,473	82,335	105,006	102,720	69,187	58,214
Mar.	107,667	104,832	103,648	99,685	108,900	51,468	65,675
Apr.	107,592	111,165	109,607	82,607	91,327	39,768	69,070
May	108,422	110,238	111,175	68,002	96,312	39,394	74,409
June	107,053	109,002	110,793	70,495	101,451	35,494	78,701
July	104,017	107,820	110,354	78,340	98,931	27,889	77,592
Aug.	103,346	104,772	109,341	88,496	101,529	30,780	58,586
Sept.	106,745	104,465	113,942	82,932	104,310	32,850	.....
Oct.	113,189	106,550	112,482	60,115	106,212	40,215	.....
Nov.	110,394	106,859	111,802	79,745	97,830	47,183	.....
Dec.	102,537	92,997	110,762	84,944	87,222	53,196	.....

Among the furnaces blown in during August were the following: One No. 6 furnace of the Lackawanna Steel Co. in the Buffalo district; B furnace of the Bethlehem Steel Co. in the Lebanon Valley; B furnace of the Bethlehem Steel Co. in the lower Susquehanna Valley; Nos. 2 and 3 Clairton furnaces and No. 2 Duquesne furnace of the Carnegie Steel Co. and one furnace of the Jones & Laughlin Steel Co. in the Pittsburgh district; one Shenango furnace in the Shenango Valley; Mary furnace in the Mahoning Valley (Sept. 1) and Tuscaloosa furnace in Alabama.

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces for August and the three months preceding:

Pig Iron Production by Districts, Gross Tons

	August (31 days)	July (31 days)	June (30 days)	May (31 days)
New York	77,222	145,831	148,115	150,141
New Jersey	11,604	10,745	10,725	5,636
Lehigh Valley	46,254	58,068	66,967	66,572
Schuylkill Valley	35,286	54,675	60,925	66,669
Lower Susquehanna and Lebanon Valleys	20,679	26,698	26,501	21,313
Pittsburgh district	432,178	493,963	485,401	479,106
Shenango Valley	58,812	99,335	87,156	79,145
Western Penna.	62,659	81,927	91,494	103,072
Maryland, Virginia and Kentucky	41,324	58,506	54,687	47,862
Wheeling district	57,752	65,753	74,710	66,148
Mahoning Valley	130,555	233,813	240,470	227,053
Central and Northern Ohio	191,880	261,084	236,374	218,547
Southern Ohio	15,305	29,517	30,272	29,311
Illinois and Indiana	342,363	472,371	454,937	459,631
Mich., Minn., Mo., Wis. and Colo.	67,265	101,656	93,723	89,147
Alabama	204,389	195,929	189,101	196,104
Tennessee	17,543	15,764	9,470	1,222
Total	1,813,070	2,405,365	2,361,028	2,306,679

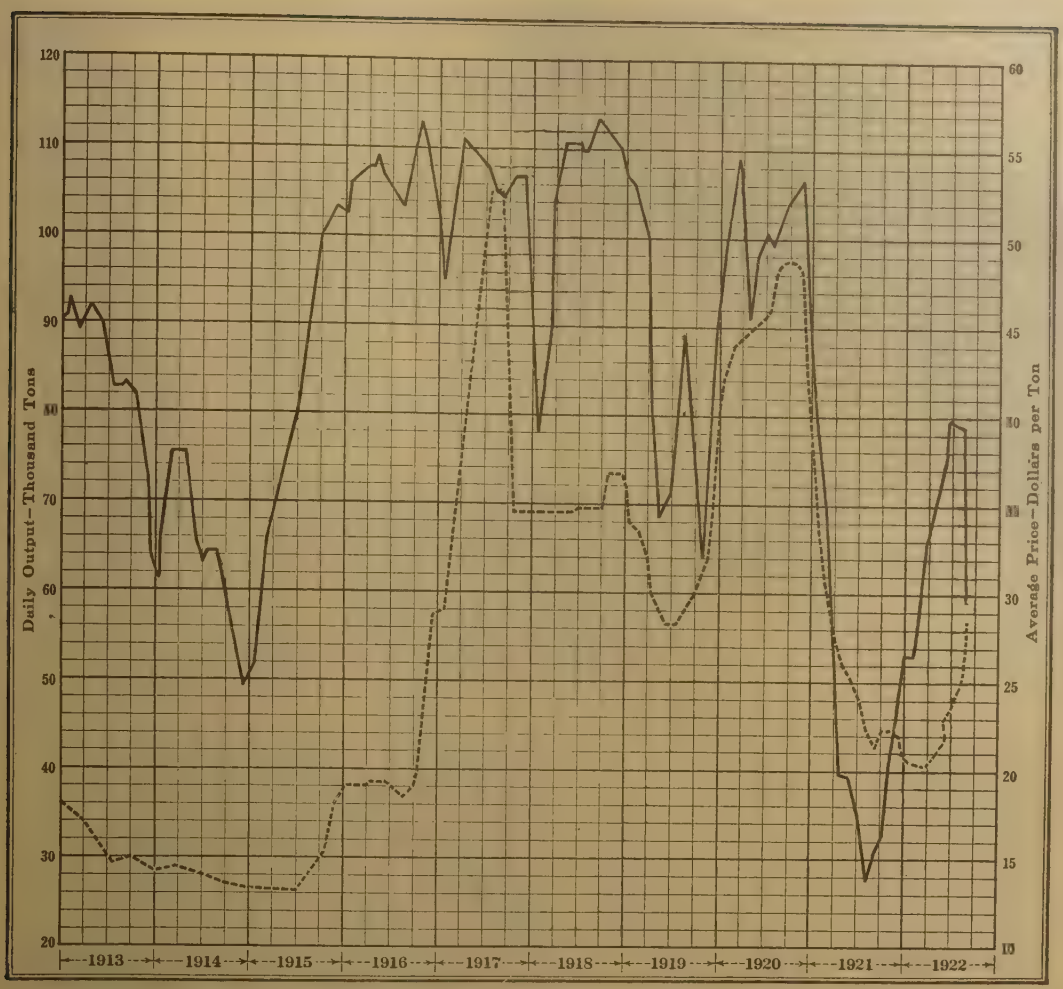
Capacities in Blast Sept. 1

The following table shows the number of furnaces in blast Sept. 1 in the different districts and their capacity, also the number and daily capacity in gross tons of furnaces in blast Aug. 1:

Coke and Anthracite Furnaces in Blast

Location of Furnaces	Total Stacks	Sept. 1 In Blast	Sept. 1 Capacity per Day	Aug. 1 In Blast	Aug. 1 Capacity per Day
New York:					
Buffalo	22	7	2,700	10	3,300
Other New York	4	0	....	0	....
New Jersey	4	1	375	1	340
Pennsylvania:					
Lehigh Valley	18	4	1,760	3	1,350
Spiegeleisen	2	1	150	1	155
Schuylkill Valley	15	4	1,025	5	1,635
Lower Susquehanna	10	2	815	1	375
Lebanon Valley	6	1	150	1	150
Ferromanganese	2	1	50	1	60
Pittsburgh District	55	34	12,100	34	15,400
Ferromanganese and Spiegel	4	2	245	2	350
Shenango Valley	19	5	2,030	7	3,000
Western Pennsylvania	26	2	850	7	2,640
Maryland	5	2	730	2	790
Ferromanganese	1	0	....	1	80
Wheeling District	15	4	1,865	4	2,035
Ohio:					
Mahoning Valley	28	9	4,500	11	5,025
Central and Northern	26	11	6,000	16	8,200
Southern	16	1	500	1	915
Illinois and Indiana	42	17	9,000	24	13,900
Mich., Wis. and Minn.	11	5	1,875	6	2,150
Colorado and Missouri	6	0	....	3	1,100
The South:					
Virginia	16	0	....	0	....
Kentucky	7	2	520	3	735
Alabama	40	22	6,770	21	6,360
Ferromanganese	1	1	70	1	50
Tenn., Ga. and Texas	16	6	565	6	510
Total	417	144	54,645	172	70,605

Among the furnaces blown out or banked during August were the following: Buffalo A furnace of the Hanna Furnace Co., Harriet Y furnace of the Wickwire-Spencer Steel Co. and Nos. 6 and 8 furnaces of the Lackawanna Steel Co. in the Buffalo district; No. 3 Swede furnace of the Alan Wood Iron & Steel Co. in the Schuylkill Valley; No. 2 Lucy furnace of the Carnegie Steel Co., two furnaces of the Jones & Laughlin Steel Co. and one Midland furnace of the Pittsburgh Crucible Steel Co. in the Pittsburgh district; Nos. 1, 2 and 3 Farrell furnaces of the Carnegie Steel Co. in the Shenango Valley; two Johnstown furnaces of the Cambria Steel Co., one Dunbar furnace and the Perry and Adrian furnaces in western Pennsylvania; one furnace of the Bethlehem Steel Co. at Sparrows Point, Md.; the Norton furnace of the Norton Iron Works in Kentucky; A and B furnaces of the Youngstown Sheet & Tube Co. in the Mahoning Valley; one Central furnace of the American Steel & Wire Co., No. 1 furnace of the Otis Steel Co. and Nos. 2 and 5 furnaces of the National Tube Co. in central and northern Ohio; No. 3 Joliet furnace and Nos. 2, 4 and 8 South Chicago furnaces of the Illinois Steel Co., one Iroquois furnace and Nos. 5 and 7 Gary furnaces in



The Full Line Represents the Daily Production of Pig Iron and the Dotted Line Is the Average of the Price Per Ton of No. 2 Southern Pig Iron at Cincinnati, Local No. 2 Iron at Chicago and No. 2X Iron at Philadelphia

the Chicago district; one Bay View furnace of the Illinois Steel Co. in Wisconsin; and A, D and E furnaces of the Colorado Fuel & Iron Co. in Colorado.

Production of Steel Companies—Gross Tons

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies, as well as from merchant furnaces producing ferromanganese and spiegeleisen, show the following totals of steel making iron, month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons

	Total Production			Spiegeleisen and Ferromanganese		
	1920	1921	1922	1920	1921	1922
Jan.	2,232,455	1,932,159	1,306,045	23,957	22,228	6,874
Feb.	2,181,679	1,625,695	1,311,170	28,038	29,013	8,540
Mar.	2,480,668	1,323,443	1,629,982	35,275	41,294	13,695
Apr.	1,968,542	1,015,621	1,707,902	27,628	24,310	19,209
May	2,128,720	1,024,678	1,879,180	33,407	9,232	20,334
June	2,209,770	883,312	1,876,033	34,751	4,536	23,090
July	2,230,567	715,664	1,931,138	36,789	5,524	26,049
Aug.	2,254,943	807,144	1,415,832	36,985	3,878	19,327
Sept.	2,247,250	815,692	.....	39,546	3,289	.....
Oct.	2,393,644	1,034,312	.....	34,786	3,902	.....
Nov.	2,150,075	1,138,789	.....	26,944	3,525	.....
Dec.	2,047,167	1,276,381	.....	28,023	3,953	.....

Diagram of Pig Iron Production and Prices

The fluctuations in pig iron production from 1913 to the present time are shown in the accompanying chart. The figures represented by the heavy lines are those of daily average production by months of coke and anthracite iron. The dotted curve on the chart represents monthly average prices of Southern No. 2 foundry pig iron at Cincinnati, local No. 2 foundry iron at furnaces in Chicago, and No. 2X at Philadelphia. They are based on the weekly quotations of THE IRON AGE.

Production of Coke and Anthracite Pig Iron in the United States by Months, Beginning Jan. 1, 1918—Gross Tons

	1918	1919	1920	1921	1922
Jan.	2,411,768	3,302,260	3,015,181	2,416,292	1,644,951
Feb.	2,319,299	2,940,168	2,978,879	1,937,257	1,629,991
Mar.	3,213,091	3,090,243	3,375,907	1,595,522	2,035,920
Apr.	3,288,211	2,478,218	2,739,797	1,193,041	2,072,114
May	3,446,412	2,108,056	2,985,682	1,221,221	2,306,679
June	3,323,791	2,114,863	3,043,540	1,064,833	2,361,028
½ year.	18,002,572	16,033,808	18,138,986	9,428,166	12,050,683
July	3,420,988	2,428,541	3,067,043	864,555	2,405,365
Aug.	3,389,585	2,743,388	3,147,402	954,193	1,816,170
8 mos.	24,813,145	21,205,737	24,353,431	11,246,914	16,272,218
Sept.	3,418,270	2,487,965	3,129,323	985,529	.....
Oct.	3,486,941	1,863,558	3,292,597	1,246,676	.....
Nov.	3,354,074	2,392,350	2,934,908	1,415,481	.....
Dec.	3,433,617	2,633,268	2,703,855	1,649,086	.....
Ttl. yr.	*38,506,047	30,582,878	36,414,114	16,543,686	.....

*These totals do not include charcoal pig iron. The 1921 production of this iron was 94,730 tons.

Building permits issued for improvements in St. Louis during August totaled $2,206,670 against $1,307,206 in August, 1921, a gain of $1,307,206. Of the expenditures last month $1,780,450 was for new structures and $426,220 for alterations.

LARGE LOCOMOTIVE BUYING

One Company Books Orders for 138—Pennsylvania Railroad Orders 100

A total of 238 locomotives have been ordered from the two leading locomotive builders within the past week, these including 100 placed with Baldwin Locomotive Works by the Pennsylvania Railroad and 50 by the Chicago & Northwestern and 50 by the Missouri Pacific placed with the American Locomotive Co. In detail the week's orders were as follows:

The Missouri Pacific and the Chicago & Northwestern each ordered 50, the former taking 46 of the Mikado type and 4 of the mountain type, while the latter ordered 40 Mikado locomotives and 10 Pacific.

The Louisville & Nashville bought 12 of the Mikado type, these being in addition to 30 that were recently ordered.

Missouri, Kansas & Texas, 10 eight-wheel switching engines.

Chicago, Indianapolis & Louisville, 4 Mikado type and 3 Pacific type.

Gibbs & Hill, 4 double unit electric locomotives.

Wheeling Steel Corporation, 1 six-wheel tank locomotive.

Superior Portland Cement Co., 1 four-wheel tank locomotive.

Vacuum Oil Co., 1 six-wheel tank locomotive.

Tavares & Gulf Railroad, 2 Prairie type.

Inquiries for freight cars have been issued as follows:

The St. Louis & San Francisco is inquiring for 1500 steel underframe hopper cars of 50-tons capacity, 1500 single-sheath 40-ton box cars and 300 steel underframe 40-ton stock cars.

The Northern Pacific is inquiring for steel center construction for 1000 cars.

The Baltimore & Ohio is inquiring for 1000 50-ton steel hopper cars.

The Belt Line Railroad of Chicago has asked bids on 150 55-ton hopper cars.

The Chicago & Northwestern is inquiring for repairs to 500 to 1000 gondolas.

The Cincinnati, Indianapolis & Western is in the market for 200 to 300 composite gondolas.

The Chicago & Eastern Illinois has inquired for prices on 17 baggage cars.

The Pennsylvania Railroad has ordered 100 locomotives from the Baldwin Locomotive Works and will build 15 additional at its own shops at Altoona, Pa.

Export Trade Dull, but Japanese Buying of Rails Continues

NEW YORK, Sept. 5—Export trade is quiet. There is some activity from Japan, a large portion of which is still Government business. One inquiry, in the market from a private source in Japan, calls for bids on 27 miles of 60-lb. rails, A. S. C. E. specifications, closing Sept. 10. The Imperial Government Railways closed Sept. 4, on 4700 tons of 75-lb., 20-lb. and 16-lb. rails, with splice bars. One Japanese export house recently received an order for 5000 boxes of oil-can tin plate from the Nippon Oil Co.

The Chinese market is dull, but exporters to the Far East dealing with China report fairly active business with the Philippine Islands. In the past fortnight, one exporter has booked orders for about 5000 kegs of nails, 400 tons of bars and 500 tons of sheets for shipment to Manila. During this period, 400 tons of flat bars was booked from China by this exporter.

Exporters and importers, which have been importing pig iron recently, continue to bring in small tonnages, largely of Scotch iron. Freight rates on iron from Glasgow to Boston, and from Glasgow to Montreal were formerly 15s. per ton. Recently the rates to Boston have increased to 18 to 20s., while the rate to Montreal is unchanged.

The Ritter Dental Mfg. Co., recently incorporated at Rochester, N. Y., is securing figures on equipment for a brass and aluminum foundry. R. J. Rosa is purchasing agent.

FABRICATED STEEL BUSINESS

Shipbuilding Company Gets Large New York Hotel Job—Other Awards

Among the fabricated steel awards of the past week are the following:

Hotel for the United Hotels Co., Forty-sixth Street and Madison Avenue, New York, 5000 tons, to New York Shipbuilding Corporation.

State Office Building, Richmond, Va., 750 tons, to Lehigh Structural Steel Co.

United Lutheran Publishing House, Philadelphia, 800 tons, to Bethlehem Fabricators, Inc.

Bridge at Fortieth Street, Philadelphia, 1300 tons, to Bethlehem Steel Bridge Corporation.

Apartment building for Clarence R. Siegel, Philadelphia, 1100 tons, to Bethlehem Fabricators, Inc.

Julia Richman High School, Second Avenue, New York, 1600 tons, to McClintic-Marshall Co.

Shore Road telephone building, Brooklyn, 800 tons, to Eidlitz & Ross. Steel to be fabricated by Bethlehem Steel Bridge Corporation.

Office building for Burroughs-Wellcome Co., East Forty-first Street, New York, 750 tons, to Hinkle Iron Works.

Apartment house in East Forty-second Street, New York, 600 tons, to Hinkle Iron Works.

Store building, Elizabeth, N. J., 400 tons, to Hedden Iron Construction Co.

Highway bridge, Binghamton, N. Y., 200 tons to American Bridge Company.

Highway bridge, LaSalle, N. Y., 100 tons to American Bridge Co.

Western Cartridge Co. buildings, Alton, Ill., 600 tons to Mississippi Valley Structural Steel Co.

Lawndale Theatre Building, Chicago, 375 tons to Gage Structural Steel Co.

International Harvester Co., five steel stacks for Wisconsin Steel Works, South Chicago, 221 tons to Graver Corporation.

South Park Commissioners, park buildings at Calumet Park, Chicago, 313 tons to unnamed fabricator.

Memorial Union Building for Purdue University, Lafayette, Ind., 160 tons to Insley Mfg. Co., Indianapolis.

Atlas Tack Co. shop building, St. Louis, 381 tons to a St. Louis fabricator.

Cleveland-Cliffs Iron Co., stocking trestle at Ishpeming, Mich., 350 tons to Worden-Allen Co.

Seaman Body Corporation, Milwaukee, automobile body shop extension, 798 tons to Worden-Allen Co.

Lehigh Portland Cement Co., Mason City, Ia., extension to crane runway, 100 tons.

Marathon Motor Car Co., Wausau, Wis., Ford garage and service building addition, 275 tons.

Steel for addition to by-product plant Carnegie Steel Co., Clairton, Pa., 6400 tons, placed through the Koppers Co.

Structural Projects Pending

Inquiries for structural steel work now being figured on include the following:

Loft building at Seventh Avenue and Thirty-seventh Street, New York, 1000 tons.

Methodist Episcopal Hospital, Brooklyn, 500 tons.

Addition to American Museum of Natural History, New York, 900 tons.

Five bridges for the Pennsylvania Railroad, 1000 tons.

Walker Hotel, Washington, D. C., 4000 tons; former inquiry revived.

Chicago, Burlington & Quincy Railroad, girder spans, 1500 tons.

Cleveland Illuminating Co., switch house, 200 tons.

Pumping station, Cleveland, 1000 tons.

Proposed Pig Iron Freight Reductions Are Suspended

WASHINGTON, Sept. 5.—The Interstate Commerce Commission has suspended from Sept. 1 to Dec. 30 tariffs proposing reductions in rates on pig iron from Southern producing points to Northern destinations. Protest had been made against the reductions by blast furnace interests in southern Ohio and the St. Louis district. Protest was also made against the proposed reduced joint rates of the Arrow Transportation Co., to apply from Florence and Sheffield, Ala., to Metropolis, Ill., by Robert Hula on behalf of the Steel & Tube Co. of America and five other iron and steel companies in the Chicago district.

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ESTABLISHED 1855

THE IRON AGE

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Prepare for April 1

Hopes are entertained that the United States Government will establish a "fact finding commission" in connection with the coal industry. If facts are to be secured, an answer to this question should first be sought: "Why does a man go into the coal producing business?" The answer would help to throw light upon the situation. The operators have been insisting that the profits, on the whole, are very moderate, although they manifest an indisposition to give the Government all the details. If profit has not been the attraction, what has? To an outsider the business does not seem to be particularly interesting. Yet it is admitted that there is a great excess of capacity, and indeed this excess is put forth as a justification for a larger margin per ton to the operator than would otherwise be fair.

A similar situation applies to the miners. There are too many miners and they do not work full time. Hence they demand extra high rates per ton, to make up. In the ordinary walks of life a trade or profession that is overcrowded pays poorly. Not so with coal mining. The more crowded it is, the longer are the vacations, with pay, for that is what the high tonnage rates amount to.

Apparently the ordinary economic laws are completely reversed when it comes to coal producing and coal mining. Why? One observes this fact, which may or may not be pertinent, that while the laws of the country forbid producers from combining to restrict output, it has been found that the law does not forbid the coal operators to disagree with the United Mine Workers, while the labor union is always careful to furnish the operators good ground for disagreement.

Coal strikes in the past have represented a guessing contest. Coal consumers endeavor to guess how long the prospective strike will be and lay in stocks accordingly, while the operators and miners endeavor to guess how long the stocks, once laid in, will last.

Now, however, a new condition is presented. The bituminous coal scale has been settled, but only for seven months. There will be no opportunity between now and April 1 to lay in any stocks. Even the current requirements are unlikely to be met. The United Mine Workers have made no secret of the fact that their opposition to arbitration is based upon recognition of the fact that there is no comparison that could be made, with the cost of living, the rates of wages in other occupations, or anything else, that would begin to justify the rates they demand.

Only a brief respite, and a very expensive one, has been provided. If adequate preparation for meeting the situation that will confront the country on the first day of next April is not made, in the short time allowed, a still worse condition will be imposed upon the public.

All possible avenues of escape should be explored. The miners cannot be beaten at their own game. Last March coal went begging at $1.50 a ton in some districts, yet the public did not stock up enough to prevent the miners winning by far the most brilliant victory in the history of labor disputes in this country. The study that is to be made should not lose sight of a detail which in itself is of considerable importance. That is, that the country is decidedly short of the very kind of labor that coal miners can perform. The country is particularly in need of the very workmen who by the existing system are maintained in idleness at public expense for long periods of time.

The Railroad Injunction

Strong adjectives have been used in describing the injunction secured Sept. 1 by the Attorney General against the railroad strikers. The injunction does appear strong and drastic, yet upon scrutiny there are few things enjoined by it that are not illegal in themselves. The event, for this injunction is more than an incident, should prompt some serious reflection.

Injunctions are in vogue largely because court actions, whether criminal or civil, are slow. It having been decided recently by the Supreme Court that labor unions are suable, civil as well as criminal action can be had against conduct that marks the ordinary strike. The slowness of court procedure is a disgrace. While we grow

warm over the liberties taken by strikers, we should remember that there are other things seriously wrong with our management of affairs.

We do not look matters squarely in the face when it comes to labor disputes. We say glibly that no one should think of denying a man's right to quit work. We all know perfectly well that that is no strike. The right to strike, as defined by labor unions, means the right to prevent other men from taking the places union men have left. Whether we admit it to ourselves or not there is a common feeling outside of the unions that strikers ought to be allowed a little more leeway than simply to quit their jobs. Otherwise striking in its familiar form would never have survived to this date. We are not honest in this matter. There seems to be a lurking fear that employers would become too powerful if strikers were not allowed some latitude, were not allowed to break the law in a mild way at least.

If it were established that no act done in connection with a strike is less culpable than a similar act done in some other connection, there would be little need of injunctions in labor disputes and this injunction against the rail strikers would not present the appearance of being "drastic." It is not so established, however. Our habits of thought have led us otherwise, and it is even a part of the laws of the United States that labor unions are in a class by themselves. Section 3 of the Clayton Act says that "it shall be unlawful for any person to lease or make a sale or contract . . . on the condition, agreement or understanding that the lessee or purchaser thereof shall not use or deal in the goods . . . of a competitor." The same principle would prohibit a labor union from making an agreement for the closed shop. This being recognized, Section 6 of the act decreed that labor is not a commodity and made the sweeping provision that nothing in the act or in any of the anti-trust acts should apply to labor unions.

What we need to do is to clean house all around, and we should begin by clearing our minds. We shall get nowhere as long as some men are simply down on all labor unions on general principles and other men have a deep-seated and unrecognized feeling that they ought to be given some latitude. Two wrongs do not make a right. If the way is not clear to require that when a man quits work he must leave the field and forget it, we should either make the way clear or define how much dynamite per day he is entitled to explode in the exercise of his rights as a striker.

River coal has been playing a part in the relief of the fuel stringency. For years fine coal from the anthracite regions has been carried down the Susquehanna and other rivers. Deposits have been left on the beds of these rivers in many places and particularly where dams and obstructions occur. Two Pennsylvania steel companies are daily removing, from one river running by their plants, many tons of this buckwheat anthracite and are using it for making steam. One of the companies makes it a part of its open-hearth furnace charges, as told elsewhere in this issue. Near Baltimore a large metallurgical company, which uses water power for its manufacturing operations, has for some time been selling this grade of coal, removed in large quantities from behind its dam. While the necessity for turning to them may be removed when anthracite production is again ample, these river deposits will probably be drawn upon for some time to come. In a period of scarcity prices for fuel they have saved a number of cost curves from a sharp turn upward.

Saving Fuel in Steel Making

More than ever will fuel economy be a vital question in steel operations in view of the settlement of the miners' strike. For an indefinite time coal is to be more expensive in view of the higher wages at non-union mines, and its advance beyond the pre-war basis is far in excess of that in steel. Reduction of fuel consumption thus becomes of first importance in both blast furnace and open-hearth operations, and particularly in the latter, because progress in the improvement of open-hearth practice, until very recently, has not been so rapid as in the case of the blast furnace.

Several discussions have been published in THE IRON AGE recently, bearing directly on this problem and pointing to more economical fuel efficiency in open-hearth furnaces. One referred to the application of the blow-torch principle. In THE IRON AGE of July 20 the advantages of this process were detailed in an article, "Progress in Open-Hearth Practice." The significant statement was made that at a large steel plant in Ohio a furnace operating on the blow-torch principle has produced approximately 300 tons of high grade basic steel per day against only 200 tons when working under the old conditions. This is an increased efficiency of about 50 per cent. Also important is the statement that 20 per cent scrap was used and 15 per cent hot metal. So far as data go, fuel economies are estimated at 20 to 25 per cent. Contrast with this the author's statement that

> a careful test 10 years ago at the Homestead works of the Carnegie Steel Co., extending over seven to eight months, showed that the losses due to the temperature of the escaping gases, radiation, conduction and other causes amounted to 95.77 per cent of the heat units supplied by the combustion of the incoming fuel. This brings us to the startling conclusion that, if we could eliminate all such losses, there would be only about 20 to 30 pounds of coal required per ton of steel produced.

In addition to increased fuel economy and greater output there are the advantages of more accurate control of fuel and air. A communication to THE IRON AGE of Aug. 3 pointed out that

> it would be economical to inclose the checker chambers in a steel jacket, if only for the saving of heat effected by insulation, letting alone the great possibilities to be obtained by delivery of the gas and air under pressure. . . . Burn your gas in your furnaces and the checkers will take care of themselves.

Furnaces so designed that the fuel is more completely burned over the bath itself are one answer to the fuel cost problem. Refractories to

withstand the consequent higher temperatures are practically assured. Attendant advantages are better steel and the cutting down of the pig iron percentage in the charge.

On other pages of this issue a striking illustration is given of one result of fuel economy. In the production of high grade basic open-hearth steel from all-scrap charges, in the presence of manganese, no small factor is the high temperature resulting from better fuel efficiency in special furnaces, insuring the fullest refining effect of the chemical reactions.

Unquestionably much fuel is wasted in open-hearth furnaces. An abundance of cheap coal, and of natural gas while it lasted, has been one cause. The necessity for radical reforms has been forcibly impressed upon steel makers by recent events. Recently the prediction was made that the transition through which the open-hearth process is passing will so increase the output of existing units as to make the building of new furnaces unnecessary for several years. However that may be, the industry is evidently in the first stages of remarkable improvements which have come all too slowly and to-day meet a need of immediate urgency.

Pig Iron Imports Overstated

July statistics of British and American iron and steel exports, elsewhere in this issue, emphasize the steadiness of the former and the sharp decline in the latter. The British July movement at 251,700 gross tons is about the same as the average per month for the year thus far, while American exports for July at 157,169 tons are next to the lowest for the year. While the coal and rail strikes have been a factor in this reduction, their full effect will be seen in still lower figures for August. A feature of the British statement is the export of 50,700 tons of pig iron and ferro-alloys, of which the United States is credited with 25,560 tons. These figures are not a measure, however, of the pig iron movement to this country as probably half of the total is ferromanganese.

Current statements in various reviews of the Eastern pig iron market have exaggerated greatly the amount of foreign pig iron received in the United States at Atlantic ports. In June, 17,750 tons of pig iron and ferromanganese left Great Britain for the United States. As only 5850 tons of pig iron came into this country in June and only 43,000 tons of pig iron and ferromanganese left Great Britain in June and July, for the United States, it is evident that the statement in a recent pig iron review that in the 90 days preceding Sept. 1 about 100,000 tons of foreign pig iron came in at Atlantic ports and was distributed throughout the East is quite wide of the mark. Making an allowance for French iron, it would have required the clearing of 60,000 to 75,000 tons of pig iron from British ports bound for the United States, in the first week of August, to have August receipts here bring the June and July totals up to anything like 100,000 tons. And it is doubtful if early August clearings were one fourth of 60,000 tons.

CORRESPONDENCE

Interchangeability in the German Locomotives for Russia

To the Editor: In the Aug. 31 issue of your paper, Mr. Wikander says on page 544 apropos of the German industrial standards:

"To give a concrete illustration: At the time of my visit a syndicate of 19 German manufacturers and one Swedish manufacturer were executing an order for 700 locomotives for Russia, all of the same design, and every part in every one of them was being made interchangeable with the corresponding part in all others, all parts having been manufactured to the same fits and tolerances. This feature will have the great advantage of permitting the Russian Railroad to use any disabled locomotive as a store of spare parts for all others."

Mr. Wikander refers evidently to the order of the Russian Soviet Government for 700 locomotives to be made in Germany. The contract of the purchaser with the manufacturer does specify (in paragraph 5) that the parts are to be interchangeable, no matter at which of the works they are made; but the same contract also has a clause (in the same paragraph 5) stating that it is permissible to make these interchangeable parts fit one another by hand operations (filing, scraping, etc.).

It can be readily seen that this latter clause kills entirely the preceding one and the whole idea of interchangeability.

R. POLIAKOFF.

709 Sixth Avenue, New York,
Sept. 1, 1922.

St. Louis Labor Conditions

ST. LOUIS, Sept. 5.—The labor situation in the Eighth Federal Reserve District is reflected in the following table compiled by the Federal Reserve Bank of St. Louis from reports received from 200 leading employers in 20 of the largest cities in the district.

	Wage Earners				Per Cent of	
	Men	Women	Total	Normal	Normal	Pay Roll
July 31, 1922..	112,918	21,150	134,068	155,410	—13.7	$10,274,603.20
June 30, 1922..	109,365	24,217	133,582	157,684	—15.3	9,947,894.52
July 31, 1921..	102,969	19,986	122,955	155,410	—20.9	10,278,307.80

From the above tabulation it will be noted that the number of employees of reportng interests increased 11,113 or 9 per cent (men increased 9.6 per cent, while women increased 5.8 per cent) between July 31, 1921, and July 31, 1922. Wages, figured on a semi-monthly basis, decreased 8.3 per cent between July 31, 1921, and July 31, 1922.

Automobile Production Heavy in August

Figures of the National Automobile Chamber of Commerce estimate the August production of pleasure cars and trucks at 264,000 machines, compared with 244,444 in July and 180,785 in August, 1921. For the first seven months of 1922 the total number of cars produced was 1,395,066. Adding the tentative figure for August, the eight months show 1,659,066 cars, compared with 1,668,550 cars for the twelve months of 1921.

In connection with the railroad strike situation, there has already been some handling of materials overland by truck that would ordinarily travel by rail, and the driving of finished cars overland has increased through lack of automobile freight car supply. Connecticut manufacturers of small tonnage items, including cold-rolled strip steel, are making a heavy proportion of their deliveries by motor truck. This is especially true of some concerns unusually favorably situated geographically, with most of their customers within a circle of 30 miles radius.

Trend of the Safety Movement

Day of Spectacular Accident Reduction Over—Steel Corporation a Pioneer in Safety Work—Meeting of National Safety Congress in Detroit

THAT the day of spectacular accident reduction in large individual groups is practically over, that a progressive though probably slow decline in the severity of accidents may be expected with a clearer view of the engineering factor, and that there will be renewed study of the causes and remedies of fatal accidents as the seriousness of those accidents becomes more evident, were among the prophesies as to the probable trend of the safety movement, made by Lucian W. Chaney, United States Bureau of Labor Statistics, Washington, in a paper read at the eleventh annual safety congress of the National Safety Council, held in Detroit, Aug. 28 to Sept. 1.

The meetings were held at the Cass Technical High School and were attended by about 3000. The Congress received whole hearted support from the city of Detroit. The city had numerous exhibits at the convention headquarters and delegates were welcomed in the industrial plants where safety talks were given.

At the meeting held Thursday afternoon, Aug. 31, the following officers were elected to serve on the National Safety Council for the ensuing year:

President, Marcus A. Dow, general safety agent New York Central Railroad Co.

Vice-president in charge of industrial safety, Charles B. Auel, Westinghouse Electric Co., East Pittsburgh.

Re-elected vice-president in charge of public safety, David Van Schaack, Aetna Life Insurance Co., New York.

Vice-president in charge of sectional activities, George T. Fonda, Fonda & Tolsted, Inc., Washington.

Vice-president in charge of safety councils, L. A. DeBlois, Delaware Safety Council, Wilmington, Del.

Treasurer and chairman of finance committee, Homer Niez, Commonwealth Edison Co., Chicago.

Managing director and secretary, William H. Cameron, Chicago.

Safety in Iron and Steel Plants

Mr. Chaney's paper dealt with the outstanding safety features in the iron and steel industry, the subject being treated under three heads, historical, practical and prophetic.

Individual plants in which standard practice is introduced will still make records in spectacular accident reduction, he said, but as a whole the trend is toward a slow decline, with fluctuations corresponding to the variations of industrial conditions. The great variable in the accident records, he emphasized, is the number of minor injuries, which, when reduced, as they may easily be, would necessarily make further progress slower.

As an illustration of the possibilities of minor injury reduction the case of a large group of plants where a foreman's accident-reduction bonus was instituted was cited. Previously more than 50 per cent of the accidents caused disability of one week or less, and about 25 per cent of the disabilities terminated in the second week. Under the foreman's bonus the minor injuries immediately declined, the number terminating in the first week being finally less in number than those in the second week. This was pointed out as entirely contrary to established opinion, it having been accepted without question that the minor injuries were due to careless habits of the workers, and that they would be difficult to eradicate. Experience proves, he said, that minor injuries are the easiest of all to control.

Decline In Severe Accidents May be Expected

That a progressive though probably slow decline in the severity of accidents may be expected with a clearer view of the importance of the engineering factor, was also prophesied. The serious problem confronting the safety movement is the control of the severer forms of injury, Mr. Chaney stated. Referring to bulletin No. 298 of the Bureau of Labor Statistics in which are charted the severity of accidents in various relations, he pointed out that in almost every instance the black portion is the large and conspicuous element. When the various kinds of accidents are weighted in some reasonable relation to their importance death is shown to be conspicuously the most important. Death is the dark shadow in the field of accident prevention.

Renewed study of the causes and remedies of fatal injuries will come as the relative seriousness of this class of accidents becomes more evident. That the severity rating throws up in true proportions the importance of death, is one of its chief merits, he said. Under ordinary conditions, even in the most haphazard industries, death is comparatively rare and but if judgment is based on this rarity rather than on the seriousness of the occurrence, such judgment is likely to be very much in error.

If the movement is to progress satisfactorily the more thorough study of death cases must result in further reconstructions and rearrangements as radical as any hitherto attempted Mr. Chaney stated.

Steel Corporation a Pioneer in Safety Work

The steps by which the safety movement has advanced, the historical background, were taken up at length by Mr. Chaney. He began with the conference in 1906 of the casualty managers of the Steel Corporation's subsidiary companies, giving as an emphatic reason for the calling of such a conference that American industry reached a climax of slaughter in 1905 and 1906. Regarding the formation by the Steel Corporation in 1908 of the central safety committee and several of its subsidiaries, he said, "the curious inquirer can doubtless find scattered instances of similar organizations in other fields, but the committee system as an important feature of the accident prevention program began with these organizations and has contributed more largely than any other single feature of that program to its present degree of success."

The establishment of compensation plans by the Steel Corporation early in the development of safety effort was characterized as of utmost importance, every personal injury then becoming a potentional cost item and instead of looking for defenses against a possible suit, casualty managers began to look into the causes of accidents and a way to prevent them.

The interest of the Association of Iron and Steel Electrical Engineers, the advent of the first safety congress in 1912, and the establishment of statistical data by the U. S. Bureau of Labor Statistics were outlined.

"Historically the iron and steel industry has made five outstanding contributions to the safety movement," said Mr. Chaney in concluding this phase of his subject. "The industry represented by the Steel Corporation initiated the movement and established the committee system. It made the first large trial of compensation. Through the Association of Iron and Steel Electrical Engineers it laid the foundation of the National Safety Council. It has directed attention in a new way to the importance of the engineering factor in accident prevention."

In discussing what have been the practical results of the safety movement, Mr. Chaney pointed out that the ordinary expression of success, such-and-such percentages of decreased accident occurrence, are apt to be misleading. Nothing is more striking he said than the decline of minor injuries which can be secured by certain kinds of appeal to the men. They respond remarkably, and to outward appearance success has been very great. Closer analysis, however, may show the old stubborn difficulties scarcely touched. Only by maintaining a continuous record for a considerable period and massing a sufficient body of data is it possible to secure dependable results, he emphasized.

Iron and Steel Markets

SOME GAIN IN OUTPUT

August Low Point in Pig Iron—Furnaces and Steel Plants Resuming

Promise of Rail Buying at Chicago — The Strike Factor in Finished Steel Prices

Steel works are now gaining in output, after touching low point in the last week of August. The increase is not large as yet, but it promises to be greater next week. The betterment in the railroad situation is not marked, and after being down below 50 per cent the industry is satisfied for the present to aim at a 60 per cent operation.

Pig iron output went down rapidly for most of the second half of August. For the month the total was 1,816,170 tons, or 58,586 tons a day, against 2,405,365 tons in July, or 77,592 tons a day. The net loss in active furnaces in the month was 28 and the daily capacity of the 144 furnaces in blast September 1 was 54,645 tons, against 70,605 tons a day for 172 furnaces on August 1.

The upward turn in the few days since the opening of the month has already brought back nine furnaces to the active list—five in Pennsylvania, including three in the Pittsburgh district, three at Youngstown, and one at Cleveland. From half a dozen to a dozen more are preparing to go in in the next ten days.

A gain, but not a large one, has been made in Connellsville coke output, as the non-union men are still holding out, but for some time increase in steel production will come faster than that in pig iron production. Merchant companies whose blast furnaces are out must make wage adjustments and besides must get cheaper coke before they can start up to make deliveries on contracts taken much below to-day's prices.

Steel companies are unable to get sufficient box cars for the movement of products like wire and tin plate and this shortage promises to be worse. The use of open top cars for coal movement is also curtailing the supply of such cars for steel mills. Still overhanging the industry is the cloud of common labor shortage. In respect to railroad equipment what has been called a car shortage is more truly motive power trouble.

Consumers of steel in a number of lines are showing more concern over their ability to secure continuous supplies from the mills. However, the strike factor in the higher prices the mills are now asking prevents any large business on this basis and the general belief is that deliveries will grow easier even though progress in that direction be but slow.

The Chicago district as the largest railroad buying center, gives more definite promises than any other in respect to future demand. It reports that orders for 300,000 tons of rails for next year await only the naming of the 1923 price; also that there is new interest in railroad bridge material. There is increased buying of track fastenings at Chicago, one order calling for 15,000 tons of tie plates.

Locomotive buying continues on a large scale, orders for 238 being entered in the week, including 100 for the Pennsylvania and 50 each for the Chicago & Northwestern and the Missouri Pacific. Car orders are not numerous, but there are inquiries for about 5000 new cars and repairs for 1500 to 2000.

Independent sheet companies still average a better operation than the Steel Corporation, the figures being 80 per cent and 60 per cent. Generally they are asking $2 to $3 a ton more than the corporation's prices. There is practically no suspension of shipments of automobile sheets. In tin plates there have been intimations of an advance beyond $4.75 in view of increased steel costs.

The price of Southern pig iron has advanced $2 and $25, Birmingham, is now the prevailing quotation, but the shipment of iron to the North has almost entirely ceased on account of the railroad congestion. In the North, shipments show improvement in most centers. Prices at Chicago and in the East have advanced $2 on most grades. Foreign iron is being sold in moderate tonnages with a tendency of prices to advance. It is not easy to buy abroad for delivery before November, but a considerable tonnage has been shipped or is in the hands of importers, though the total of arrivals thus far has been much overstated.

Iron and steel exports dropped to 157,000 tons in July, or 26 per cent below the June total, and August figures are expected to show further recession.

Finished steel, according to THE IRON AGE composite price, remains at 2.412c. per lb., as for the last two weeks. This compares with 2.279c. one year ago and 2.062c. on Jan. 1.

Pig iron has advanced, THE IRON AGE composite price having risen from $29.52 to $30.52, the highest since Jan. 25, 1921. The price one year ago was $19.64; on Jan. 1 it was $18.68.

Pittsburgh

Settlement of Coal Strike Brings Moderate Improvement in Steel Plant Operations

PITTSBURGH, Sept. 5.—From an operating standpoint, the iron and steel industry in the past week has begun to show definite betterment as a result of the recent settlement of the coal strike, although this settlement appears to be confined to the union districts and the non-union production has not shown expected gains. The Jones & Laughlin Steel Co., since the resumption at its mines Aug. 28, has turned on the blast at two of its Eliza blast furnaces and one Aliquippa stack, which were banked when the pinch in coal supply became acute in July. The Youngstown Sheet & Tube Co. has put on two blast furnaces since a week ago and the Brier Hill Steel Co. and the Sharon Steel Hoop Co. each one. The Carnegie Steel Co. also has added one furnace to its active list and with the furnace of the Shenango Furnace Co., which started Aug. 29, there are now 58 active furnaces in the district bounded by Johnstown, Pa., on the East, Wheeling, W. Va., on the South, and Warren, Ohio, on the North. This is a gain of eight stacks in about 10 days and several others, chiefly steel works furnaces, are being made ready to start. In-

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Sept. 5, 1922	Aug. 29, 1922	Aug. 8, 1922	Sept. 6, 1921
No. 2X, Philadelphia†	**$36.14**	$34.14	$31.14	$20.84
No. 2, Valley furnace†	**35.00**	33.00	29.00	21.00
No. 2, Southern, Cin'ti†	**29.05**	27.05	24.05	23.50
No. 2, Birmingham, Ala.†	**25.00**	23.00	19.50	19.00
No. 2 foundry, Chicago*	**32.00**	30.00	27.00	21.00
Basic, del'd, eastern Pa.	**32.00**	28.64	27.25	19.00
Basic, Valley furnace	30.00	30.00	26.00	19.00
Valley Bess., del. Pitts.	**34.77**	33.77	28.76	21.96
Malleable, Chicago*	**32.00**	30.00	27.00	21.00
Malleable, Valley	33.00	33.00	28.00	20.00
Gray forge, Pittsburgh	34.76	34.76	28.76	21.96
L. S. charcoal, Chicago	36.15	36.15	33.15	33.50
Ferromanganese, seaboard	67.50	67.50	67.50	70.00

Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$40.00	$40.00	$40.00	$47.00
Bess. billets, Pittsburgh	38.00	38.00	35.00	29.00
O.-h. billets, Pittsburgh	38.00	38.00	35.00	29.00
O.-h. sheet bars, P'gh	**40.00**	38.00	35.00	30.00
Forging billets, base, P'gh	43.00	43.00	40.00	34.00
O.-h. billets, Phila.	45.17	45.17	42.67	35.74
Wire rods, Pittsburgh	45.00	45.00	40.00	38.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	2.00	2.00	1.80	1.70
Light rails at mill	2.00	2.00	1.75	1.75

Finished Iron and Steel, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	**2.42**	2.325	2.025	2.00
Iron bars, Chicago	2.25	2.25	2.00	1.75
Steel bars, Pittsburgh	2.00	2.00	1.80	1.65
Steel bars, Chicago	*2.10*	2.35	1.90	1.85
Steel bars, New York	2.34	2.34	2.14	2.03
Tank plates, Pittsburgh	2.00	2.00	1.80	1.70
Tank plates, Chicago	**2.30**	2.20	1.90	1.75
Tank plates, New York	2.34	2.34	2.14	2.08
Beams, Pittsburgh	2.00	2.00	1.80	1.70
Beams, Chicago	*2.20*	2.35	1.90	1.80
Beams, New York	2.34	2.34	2.14	2.08
Steel hoops, Pittsburgh	2.75	2.75	2.50	2.25

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire, *Per Lb. to Large Buyers:*	Sept. 5, 1922 Cents	Aug. 29, 1922 Cents	Aug. 8, 1922 Cents	Sept. 6, 1921 Cents
Sheets, black, No. 28 P'gh	3.35	3.35	3.15	2.75
Sheets, galv., No. 28, P'gh	4.35	4.35	4.15	3.75
Sheets, blue an'l'd, 9 & 10	2.50	2.50	2.40	2.25
Wire nails, Pittsburgh	2.60	2.60	2.40	2.75
Plain wire, Pittsburgh	2.35	2.35	2.25	2.50
Barbed wire, galv., P'gh	3.15	3.15	3.05	3.40
Tin plate, 100-lb. box, P'gh	$4.75	$4.75	$4.75	$5.25

Old Material, Per Gross Ton:				
Carwheels, Chicago	$22.50	$22.50	$19.50	$13.75
Carwheels, Philadelphia	**20.00**	19.00	17.50	17.00
Heavy steel scrap, P'gh	18.50	18.50	17.50	13.00
Heavy steel scrap, Phila.	15.50	15.50	15.00	11.50
Heavy steel scrap, Ch'go.	**17.50**	17.00	15.50	11.00
No. 1 cast, Pittsburgh	19.00	19.00	19.00	16.50
No. 1 cast, Philadelphia	19.00	19.00	18.00	17.00
No. 1 cast, Ch'go (net ton)	**21.50**	20.00	18.00	13.25
No. 1 RR. wrot, Phila.	18.50	18.50	17.50	14.50
No. 1 RR. wrot, Ch'go (net)	**17.50**	15.50	14.25	11.50

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$10.00	$10.00	$14.00	$3.00
Foundry coke, prompt	12.00	12.00	15.00	4.00

Metals, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Lake copper, New York	14.12½	14.12½	14.12½	12.00
Electrolytic copper, refinery	13.75	13.75	13.75	11.75
Zinc, St. Louis	6.25	6.25	6.30	4.20
Zinc, New York	6.60	6.60	6.65	4.70
Lead, St. Louis	5.55	5.55	5.50	4.20
Lead, New York	5.90	5.90	5.85	4.70
Tin (Straits), New York	**32.50**	32.30	32.62½	27.25
Antimony (Asiatic), N. Y.	**5.37½**	5.25	5.25	4.50

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price, Sept. 5, 1922, Finished Steel, 2.412c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 83 per cent of the United States output of finished steel

Aug. 29, 1922	2.412c.
Aug. 8, 1922,	2.212c.
Sept. 6, 1921,	2.279c.
10-year pre-war average,	1.689c.

Composite Price, Sept. 5, 1922, Pig Iron, $30.52 Per Gross Ton

Based on average basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

Aug. 29, 1922,	$29.52
Aug. 8, 1922,	25.94
Sept. 6, 1921,	19.64
10-year pre-war average,	15.72

crease in blast furnace operations has been attended by some gain in steel works operations. The Carnegie Steel Co. this week is expected to get out close to 60 per cent of its capacity of ingots, as against about 55 per cent last week while in Youngstown active open hearth furnaces have increased in number from 30 to 42. There has as yet been little change in operating conditions in the Wheeling district plants.

Permanence of the upward slant of operations still is a matter of doubt, however, for while production of coal in Western Pennsylvania and Northern West Virginia, as measured by railroad reports of loadings, is above 75 per cent of normal capacity, transportation conditions already are affecting shipments and the trade also fears that the application of the priority system of distribution may affect supplies. There is much talk of car shortages, but as yet such a condition does not exist. The trouble is with the motive power. Car shortages are expected, when the troubles incident to the opening of mines long idle are ironed out and there is a relatively full production of coal. A number of the steel companies are finding it hard to get a sufficient allotment of box cars for the movement of such products as wire and tin plate and this shortage is likely to be worse before it is better, with the crop movement immediately ahead while demands for open top cars for coal movements will mean a curtailment in the supply of that kind of equipment for the steel mills. Hanging like a cloud over the industry is the continued shortage of mill labor. Following the increase in plant operations a large Pittsburgh independent has re-entered the market in a moderate way for new tonnages of plates and bars for early delivery, but as a general proposition, the situation as far as prompt shipments are concerned is not yet materially easier.

Pig Iron.—Such business as is being done—and it is entirely for small lots for immediate delivery—is confined very largely to foundry iron. We note sales of Bessemer iron amounting to 700 tons, but a recent inquiry for 2000 tons of basic iron from a local melter has been withdrawn and there have been no new inquiries of any account lately in these grades. Prices

quoted on the 2000-ton inquiry for basic ranged anywhere from a little above $32 delivered, this being by an Eastern steel company, to $32, Valley furnace basis. Bessemer iron on the basis of recent sales now is quotable at $33 Valley furnace, an advance of $1 a ton over last week's prices. In absence of sales, basic iron still is nominally rated at from $30 to $32. The N. & G. Taylor Co., Cumberland, Md., which recently inquired for 2500 tons of basic, is understood to have placed the business in the East. It is interesting to note, in face of current prices for Valley basic and Bessemer iron, that the August averages of W. P. Snyder & Co. on these grades were $28.67 for Bessemer and $25.41 for basic. Evidently little of the month's business was at the prices reached late in the month. July averages were $25 for Bessemer and $24.56 for basic. On the basis of late sales of foundry iron, the market now is quotable at $35 Valley furnace, an advance of $2 a ton over the recent price. The whole market is on a spot basis and not very representative of the price of forward deliveries. Until coke prices are definitely settled, producers will be in the dark as to costs; consequently they are not making prices on future shipments, but it also is true that few melters are interested at the moment in future requirements.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$30.00 to $32.00
Bessemer	33.00
Gray forge	33.00
No. 2 foundry	35.00
No. 3 foundry	33.00
Malleable	33.00

Ferroalloys.—New schedules have been announced on silveries and Bessemer ferrosilicon by one Jackson, Ohio, producer, who now is quoting 8 per cent silveries at $41.50 and 10 per cent Bessemer ferrosilicon at $50.50. This is an advance of $5.50 a ton over recent nominal quotations and $9 over the last previous official prices. Other ferroalloy prices are unchanged. British ferromanganese still is available for deferred shipment at $67.50 c.i.f. Atlantic seaboard, but spot material has sold recently at $70 and is held at $72.50 by some sellers. Domestic material is available for prompt delivery at $75, c.i.f. Atlantic seaboard, for carload lots. An Ohio maker of alloy steels is seeking a round tonnage of 80 per cent material. Spiegeleisen is held at $39 furnace for 20 per cent, but we note no sales that high, most recent business having been at least $1 per ton less.

We quote 78 to 82 per cent ferromanganese, $75 c.i.f. Atlantic seaboard for domestic; British, spot, $70 to $72.50; British, future, $67.50; German, 76 to 80 per cent, $67.50 to $70. Average 20 per cent spiegeleisen, $39 furnace; 16 to 19 per cent, $38 furnace; 50 per cent ferrosilicon, domestic, $55 to $60 furnace, freight allowed. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, $50.50; 11 per cent, $53.80; 12 per cent, $57.10; 13 per cent, $61.10; 14 per cent, $64.10; silvery iron, 6 per cent, $39; 7 per cent, $40; 8 per cent, $41.50; 9 per cent, $43.50; 10 per cent, $45.50; 11 per cent, $48.80; 12 per cent, $52.10. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $3.66 per gross ton.

Iron and Steel Bars.—The general range of prices on steel bars is from 1.90c. to 2.25c., the lower figure representing about what the Steel Corporation is charging regular customers on such business as it can take, and this for indefinite delivery and the higher prices what some independents are demanding for early delivery. The leading independent maker here is quoting from 2c. to 2.15c. Iron bars are higher, now being quotable at 2.45c. for refined iron.

We quote steel bars rolled from billets at 1.90c. to 2.25c.; reinforcing bars, rolled from billets, 1.90c. to 2.25c. base; rail steel reinforcing bars, 1.90c. to 2c.; refined iron bars, 2.45c. in carloads, f.o.b. mill, Pittsburgh.

Billets, Sheet Bars and Slabs.—The present market is a small affair, because makers generally are more inclined to let the material go to their own finishing mills than to sell, and are asking prices which are intended to, and in fact do, discourage purchases. Some mills having more billets than can be rolled down on account of labor shortages, might take a little business at $38, Pittsburgh, but as a general rule, $40 is as low as is being named on either billets or sheet bars and on slabs the same price is asked.

We quote 4 x 4-in. soft Bessemer and open-hearth billets at $38 to $40; 2 x 2-in. billets, $40; Bessemer and open-hearth sheet bars, $40; slabs, $40; forging billets, ordinary carbons, $43 to $45, all f.o.b. Youngstown or Pittsburgh mills.

Cold-Finished Steel Bars and Shafting.—In keeping with the strength of hot-rolled bars and the difficulty which makers of cold-finished bars are having in securing supplies, prices of the latter product have been advanced $5 per ton. All makers of cold-rolled, drawn and turned bars now are quoting 2.50c, base, Pittsburgh, per carload, while ground shafting has advanced to 2.90c. base, f.o.b. mill, for carloads. The less than carload price is $5 per ton more.

Hot-Rolled Flats.—The market is firm on the basis of 2.75c., Pittsburgh, with makers as heavily committed as they care to be and not anxious to add to their obligations.

Bolts and Nuts.—Leading makers have announced an increase in prices averaging about 10 per cent. Large machine bolts now are quoted at 50, 10 and 10 per cent off list. This change reflects the strength and security in raw materials, although increased labor costs also are a factor. Demand, independent of specifications on third quarter contracts, is reported to be good. New discounts are given on page 627.

Rivets.—There has been a further revision upward of prices and all makers now are quoting large button head structural rivets at $3, base, per 100 lb., Pittsburgh, and large cone head boiler rivets at $3.10. Small rivets have been advanced to 65 and 5 per cent off list. It is claimed that rivets cannot be made profitably even at these prices with steel bars at 2c. to 2.15c. base and wire rods at $45 per ton. Prices and discounts are given on page 627.

Structural Material.—The situation with regard to deliveries still is bad, but some encouragement is afforded by the fact that the Jones & Laughlin Steel Co. is benefiting by the improved fuel situation, and because the Homestead Works, Carnegie Steel Co., is on a higher operating rate as to both steel works and rolling mills. Prompt shipments are not easy to secure, except at high prices, but on the bulk of current inquiries the quotation is right around 2c. Prices are given on page 627.

Plates.—The leading independent here has reentered the market in a moderate way, quoting a minimum of 2.25c. This appears to be as low as early deliveries can be placed and some independents are asking 2.50c. for prompt shipment. The Steel Corporation price nominally is 2c. on such business as it can take and this strictly from its regular customers. Prices are given on page 627.

Sheets.—Independent companies still are making a better showing as regard operations than the leading interest. The latter is running less than 60 per cent while the independents are averaging about 80 per cent. Some of the independents are quoting the Corporation sheet prices, but most of them are asking $2 to $3 a ton above these levels and even more when quick shipment is wanted. Specifications are coming along freely and much new business is being passed up because of the fear that conditions may not be as good with regard to operation as they now promise to be. Labor shortages are common. Automobile parts manufacturers still are urging shipments on contracts and among sheet makers the general belief is that the Ford suspension will not be as complete as was announced by Mr. Ford recently. Prices are given on page 627.

Tin Plate.—Demand is fairly brisk, but is putting no strain upon production and prices show no change. The movement toward an advance to a base of $5 has not crystallized, but it is still talked about on account of increased producing costs. Stock tin plate is available at $4.50 per base box.

Steel Skelp.—Available tonnages are so small that business necessarily is limited. It is doubtful whether independent makers would consider less than 2.50c. and some probably would ask 2.50c. So far as it is able, the Corporation is taking business at 2c.

Track Equipment.—There has been no further change in spikes, but track bolts have advanced to a minimum of $3.75, base, per 100 lb. Pittsburgh. As high as $4.50 is quoted by some makers, but these makers for some time past have not charged the usual extra of 1c. per lb. over the carload base for less car-

loads. On carload lots of a size $3.75 still can be done. The general quotation on tie plates is $45 per net ton, the most recent business was 400 tons placed by Pennsylvania Railroad with a local maker at $39 per net ton. Prices are given on page 627.

Steel Rails.—Shortage of steel makes for a firm market, with light rails rolled from new steel not available at less than 2c., and some makers are asking 2.25c. on shipments from stock. Those rolled from old rails are priced at 1.90c. to 2c.

We quote 25 to 45-lb. sections, rolled from new steel, 2c. base; rolled from old rails, 1.90c. to 2c. base; standard rails, $40 per gross ton mill for Bessemer and open-hearth sections.

Iron and Steel Pipe.—The general situation is without material change. All makers of steel pipe still are about 90 days behind their orders for butt welded pipe, but on the lap welded lines are not nearly so heavily committed. A recent inquiry for 30 miles of 8-in., 29-lb. line pipe has been withdrawn, as the company seeking this line was able to pick up a good second-hand line. Wrought iron pipe is not selling freely at the recent advance in prices. Discounts are given on page 627.

Boiler Tubes.—Liberal orders recently placed for locomotives point to continue good demand for boiler tubes, particularly for seamless steel tubes. The recent advance in prices is well observed on new business. Discounts are given on page 627.

Wire Rods.—Available supplies are confined solely to such tonnages as makers are unable to use in their own mills, owing to a shortage of wire drawers. One company here which has a small surplus as a result of this condition is offering it at $47.50 base, Pittsburgh. This price has not yet been obtained, but it is doubtful whether supplies can be had at any less since most other makers still are out of the market.

We quote No. 5 common basic or Bessemer rods to domestic consumers, $45 to $47.50; chain rods, $45 to $47.50; screw stock rods, $50 to $52.50; rivet and bolt rods and other rods of that character, $45 to $47.50; high carbon rods, $52 to $57.50, depending on carbon, per gross ton, f.o.b. Pittsburgh or Youngstown.

Wire Products.—Buyers still are finding it difficult to enter orders for early delivery and quite as difficult to interest manufacturers in fourth quarter business. This condition is explained by the fact that practically all producers have obligations which will tax productive capacity for some time to come, owing to labor shortages while lately a scarcity of box cars has been backing up shipments. These manufacturers remain out of the market and the one company which has not formally withdrawn is not accepting business in excess of the regular requirements of its customers. A further advance in prices is probable because it is claimed that present prices do not allow a fair profit in view of the recent wage increase. Some companies state that when they come back into the market, it will be on a basis of $2.75 per keg for nails and $2.50 per 100 lb. for plain wire. The advance in wire products from the low point has been small by comparison with that in other steel products, but it is also a fact that wire products did not sustain as heavy a drop from the 1921 peak prices as did the other products. Prices are given on page 627.

Cold-Rolled Strips.—Demand holds good in the face of the recent advance, chiefly because the automobile makers are heavily committed and are getting few, if any, cancellations. For fourth quarter shipment, which is about as promptly as makers now can make deliveries, the market is at 4.25c., base Pittsburgh.

Coke and Coal.—Bee Hive oven coke production is not increasing much because many miners and oven operatives in the Connellsville district still are holding out for recognition of the union as a condition of their return to work. It is doubtful whether any of the operators is getting much in excess of 50 per cent production and many are well below that rate. Prices are unchanged with furnace grade quotable from $10 to $11 per ton at ovens based on sales to blast furnaces while foundry fuel commands anywhere from $12 to $14, depending on quality. It is reported that furnace coke has been sold to replace anthracite coal at $11 to $12 but that is well above what furnace operators lately have paid or will pay at today's prices of pig iron. The coal market is soft and hardly quotable above $5 per net ton at mines. We note sales of several large lots of gas coal at that figure. Production of coal in this district is gaining more rapidly than the demand and priority distribution rules are not yet very effective.

Old Material.—Dealers, confident that much higher prices are immediately ahead and that the railroads will not be in position to press material upon the market, are bidding high against railroad scrap lists. The steel scrap offered by the Pennsylvania Railroad, Central Region, sold at $17.25 to $17.30 per net ton, or $19.32 to $19.37 per gross ton, almost $1 per ton above the highest price paid or offered by any of the steel companies in this district, and almost $2 per ton above what one large Pittsburgh independent is bidding. So far, mills in this district have not increased their price ideas, but Youngstown and Canton are taking on tonnages at higher prices than prevail here and with the market also stronger East, it is hard to figure how Pittsburgh mills can escape paying the advance. Another argument in favor of higher prices is the unusually big premium on pig iron over scrap iron. The Pennsylvania Railroad, Central Region, list contained 5800 net tons, the Southwestern Region list 1900 net tons and the Eastern Region list approximately 19,000 net tons. A good many cast iron car wheels lately have been bought for Warren, Ohio, delivery, at $22 per gross ton delivered.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

	Per Gross Ton
Heavy melting steel, railroad or equivalent	$18.50
Heavy melting steel, ordinary	17.50
No. 1 cast, cupola size	$19.00 to 19.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va.; Franklin, and Williamsport, Pa.	18.50 to 19.00
Compressed sheet steel	16.50
Bundled sheet sides and ends	15.50
Railroad knuckles and couplers	19.00 to 19.50
Railroad coil and leaf springs	19.00 to 19.50
Low phosphorus standard bloom and billet ends	23.00 to 24.00
Low phosphorus, plates and other grades	21.00 to 22.00
Railroad malleable	17.00 to 17.50
Iron car axles	27.00 to 28.00
Locomotive axles, steel	25.00 to 26.00
Steel car axles	20.00 to 20.50
Cast iron wheels	21.50 to 22.00
Rolled steel wheels	20.00 to 21.00
Machine shop turnings	14.50 to 15.00
Heavy steel axle turnings	16.50 to 17.00
Short shoveling turnings	16.00 to 16.50
Cast iron borings	17.00 to 17.50
Heavy breakable cast	18.50 to 19.00
Stove plate	15.50 to 16.00
Sheet bar crop ends	23.00 to 23.50
No. 1 railroad wrought	16.00 to 16.50

Judge Gary Returns—Expresses Optimistic Views on Conditions

Judge Elbert H. Gary, chairman United States Steel Corporation, accompanied by Mrs. Gary, returned to New York Thursday after a pleasant sojourn of about a month at Colorado Springs, Col. He was interviewed at Chicago last Wednesday and took an optimistic view of business conditions. He said that throughout the West there seemed to be a general feeling that business activities were increasing and that great prosperity would be witnessed whenever conditions relating to transportation and production would permit. "I think," he said, "there is still a great deal of profiteering in business, such as in building materials and in some trades as well." He said he looked upon the reported action of the Ford Motor Co. as simply a protest against paying extortionate prices.

"For the last two years at least," said Judge Gary, "the people of this country in increasing numbers have withheld purchases to supply their necessities because of the unconscionable selling prices which have been demanded. The inexorable law of supply and demand ultimately will bring about adjustments concerning prices and remuneration which are just and equitable. There is nothing the matter with this country. Opportunities here are greater than ever before. The fault is in individuals.

"It behooves every one of us to make certain we are doing the right thing up to the limit of our intelligence and moral courage."

Chicago

Railroad Buying Gives Promise of Much Activity—Pig Iron Prices Higher

CHICAGO, Sept. 5.—The undiminished buoyancy of business after months of strike conditions has strengthened the faith of the trade in the future. Purchases of steel for indefinite delivery are slightly above the average for August and for an important local mill that month was an improvement over July in orders booked. With the market so active under handicaps, it is felt that now that the coal mines are producing again, the only remaining step necessary to usher in a sustained period of heavy buying is a settlement of the shopmen's strike. Even now the railroads are indicating that their purchases this fall will be very liberal. One line has placed 9000 tons of plates, shapes and bars to be used on car repairs and other roads are preparing to buy material for the same purpose. Orders for 300,000 tons of rails for next year await only the announcement of the 1923 mill prices. Purchases of track fastenings are in increasing volume, one order alone calling for 15,000 tons of tie plates. Renewed interest is also manifested in bridge material. Whereas, the carriers rarely place large orders for bridge steel except at the beginning of the year, one large road has entered the market for 1500 tons of girder spans to be used at 25 different locations.

Prices for indefinite shipment remain unchanged, but the market level on material for specified delivery has clarified with the appearance of quotations of 2.10c., Chicago, on soft steel bars, 2.25c., Chicago, on structural shapes and 2.30c., Chicago, on tank plates. The advance in bolts and nuts forecast a week ago amounts to approximately 10 per cent.

The operating situation in this district is unaltered, but the next change will probably be for the better. Fresh supplies of coal, however, are arriving very slowly and steel works are conserving their stocks by using oil for operations to which it is adapted.

Ferroalloys.—The market is quiet in all of the ferroalloys. Prices are unchanged, although owing to the increasing difficulty of getting rail shipments through from New Orleans, some recent consignments of ferromanganese have been handled through Baltimore.

We quote 78 to 82 per cent ferromanganese, future, $75.06; prompt, $82.56, delivered; 50 per cent ferrosilicon, $55 delivered on contract and $57 prompt delivery; spiegeleisen, 18 to 22 per cent, $47 to $49, delivered.

Pig Iron.—Local iron has again advanced, this time to $32, base furnace. Inquiry for forward delivery has fallen off, as is generally the case immediately after an advance, but demand for spot iron is unabated. Among current inquiries for prompt delivery is one for 500 tons of malleable. Local producers are being subjected to increasing pressure for iron by consumers in other territories where blast furnace output has practically ceased and furnace stocks have been exhausted. Because of the desperate situation in those sections, a number of small tonnages have been sold for shipment from Chicago district stacks, the freight from Chicago to certain destinations in Ohio running up to over $4.25 a ton. The heavy sales of foreign pig iron in the East have given rise to speculation whether local prices will advance sufficiently above the present level to bring European competition into this district. There have been several occasions within the memory of the local trade when shipments of British iron have reached Chicago. Southern competition is temporarily at least practically non-existent because of the railroad embargoes which block shipments from the furnaces to points in this territory. Southern quotations, however, are stiffer, $25 base, Birmingham, being the minimum with a dollar differential for each added 0.50 per cent of silicon. A sale of 250 tons of charcoal for third and fourth quarter shipments has been made at $33 base furnace. In view of the fact that local coke iron is now up to $32, furnace, another advance in charcoal is looked for. Low phosphorous iron is in an exceedingly strong position because of lack of production and rapid depletion of furnace stocks. An inquiry for 500 tons of low phosphorous for delivery within 60 days is before the trade. Silvery is in a similar position, and while one furnace is still quoting $37.50 f. o. b. Jackson on 8 per cent, all sales subject to confirmation, another Jackson County furnace is quoting $4 higher.

Quotations on Northern foundry, high phosphorus malleable and basic irons are f.o.b. local furnace and do not include a switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards, or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$36.15
Northern coke, No. 1, sil. 2.25 to 2.75	33.00
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	32.00
Northern high phos	32.00
Southern No. 2	$31.00 to 32.00
Malleable, not over 2.25 sil	32.00
Basic	32.00
Low phos., Valley furnace, sil. 1 to 2 per cent copper free	38.00
Silvery, sil. 8 per cent	42.29

Plates.—Buying of railroad cars and oil storage tanks has fallen off for the time being, but demand on the mills for plates is still heavy. The railroads are expected to place liberal orders for steel this fall for car repairs. One road alone recently closed for 9000 tons of plates, shapes and bars to be used for the rehabilitation of equipment. For indefinite delivery the minimum quotation on tank plates remains 2.05c., Chicago, while for relatively early shipment the best local price is 2.30c. The leading independent is allocating its fourth quarter tonnage and is accepting no orders unaccompanied by specifications.

The mill quotation is 2.05c. to 2.50c., Chicago. Jobbers quote 2.90c. for plates out of stock.

Cast Iron Pipe.—La Porte, Ind., will open bids on 1750 tons of 18-in. Class C pipe on Sept. 11. Eloise, Mich., has taken tenders on 1230 tons of 12-in., but has not yet made an award. Detroit, likewise, has failed to make a decision on 800 tons on which bids were taken three weeks ago. The explanation appears to lie in the fact that pipe shops are unable to give the deliveries desired. Hinsdale, Ill., will soon take bids on 585 tons of 12-in. and 10-in. While most makers are now firm on a base of $40, Birmingham, for 6-in. and larger, at least one pipe producer is still quoting $38.50.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $50.70 to $52.20; 6-in. and above, $46.70 to $48.20; class A and gas pipe, $3 extra.

Wire Products.—Demand is heavy for all forms of wire products, not excepting barbed wire. Two large orders for the latter material from the Northwest are apparently in anticipation of fall fencing work. Mill operations have not improved. For mill prices, see Finished Iron and Steel, f.o.b. Pittsburgh, page 627.

We quote warehouse prices, f.o.b. Chicago: No. 9 and heavier black annealed wire and No. 9 and heavier bright basic wire, $3.20 per 100 lb.; common wire nails, $3.35 per 100 lb.; cement coated nails, $2.75 per keg.

Bolts and Nuts.—Following advances in raw material, bolt, nut and rivet makers have increased their prices approximately 10 per cent. New discounts as announced up to date will be found on page 627, but the basing point is Chicago.

No changes have been announced in the discounts of plow bolts and stove bolts and it is probable that they will remain the same. Prices are f.o.b. Chicago. Buyers are specifying heavily against their contracts to get the benefit of the lower prices. At the same time new business is being closed at the revised figures.

Jobbers quote structural rivets, 3.50c.; boiler rivets, 3.60c.; machine bolts up to ¾ x 4 in., 50, 10 and 10 per cent off; larger sizes, 50 and 10 off; carriage bolts up to ⅞ x 6 in., 50 and 5 off; larger sizes, 45 off; hot pressed nuts, squares and hexagons, tapped, $3.25 off; blank nuts, $3.50 off; coach or lag screws, gimlet points, square heads, 60 per cent off; quantity extras are unchanged.

Reinforcing Bars.—Sellers continue to accept orders cautiously although they are being pressed to take a multiplicity of small tonnages. At the same time new projects of more than 100 tons are fewer. Awards include:

Nurses' home, Chicago, Wm. Carnegie, general contractor, 100 tons to Paul J. Kalman Co.

School, Mankato, Minn., 180 tons to Concrete Steel Co.

Neely Printing Co. plant, Chicago, 100 tons to Corrugated Bar Co.

Pending work includes:

Hanes Hotel, Chicago, 225 tons.

Sheets.—The Inland Steel Co. has opened its books for fourth quarter at the same prices as were previously announced by the leading producer. Tonnage will be allocated among customers. Demand is insistent and is coming from all parts of the country as well as from abroad, indicating a pronounced scarcity of material.

Mill quotations are 3.35c. to 3.50c. for No. 28 black, 2.50c. to 2.60c. for No 10 blue annealed and 4.35c. to 4.50c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote blue annealed, 4c.; black, 4.85c.; galvanized, 5.85c.

Bars.—Demand for soft steel bars continues heavy, with 1.95c., Chicago, the minimum price for indefinite shipment and 2.10c., Chicago, the best quotation on material for specific delivery. As high as 2.50c., Chicago, is being paid for prompt shipment. Demand for bar iron is not so active, but prices are firm at a minimum of 2.25c., Chicago, with some business going at as high as 2.50c., Chicago. Buying of hard steel bars is sustained, although not spectacular, and prices are unchanged.

Mill prices are: Mild steel bars, 1.95c. to 2.50c., Chicago; common bar iron, 2.25c. to 2.50c., Chicago; rail steel, 2c. to 2.005c., Chicago.

Jobbers quote 2.80c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.80c. for rounds and 4.30c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 2.50c. base; hoops, 3.90c.; bands, 3.55c.

Rails and Track Supplies.—Fully 300,000 tons of rails for 1923 delivery will be placed as soon as a price for next year is announced. Of this tonnage, from 125,000 to 200,000 tons will be placed by the New York Central. Other pending lots include two of 40,000 tons each, one of 20,000 tons, one of 10,000 tons and another of 6000 tons. Track fastening business is in satisfactory volume. A single order for 15,000 tons of tie plates is the largest placed in this district for a considerable period, if not the largest on record. There has been a marked improvement in inquiry for light rails since the settlement of the coal strike.

Standard Bessemer and open-hearth rails, $40; light rails rolled from new steel, 2c. to 2.25c., f.o.b. makers' mills.

Standard railroad spikes, 2.75c. to 3c., mill; track bolts with square nuts, 3.75c. to 4c., mill; tie plates, steel and iron, 2.15c. to 2.25c., f.o.b. mill; angle bars, 2.40c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.50c. base and track bolts 4.50c. base.

Structural Material.—Sustained building activity is indicated by numerous fresh fabricating awards. The taking of new business is restricted, however, by slow deliveries from the mills. In fact, fabricators are experiencing difficulty in obtaining shipments from the mills on present orders. Plain material continues to command a minimum of 2.05c., Chicago, for indefinite delivery, while the lowest quotation on reasonably early delivery is 2.20c., Chicago. The leading independent is allocating its fourth quarter production and is taking no orders unaccompanied by specifications.

The mill quotation on plain material is 2.05c. to 2.45c., Chicago. Jobbers quote 2.90c. for plain material out of warehouse.

Coke.—Local by-product foundry has advanced to $15, delivered in the Chicago switching district. Connellsville foundry is weaker at $12, ovens, but is difficult to obtain because of the transportation situation. The same trouble is incurred in connection with shipments from other outside producing centers.

Steel Castings.—An early announcement of advanced prices effective Oct. 1 is acknowledged. It is probable advances will apply particularly to certain classes of castings which are now relatively low, such as car castings in large quantities. Others may be advanced little, if at all.

Old Material.—Not only are the railroads offering few new lists, but they are slow in making deliveries against old sales and in some instances have tried to cancel unfilled contracts. As a result, sellers are short of scrap with which to fulfill their obligations with users and are bidding against each other for what little material is on the market. In one extreme instance, a dealer was forced to pay $9 a ton above his selling price in order to fill an old order. At the same time, users are paying steadily increasing prices on their new purchases. Prices are exceedingly strong and it is difficult to ascertain the true level of the market because what is being paid depends upon how badly the buyer needs the material. With scrap generally scarce, there is considerable variation in the prices governing current transactions. A conservative estimate, however, would place present quotations at from 50c. to $1 a ton or more above those of last week. An interesting development lies in that fact that prices on No. 2 wrought, which were practically identical with those on heavy melting when purchases by the steel works dominated the market, have risen above that level on a strong iron mill demand. Scrap prices are still generally low in comparison with pig iron and further advances are regarded as inevitable in view of the improbability of important railroad offerings while the carriers are concentrating on the movement of coal and grain. The Michigan Central and the New York Central offer blind lists.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton	
Iron rails	$20.50	to $21.00
Cast iron car wheels	22.50	to 23.00
Relaying rails	25.00	to 30.00
Rolled or forged steel car wheels	22.00	to 22.50
Rails for rolling	18.50	to 19.00
Steel rails, less than 3 ft.	21.00	to 21.50
Heavy melting steel	17.50	to 18.00
Frogs, switches and guards cut apart	17.50	to 18.00
Shoveling steel	17.25	to 17.75
Drop forge flashings	12.50	to 13.00
Hydraulic compressed sheet	14.00	to 14.50
Axle turnings	15.00	to 15.50
	Per Net Ton	
Iron angles and splice bars	21.50	to 22.00
Steel angle bars	17.50	to 18.00
Iron arch bars and transoms	21.50	to 22.00
Iron car axles	24.00	to 24.50
Steel car axles	18.50	to 19.00
No. 1 busheling	14.50	to 15.00
No. 2 busheling	9.00	to 9.50
Cut forge	16.50	to 17.00
Pipes and flues	12.50	to 13.00
No. 1 railroad wrought	17.50	to 18.00
No. 2 railroad wrought	16.50	to 17.00
Steel knuckles and couplers	19.00	to 19.50
Coil springs	20.50	to 21.00
No. 1 machinery cast	21.50	to 22.00
No. 1 railroad cast	19.00	to 19.50
Low phos. punchings	16.50	to 17.00
Locomotive tires, smooth	15.50	to 16.00
Machine shop turnings	10.00	to 10.50
Cast borings	12.50	to 13.00
Stove plate	17.00	to 17.50
Grate bars	17.00	to 17.50
Brake shoes	17.00	to 17.50
Railroad malleable	19.50	to 20.00
Agricultural malleable	19.50	to 20.00

Arthur G. McKee & Co., Cleveland, have been awarded a contract by the Rochester & Pittsburgh Coal & Iron Co. for designing and installing a new trestle and storage bins at the plant of the Adrian Furnace Co., Dubois, Pa. The improvements will include a steel and reinforced concrete trestle structure, approximately 480 ft. long, six ore bins, coke bin and coke breeze handling equipment. The coke bin will be centrally located, discharging direct over Cascade type screens into the skip cars, and will provide storage for approximately 135 tons of coke. Two 80 cu. ft. capacity scale cars will be furnished for handling materials from the ore and limestone bins. Arthur G. McKee & Co. have also taken a contract from the Cambria Steel Co. for designing and furnishing materials for a furnace top for one of its Johnstown, Pa., stacks. The order includes a McKee revolving distributor and auxiliary top equipment.

At a recent meeting of tube department foremen of the Youngstown Sheet & Tube Co., Youngstown, Ohio, three employees were awarded safety fobs for having shown extraordinary quickness of thought and action resulting in saving a fellow workman from serious injury or death. Samuel P. Finch, turn foreman, received a gold fob for having pulled a fellow employee from the welding rolls pit, into which he had fallen in trying to assist in rolling a tube from the welding table. Two other employees received silver fobs. Since 1914 the company has awarded 18 gold fobs. James M. Woltz, safety director, made the presentations.

New York

Readjustment Proceeds Slowly — Moderate Rates of Foreign Pig Iron

NEW YORK, Sept. 5.—It is evident that readjustment following the partial settlement of the coal miners' strikes will not be easily or quickly made and it does not seem probable that the production of pig iron in the East will be materially increased for a month or two. While some shippers report that they are getting excellent service from the railroads, others, particularly those shipping to New England, report very slow movement owing to crippled equipment. Some furnaces, which still have iron, sold at $18 to $20 to deliver will hesitate about going into blast until costs can be materially reduced. Some of these furnaces had contracts for coke at $4 which they did not receive, and were compelled to buy coke at $10, or even higher prices, before blowing out.

Pig Iron.—Moderate inquiry has come from various interests in this district, including one for 1500 tons No. 2 plain from a New England stove manufacturer and 1000 tons of No. 2X from a house furnace manufacturer for prompt delivery. The latter is understood to have bought 250 tons of foreign iron on this inquiry. A coupler company is in the market for from 1000 to 2000 tons of malleable. Prices have again become advanced $1, and $34 Eastern furnace is now apparently the minimum for No. 2 plain. Southern iron orders can be placed at $25, but deliveries are unsatisfactory. Some Southern iron sold several weeks ago has been on the road for two or three weeks, with no definite promise of reaching its destination. Foreign iron is being sold in moderate quantities, but is becoming increasingly difficult to obtain for early delivery. No Scotch iron can be bought abroad to be shipped before Nov. 1, but there is still a limited quantity on the ocean or in the hands of importers in this country. Prices on Scotch equivalent No. 2X range from $30 to $32. On French, Belgian and Luxemburg irons running rather high in phosphorus and analyzing 2.50 to 3 per cent silicon, prices range from $26.50 to $28, c.i.f. New York. A limited tonnage of German iron is being offered, but it is low in silicon and high in sulphur and is not at all attractive.

We quote delivered in the New York district as follows, having added to furnace prices $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$38.27
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	37.27
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	36.27
Buffalo, sil. 1.75 to 2.25	$37.91 to 38.91
No. 2 Virginia, sil. 1.75 to 2.25	No sales

Finished Iron and Steel.—Larger production of bituminous coal has resulted within the past week in better mill operations and a slight lessening of the restrictions which steel companies have been placing upon sales. One large independent, which has been out of the market almost entirely for several weeks, is now selling plates, shapes, bars, cold-finished bars and tin plate in limited quantities to its regular trade. Another large independent, for the first time in about two months, is alloting small tonnages to its district offices for distribution among regular customers who are in dire need. The Jones & Laughlin Steel Co., Pittsburgh, whose blast furnace operation got down to three active stacks, now has six in blast and this week will put on two more, having gotten fairly liberal supplies of coal within the past week by barge from its mines. Other steel companies which have non-union mines or those which are entirely dependent on railroads for transporting coal are not faring as well as they would like to, but their coal receipts are larger than a week or 10 days ago. There is a disposition in the trade to believe that the peak prices which have been reached on some of the heavier products, such as 2.50c., Pittsburgh, on plates, for example, will not last under the better operating conditions which the mills will now enjoy. One independent is offering bars and shapes at 2c., Pittsburgh, and plates at 2.25c. for fairly early shipment; another asks 2.25c. for all three products. In general, bars and shapes range from 2c. to 2.25c., plates from 2.10c. to 2.50c., with a majority of transactions at about 2.25c., Pittsburgh. Some makers of cold finished steel bars are quoting 2.50c. Bands are quoted at 3c., Pittsburgh, by at least one or two mills. Tin plate is now firm at $4.75 per base box, with an advance predicted for the near future, this product not having gone up in keeping with other advances. In semi-finished steel, there is great strength and it is now almost impossible to buy billets, slabs or sheet bars under $40, with wire rods strong at $45, Pittsburgh. An Eastern mill has sold 6000 tons of soft steel billets for shipment to the Chicago district at a price which corresponds to $42, Pittsburgh. A fair volume of business in structural steel continues to come into the market notwithstanding advanced prices on fabricated steel. Concrete reinforcing bars are in good demand, current inquiries aggregating several thousand tons, including one from the Lock Joint Pipe Co. for 3000 tons and others of 2000, 1350 and 1000 tons. The largest structural contract of the week involved 5000 tons for a hotel building in New York for the United Hotels Co., on which the New York Shipbuilding Corporation, a newcomer in structural steel work, was the successful bidder.

We quote for mill shipments, New York delivery, as follows: For indefinite delivery, soft steel bars, structural shapes and steel plates, 2.14c.; for delivery in a number of weeks, soft steel bars, plain structural material and steel plates, 2.34c. to 2.59c.; bar iron, 2.34c.

Ferroalloys.—Demand for ferromanganese has fallen off, due to the holiday and the strike situation, but a few sales of small lots, amounting to about 300 tons, are reported for October shipment at the regular quotation, all being British alloy. Offerings of domestic alloy are not heard of. Inquiries are light. Sales of the high grade spiegeleisen, amounting to 300 or 400 tons, were made last week at $39, furnace, for early delivery. Practically none of the lower grade alloy is being offered. There are no reports of any activity in the manganese ore market and prices are nominal. Demand for 50 per cent ferrosilicon is moderate. One large American producer announces an advance in its price to $65 per ton, delivered, as the minimum. The ferrochromium market is quiet and specifications on contract are fairly good. Quotations are as follows:

Ferromanganese, domestic, seaboard, per ton	$67.50
Ferromanganese, British, seaboard, per ton	$67.50
Spiegeleisen, 17 to 19 per cent, furnace	$38.00
Spiegeleisen, 20 per cent, furnace	$39.00
Ferrosilicon, 50 per cent, delivered, per gross ton, carloads	$55.00 to $60.00
Ferrosilicon, 10 to 15 per cent, delivered, per gross ton	$38.00 to $40.00
Ferrotungsten, per lb. of contained metal	40c. to 50c.
Ferrochromium, 4 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr., delivered	12c. to 14c.
Ferrovanadium, per lb. of contained vanadium	$3.00 to $3.50
Ferrocarbontitanium, 15 to 18 per cent, in carloads, per net ton	$200.00

Ores

Manganese ore, foreign, per unit, seaboard	28c. to 30c.
Tungsten ore, per unit, in 60 per cent concentrates, nominal	$3.00 up
Chrome ore, basis 48 per cent Cr_2O_3, crude, per ton, Atlantic seaboard	$15 to $18.50
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	42.50c. to 45c.

Cast-Iron Pipe.—Business is good, demand continuing strong. Among municipal tenders, upon which pipe makers are now bidding, opening Sept. 9, there is one calling for 450 tons of 8-in. pipe from Voorheesville, N. Y., one for 200 tons of 16-in. and 18-in. pipe from Rye, N. Y., and 50 tons of 6-in. pipe from Attleboro, Mass. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $54.50; 4-in. and 5-in., $59; 3-in., $64.80, with $4 additional for Class A and gas pipe.

High-Speed Steel.—The market is unchanged and producers continue to quote 18 per cent tungsten high-speed steel at 75c. per lb., base, with special brands of some companies ranging up to 90c. per lb.

Warehouse Business.—Effective Sept. 5, a number of the warehouses in this district and the leading independent increased prices on black and galvanized sheets from 4.60c. per lb. and 5.60c. per lb. base to 4.90c. and 5.90c. per lb., while blue annealed sheets were raised from 4.04c. per lb., the price set recently, to 4.19c. per lb., base. Other factors in the sheet business here,

however, are quoting 4.75c. and 5.75c. per lb., base, on black and galvanized respectively. Bars, shapes and plates are unchanged, but hoops have been increased by most warehouses to 4.29c. per lb., base. Cold-rolled shafting and screw stock has again been advanced by 50c. per 100 lb., and is now quoted at 3.90c. per lb. for rounds and 4.40c. for squares, flats and hexagons. Cold-rolled strip steel is now on a basis of 6.75c. per lb. Brass and copper warehouses report an advance in price on copper products of 1c. per lb. and on brass of ½c. per lb. Business in this line is good, consumers of all kinds having come into the market. Manufacturers of radio equipment are reported as again active. We quote prices on page 644.

Coke.—The coke market is somewhat easier, but deliveries are not satisfactory. Furnace coke is quoted at $10.50 to $12 Connellsville ovens and foundry $13.50 to $14.50. By-product is quoted at $14, seaboard, and the fuel administrator is still requiring that a large percentage be sent to public utility corporations. The outlook is that prices of coke will be high for a long time.

Old Material.—The market continues active and prices still show an upward tendency. Heavy melting steel is quotable at $11.50 to $12 per ton. Buying is noted from Wierton, Lebanon, Bethlehem and Alan Wood. While mills are undoubtedly in need of scrap, there is said to be a feeling that prices are rising to too high a level. Bethlehem is paying $15.50 for No. 1 heavy melting steel and on mixed borings and turnings Wierton will pay $15.25 per ton. Most of the steel now moving from this district is going either to Bethlehem or is being shipped by barge to Buffalo. No. 1 yard wrought is quotable this week at $11.50 to $12.50, machine shop turnings at $10.25 to $10.75 and specification pipe at $10.25 to $10.75.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard	$11.50 to $12.00
Steel rails, short lengths, or equivalent	12.25 to 12.75
Rerolling rails	12.50 to 13.00
Relaying rails, nominal	27.00 to 28.00
Steel car axles	17.00 to 18.00
Iron car axles	23.00 to 24.00
No. 1 railroad wrought	13.50 to 14.00
Wrought iron track	12.25 to 12.75
Forge fire	8.00 to 8.50
No. 1 yard wrought, long	11.50 to 12.50
Cast borings (clean)	10.75 to 11.25
Machine-shop turnings	10.25 to 10.75
Mixed borings and turnings	10.25 to 10.75
Iron and steel pipe (1 in. diam., not under 2 ft. long)	10.25 to 10.75
Stove plate	11.25 to 11.75
Locomotive grate bars	11.50 to 12.00
Malleable cast (railroad)	11.00 to 11.50
Cast-iron car wheels	13.50 to 14.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast	$18.50 to $19.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	16.50 to 17.00
No. 1 heavy cast, not cupola size	14.00 to 14.50
No. 2 cast (radiators, cast boilers, etc.)	12.00 to 12.50

Buffalo

BUFFALO, Sept. 5.

Pig Iron.—None of the Buffalo sellers is rushed with business and orders placed here are for carload lots and tonnages slightly in excess of that quota. One furnace is quoting $34 base and another $35 and they sell for immediate delivery only. Imported iron being bought in the Eastern territory has impaired demand for Buffalo iron. Coal is a little easier and one interest expects to start a furnace recently banked. The market is without feature.

We quote f.o.b. per gross ton Buffalo as follows, the higher prices being for early shipment:

No. 1 foundry, 2.75 to 3.25 sil.	$35.00 to $36.00
No. 2X foundry, 2.25 to 2.75 sil.	34.00 to 35.00
No. 2 plain, 1.75 to 2.25 sil.	34.00 to 34.50
Basic	34.00
Malleable	34.00
Lake Superior charcoal	36.28

Finished Iron and Steel.—The return to the selling field of the local branch of a large independent and the fact that coal is slightly easier to obtain have created a little more activity in this district. This seller is again quoting on structural shapes and plates after weeks of inactivity, and ability to quote on bar business is expected. The quotations are 2c. on shapes and 2.25c. on plates. The Steel Corporation subsidiary is quoting 1.90c. on bars and 2c. on plates. The largest local independent is advancing its minimum price on bars to 2.25c. from the 2.15c. base. Cold-finished material is in big demand; a price of 2.50c. is expected to be reached in September. Considerable business in all materials is awaiting placement and the general situation is brighter. A shortage of labor and the growing dearth of cars are matters of reckoning for the near future. Sheet prices are on the upward trend. Structural awards are for small quantities and the aggregate tonnage is fairly large, but no important jobs are expected this year.

Warehouse.—Especially heavy demand for all products appears from all corners and another advance in price has been made. The call for structural shapes is exceptionally heavy and transcends the demand for all other products.

We quote warehouse prices, Buffalo, as follows: Structural shapes, 3.10c.; plates, 2.90c.; soft steel bars, 3c.; hoops, 4c.; bands, 3.80c.; blue annealed sheets, No. 10 gage, 3.90c.; galvanized steel sheets, No. 28 gage, 5.85c.; black sheets, No. 28, 4.85c.; cold rolled round shafting, 3.95c.

Old Material.—With heavy melting steel firm at $17 to $17.25, mills are buying various sized tonnages, but there is a scarcity of big sized tonnages. The demand for machine shop turnings outside the district is good and there is generally a better feeling all around. The car situation is steadily growing serious and the shortage is expected to become acute with the settlement of coal and railroad strikes. These settlements will, in the opinion of dealers, bring about a complete withdrawal of gondola cars for the transportation of old material.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel	$17.00 to $17.25
Low phos., 0.04 and under	18.00 to 19.00
No. 1 railroad wrought	16.00 to 16.50
Car wheels	19.50 to 20.50
Machine shop turnings	10.50 to 11.00
Cast iron borings	14.00 to 14.50
Heavy axle turnings	14.00 to 14.50
Grate bars	14.00 to 14.50
No. 1 busheling	15.00 to 15.50
Stove plate	15.00 to 15.50
Bundled sheet stampings	11.50 to 12.00
No. 1 machinery cast	19.50 to 20.50
Hydraulic compressed	15.00 to 15.50
Railroad malleable	19.50 to 20.50

St. Louis

Large Stove Plants Close on Account of Pig Iron Shortage

St. Louis, Sept. 5.—The question of getting pig iron is becoming more and more a serious problem with melters in the St. Louis district, two of the largest stove foundries and a job foundry closing down within the last week because of a lack of iron. One of the stove plants expects to resume operations shortly. Between the shortage in coal and the rail situation there is very little pig iron to be had or that can be moved. A Sheffield maker has been shipping some pig iron by rail and water, sales last week amounting to 1000 tons, but no other iron of any consequential tonnage is coming through from the South. The northern makers are in a bad way for coal, and are well booked up with orders. The Granite City maker sold 1000 tons of foundry iron during the week, some of it to distant points, and negotiations now are on for the sale of 1000 tons of foundry grades to an Eastern melter. The same maker also sold a considerable tonnage of low-silicon iron at a good price. The market is around $32 Chicago for Northern iron for spot shipment, while Southern iron is quoted around $23 to $25 Birmingham. The Sheffield maker, which has been making water and rail shipments, is now out of the market.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago and $5.17 from Birmingham and 81 cents average switching charge from Granite City:

Northern foundry, sil. 1.75 to 2.25	$32.16
Northern malleable, sil. 1.75 to 2.25	32.16
Basic	32.16
Southern foundry, all rail, sil. 1.75 to 2.25	$27.17 to 29.17

Finished Iron and Steel.—The week was featured by a renewal of interest in steel by the railroads. The principal inquiry came from the Wabash, which wants 20,000 tons of 90-lb. rails, together with the necessary

splice bars and track bolts. The Missouri Pacific has an inquiry for its requirements for spring steel for the remainder of the year. A car manufacturer has asked for quotations on 2400 wheels for 300 gondola cars to be built by the Cincinnati, Indiana & Western. Interest also is being shown in the wheel requirements for the 55 locomotives to be built for the Missouri-Kansas-Texas Railway. A jobber bought 50 tons of spring steel during the week. Jobbers are showing very little interest in buying, a situation largely due to the conditions existing in the trade, as they believe it useless because of the scarcity of steel to make inquiries Fabricators are endeavoring to make some purchases covering their immediate requirements, but they, too, realizing the conditions existing in the industry, are not showing much interest in the future. The principal letting of structural steel of the week was 650 tons for the plant of the Western Cartridge Co., East Alton, Ill., in the St. Louis industrial district, which went to the Mississippi Valley Structural Steel Co. There has been a good demand for sheets.

For stock out of warehouse we quote: Soft steel bars, 2.70c. per lb.; iron bars, 2.70c.; structural shapes, 2.80c.; tank plates, 2.80c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, cold rolled, one pass, 4.85c.; cold drawn rounds, shafting and screw stock, 3.50c.; structural rivets, $3.35 per 100 lb.; boiler rivets, $3.45; tank rivets, 7/16 in. and smaller, 60 per cent off list; machine bolts, large, 50 and 10 per cent; small, 50-10 and 10 per cent; carriage bolts, large, 55-5 per cent; small, 60 and 10 per cent; lag screws, 60 per cent; hot pressed nuts, square or hexagon blank, $3.50; and tapped, $3.25 off list.

Coke.—The coke situation is very serious. But little relief has come so far as a result of settlements in the coal industry. The demand is increasing, and prices are steadily advancing. Connellsville coke is now quoted at $15 at the ovens, while Chicago by-product coke has advanced $1.50 a ton to $15 furnace, while domes to grades have advanced $1. Some Alabama coke is being sold, and a car is coming through now and then.

Old Material.—The market for old material continues steadily to advance. No material is coming in either from the country or from the railroads. The demand is heavy, and some of the mills are beginning to order for their winter requirements. Foundry grades are especially strong. Car wheels are strong and scarce. There also is a good demand for special steel grades. Relaying rails are being called for by coal mines and lumber mills.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

	Per Gross Ton	
Old iron rails	$17.75 to	$18.75
Rails for rolling	18.00 to	18.50
Steel rails less than 3 ft.	17.50 to	18.00
Relaying rails, standard section	26.00 to	29.00
Cast iron car wheels	21.00 to	21.50
No. 1 heavy railroad melting steel	17.50 to	18.00
No. 1 heavy shoveling steel	16.50 to	17.00
Ordinary shoveling steel	16.50 to	17.00
Frogs, switches and guards cut apart	16.50 to	17.00
Per Net Ton		
Heavy axle and tire turnings	11.50 to	12.00
Steel angle bars	15.75 to	16.25
Iron car axles	25.50 to	26.00
Steel car axles	19.00 to	19.50
Wrought iron bars and transoms	20.50 to	21.00
No. 1 railroad wrought	15.25 to	15.75
No. 2 railroad wrought	14.50 to	15.00
Railroad springs	18.50 to	19.00
Steel couplers and knuckles	18.50 to	19.00
Cast iron borings	11.00 to	11.50
No. 1 busheling	13.00 to	13.50
No. 1 railroad cast	19.00 to	19.50
Railroad malleable	15.50 to	16.00
Machine shop turnings	9.50 to	10.00

The Yawman & Erbe Mfg. Co., Rochester, N. Y., has placed a contract with the Cleveland Crane & Engineering Co., Cleveland, for an extensive overhead conveying system for handling cabinets through its assembling and painting departments to the shipping department. The system will include 54 one-ton carriers and electric elevators for dipping. This system will serve six baking ovens.

The Colorado Fuel & Iron Co. advanced wages of unskilled labor a little more than 21 per cent, effective Sept. 1. Common labor, which has been receiving 33c. an hour, has been increased to 40c. Advances for skilled labor will be announced later.

Boston

Sales of Foreign Iron Continue—Coke Sales Largely English

BOSTON, Sept. 5—The intervening holiday had but slight influence on the demand for foreign iron in this territory the past week, sales again amounting to several thousand tons. Business in these irons is largely confined to Scotch and "Continental," the former being the more popular of the two kinds. "Continental" iron takes a wide range, $25 to better than $27 c.i.f. dock Boston for silicon $2.50 plus, the price depending on phosphorous and manganese content. No. 3 Scotch iron sold at $30 to $32 c.i.f. Boston and No. 1 at $31 to $32, sales ranging from 1000 tons taken by a Massachusetts heater maker, to car lots. Small lots of No. 1 Scotch, part of a 3000 to 4000 ton cargo which arrived during the week, sold for spot shipment at $34 dock. About the only Scotch iron available to-day is for October shipment. Sales of domestic iron are almost nil, because furnaces are unable to ship. A small tonnage of resale high manganese Buffalo sold at $34 furnace, and No. 2X and No. 1X Alabama at prices having little bearing on the market because sales represented negotiations between foundries. Alabama iron at $35 base, Providence, R. I., dock is still available. Eastern Pennsylvania iron is quoted higher, but little is taken by melters due to the comparative cheapness of foreign brands.

We quote delivered prices, on the basis of the latest reported sales, now infrequent, and as follows, having added to furnace prices $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75	$38.15 to $39.15
East. Penn., sil. 1.75 to 2.25	37.65 to 38.65
Buffalo, sil. 2.25 to 2.75	39.41 to 41.41
Buffalo, sil. 1.75 to 2.25	38.91 to 40.91
Alabama, sil. 2.25 to 2.75	35.10 to 38.10
Alabama, sil. 1.75 to 2.25	34.60 to 37.60

Warehouse Business.—Following the advance at other large distributing centers, local warehouse prices underwent two uplifts the past week, which in the aggregate ranged from 25c. to 50c. per 100 lb. on steel, the largest spread coming in open-hearth spring steel. Plates advanced 40c., blue annealed sheets 15c., and black and galvanized sheets 25c. per 100 lb. Norway iron remains unchanged, while refined iron is 25c. to 40c. higher. Stocks of small rounds and flats, concrete bars, bands and angles are still broken. The demand for iron and steel has been stimulated by the higher prices. Wire nails have gone up 20c. to 30c. per keg. Bolts, nuts, washers and rivets are moving in normal quantities.

Jobbers quote: Soft steel bars, $3.25 per 100 lb. base; flats, $3.85; concrete bars, $3.25; structural steel, $3.25 to $3.50; tire steel, $4.50 to $4.85; open-hearth spring steel, $5 to $6.50; crucible spring steel, $12; steel bands, $4.25; hoop steel, $4.75; cold rolled steel, $4 to $4.50; refined iron, $3.25; best refined iron, $4.50; Wayne iron, $5.50; Norway iron, $6 to $6.50; plates, $3.35 to $3.55; No. 10 blue annealed sheets, $4.15 per 100 lb. base; No. 28 black sheets, $5.40; No. 28 galvanized sheets, $6.40.

Coke.—Going business in foundry coke the past week centered largely in English brands to arrive and in Southern fuel, aggregate sales for consumption in this territory exceeding 3000 tons. Most of the English coke was taken on a basis of $15 to $16 c.i.f. local dock, while Southern brought $19 delivered consuming point. The first cargo of the latter, 2500 tons, is due to arrive within 10 days and is sold. New York Interests are offering 1800 tons of English foundry coke in this territory at a little less than $15 c.i.f. dock, that city. New England producers of by-product foundry coke for September are quoting $16.50 delivered, where the local freight does not exceed $3.10, for contract fuel, but remain out of the market for spot business. The New England Coal & Coke Co. is securing a much better supply of coals and therefore will be in a position shortly to make freer deliveries of foundry coke. This fact undoubtedly will have some bearing on the market for foreign cokes.

Old Material.—The firmer feeling among yard interests, noted last week, since then has resulted in a

general marking up of old material used by mills. The higher prices are not based on any improvement in the demand for scrap, but on a growing belief that material will be scarce before the turn of the year. Present activity is confined largely to shipments against contracts previously made. Heavy melting steel values have not increased. On the other hand, those on railroad wrought, pipe, chemical borings, axles, wheels and rerolling rails are 50c. to $1 a ton higher on the average, and in a few instances even more so. Forged scrap and bundled skeleton prices are on a par with those quoted on machine shop turnings and blast furnace borings and turnings. New England foundries are showing slightly more interest in machinery cast, and the market is firmer as a result. Round tonnage lots are limited, the largest sale made the past week being 200 tons at $21.50 delivered. Stove plate also is wanted but prospective buyers and sellers are considerably apart in price.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$20.00 to $21.50
No. 2 machinery cast	18.00 to 19.00
Stove plate	15.00 to 16.00
Railroad malleable	16.50 to 17.00

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$11.50 to $12.00
No. 1 railroad wrought	13.50 to 14.00
No. 1 yard wrought	11.50 to 12.00
Wrought pipe (1 in. in diameter, over 2 ft. long)	9.00 to 9.25
Machine shop turnings	8.75 to 9.00
Cast iron borings, rolling mill	9.50 to 10.00
Cast iron borings, chemical	12.50 to 13.00
Blast furnace borings and turnings	9.50 to 10.00
Forged scrap and bundled skeleton	9.50 to 10.00
Street car axles	18.00 to 19.00
Street car wheels	15.00 to 15.50
Rerolling rails	12.50 to 13.00
Shafting	17.50 to 18.00

Cincinnati

Melters Not Inclined to Buy as Pig Iron Prices Continue to Advance

CINCINNATI, Sept. 5.—The proposed new pig iron rate from Birmingham to Ohio River crossings has been suspended until Dec. 31 by the Interstate Commerce Commission. Three furnaces in southern Ohio and St. Louis made objections to the proposed rate and a hearing will be held shortly to hear objections. In the meantime the old rate of $4.05 prevails.

Pig Iron.—While a number of sales are reported for fourth quarter shipment, most of the orders are for carload lots for immediate shipment. Melters generally are not inclined to contract at high prices, as most of them have low-priced iron now under contract and are willing to wait till the railroad situation loosens up and shipments are resumed. Prices are very firm and Southern iron is at least $2 higher than last week, $25 Birmingham being the minimum. We note one sale of 800 tons at this figure for fourth quarter for September delivery. The range is $25 to $28 and a number of carloads have been sold where shipment could be guaranteed. In southern Ohio $32 represents the market, although $34 has been done on carload lots for immediate shipment. We note a sale of a round tonnage of malleable to a central Ohio melter for fourth quarter, the iron coming from Chicago district on the basis of $32 furnace. A Michigan melter bought 1500 tons of foundry and malleable grades at the same figure. Small lot sales of silvery are also reported at the schedule though for immediate shipment it is said that $43.50 has been done for 9 per cent. Inquiries mostly are for carload lots to 200 tons for immediate shipment. Embargoes are holding up the shipment of iron from southern Ohio furnaces, the only road supplying cars being the Detroit, Toledo & Ironton.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$29.05
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	29.55
Ohio silvery (nominal), 8 per cent	39.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	34.27
Basic Northern	32.27
Malleable	34.27

Finished Material.—While inquiries continue to come in for prompt shipment material, consumers generally are not actively contracting for future shipment, and mills are equally averse to taking orders with any definite delivery promises. While 1.90c. can still be done on bars, shapes and plates for indefinite delivery, 2c. more generally represents the market, and on small tonnages for quick shipment 2.15c. is easily secured. The demand for sheets continues good, and mills are booking fourth quarter business from regular customers, with the understanding, however, that all the tonnage may not be shipped during the period. Some customers are anxious to cover for their sheet requirements at present prices for first quarter of next year, but are meeting with little encouragement. Mills are being handicapped in their operations by a shortage of cars for shipment of materials, and in order to secure a car as much red tape as was customary during the war period has to be gone through. Shipments south of the Ohio River are very poor. Some mills are using the river for points between Pittsburgh and Louisville, but the river packets generally will carry only a small tonnage of iron and steel products, the general restriction being a single carload. Prices on all products are advancing steadily, but with a resumption of coal mining operations, it is hoped that mill operations will increase in the near future. Inquiries in the structural field are limited to jobs taking less than 100 tons, and during the past week no awards of importance were made.

Plant Operations.—Steel plants in the district are maintaining their schedule of operations, but difficulties are increasing owing to coal and car shortage. It is hoped, however, that it will not be necessary to further curtail operations, which are running close to 85 per cent of capacity among all the plants.

Warehouse Business.—Prices on all products have been advanced from $2 to $4 per ton during the week, and it is considered probable that further advances will be made within a short time. The demand for materials, with the exception of wire products, is heavy, and jobbers' stocks are badly broken.

Cincinnati jobbers quote: Iron and steel bars, 2.95c. base; reinforcing bars, 3.05c. base; hoops, 4.05c. base; bands, 3.85c. base; shapes and plates, 3.05c. base; cold-rolled rounds, 3.75c. base; cold-rolled flats, squares and hexagons, 4.25c. base; No. 10 blue annealed sheets, 4c.; No. 28 black sheets, 4.70c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, $2.85 per 100 lb.; common wire nails, $3.05 per keg, base.

Coke.—It is expected that at least two furnaces in the Jackson and Wellston district will be in blast before the end of the month, as arrangements are now being completed for fuel supply. All available coke is eagerly snapped up. The situation appears to be easing up, but prices remain firm.

Old Material.—As last quoted, the scrap market is much stronger and inquiries are good, particularly for cast grades. We note a sale of 1000 tons of railroad wrought to a melter in the South and inquiries ranging from 100 to 500 tons are more prominent. Prices, while inclined to advance, are not quotably higher.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

Per Gross Ton

Bundled sheets	$9.50 to $10.00
Iron rails	15.50 to 16.00
Relaying rails, 50 lb. and up	26.50 to 27.00
Rails for rerolling	14.50 to 15.00
Heavy melting steel	14.50 to 15.00
Steel rails for melting	14.00 to 14.50
Car wheels	16.50 to 17.00

Per Net Ton

No. 1 railroad wrought	13.00 to 13.50
Cast borings	10.00 to 10.50
Steel turnings	9.00 to 9.50
Railroad cast	16.00 to 16.50
No. 1 machinery	19.00 to 19.50
Burnt scrap	10.50 to 11.00
Iron axles	19.50 to 20.00
Locomotive tires (smooth inside)	12.50 to 13.00
Pipes and flues	7.50 to 8.00

Railroad Strike Ended

The strike of train service employees on the Elgin, Joliet & Eastern Railroad, which was called in sympathy with that of the shopmen, has been settled. This road is a Steel Corporation subsidiary in the Chicago district.

Birmingham

Pig Iron for Spot Delivery Sold at $27.50—Offers of $25 Refused

BIRMINGHAM, Sept. 5.—Birmingham pig iron for spot delivery has been sold at $27.50 by one maker and quoted by another. The lots were small ones. This price is easily gotten where prompt delivery is assured. Firm offers for round lots at $25 for fourth quarter have been made and declined. At the same time, two makers remain on the base of $25 for such iron as they can book in view of the state of order books. The spot and fourth quarter markets seem to be converging. The market is very nervous. Last week's business was small and deliveries were for nearby points, a large inquiry for spot requirements having been declined on account of the rail embargoes. The only sale of consequence for fourth quarter delivery that came to the surface was one involving 2000 to 3000 tons, most of which is for October and November and brought a base of $24. Larger tonnage was proffered at a shade under that base, but was not taken. A consumer, who was offered $24 for fourth quarter, said he could do better, but there was no sale denoting that he could. Makers as a rule are out of the market for the fourth quarter. Makers now regard $25 as the base for fourth quarter because the 20 per cent wage advance announced by the Steel Corporation and to which all have conformed means $2.50 to $3 a ton more in cost of producing pig iron. Charcoal iron has been fairly active at $33 and $34. Makers seem agreed that spot and fourth quarter iron prices have about reached the same base. Birmingham iron operators have received official notice of the suspension of the lower rates on iron to Louisville, Cincinnati and St. Louis proposed by Louisville & Nashville and other Southern carriers to go in effect Sept. 1 pending further investigation. No order has been received as to lower rates proposed by the Arrow Transportation Co. and Burlington Railroad on northern Alabama iron to Chicago effective Sept. 15. The Sloss-Sheffield Steel & Iron Co. has made a shipment of 3000 tons of by-product coke to New England foundries by vessel out of Charleston. The oven price was $8, it is announced.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	$25.00 to $27.00
Basic	24.00 to 25.00
Charcoal, warm blast	33.00 to 34.00

Finishing Mills.—The finishing mills of the district remain on full turn. The Tennessee company is on double turn in the mills at Fairfield, Bessemer and Ensley. The Chickasaw Shipbuilding & Car Co. has turned out about 500 of the new cars out of the 1750 ordered by the Seaboard Air Line and they are coming out at the rate of 15 new ones and 10 to 12 repaired ones per day. The Louisville & Nashville order for 1000 cars comes next. The mills of the Gulf States Steel Co. and the American Steel & Wire Co. are on full turn in finishing departments. Mills do not seem worried over accumulations in view of the strength of the market.

Cast Iron Pipe.—The pressure pipe trade is momentarily expecting to hear of scheduled prices for the De Lavaud machine made pipe which has undergone all kinds of tests at the North Birmingham plant of the United States Cast Iron Pipe & Foundry Co. and satisfied all experts. The 6-, 8- and 10-in. sizes have been given the acid test and proven all right and the same results are expected of the 12-in. sizes. The base remains at $38.50 with many small orders, but not many new large ones coming in. Sanitary pipe has been less active and the base is $60 where it was $65. The former figure is regarded as high enough. Unfilled tonnage of sanitary pipe is believed to be less than it was. All pipe plants operate on full turn most of the time with occasional interruptions following delay in receiving pig iron. The Chattanooga plant of the leading interest was down the better part of last week, but the Birmingham plants operate on full turn. The leading interest is moving 4000 tons to the Government barracks in Honolulu via ship out of Mobile.

Old Material.—Demand for scrap is picking up and prices are much firmer with advances momentarily expected. Cast has already sold more than $1 over quoted prices to small consumers.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails	$13.00 to $15.00
No. 1 steel	12.00 to 15.00
No. 1 cast	15.00 to 16.00
Car wheels	15.00 to 16.00
Tramcar wheels	14.00 to 15.00
Stove plate	13.00 to 14.00
Cast iron borings	6.00 to 7.00
Machine shop turnings	4.00 to 5.00

Cleveland

Fuel Conditions Improved—Active Demand for Finished Materials

CLEVELAND, Sept. 5.—The fuel situation improved considerably during the week and the steel situation eased up somewhat owing to the fact that some independent mills that had been entirely out of the market are increasing operations now that steam coal has become fairly plentiful and are again entering orders. The American Steel & Wire Co., which has been operating but one of four Central furnaces in Cleveland, started up a second furnace Friday and expects to get a third stack in operation within a week. Some of the independent steel companies and merchant furnaces are now figuring on coke and coking coal, which have declined in price, and expect to resume operations shortly. The question now seems to be more one of price of fuel rather than difficulty in securing a supply. Fuel shipments from Kentucky and West Virginia, curtailed by the inability of the railroads to operate at normal capacity, show no improvement.

Pig Iron.—The market was less active during the past week than for some time. With the available supply very limited, sales were confined mostly to car lots. The price advance seems to have been checked with a maximum price of $35 that is being named on foundry iron by a Cleveland producer. Some of the lake furnaces are still able to take care of the urgent needs of their customers and are adhering to their recent price of $32 to $33 for foundry iron for early shipment and southern Ohio iron is available at the same price. Considering the scarcity, the demand for spot iron is rather light, indicating that most consumers have stocks. Now that easing up of the situation is looked for, foundries are expected to show less haste in placing orders to cover their early requirements. Inquiries include one from the Gould Coupler Co. for 1000 to 2000 tons of malleable iron for early shipment. Some new inquiries have come out for the fourth quarter contracts and on these a local furnace quoted $35, but this price failed to bring any orders. Some fourth quarter business in foundry iron is being booked in Detroit at $32, and in Buffalo at $33. No further advance has been made on low phosphorus iron. We note the sale of 1000 tons to a Pittsburgh district consumer for the remainder of the year and 700 tons in small lots all at $38.

Quotations below are f.o.b. local furnace for Northern foundry iron, not including a 50c. switching charge. Other quotations except basic and low phosphorus are delivered Cleveland, being based on a $3.02 rate from Jackson and a $6 rate from Birmingham:

Basic, Valley furnace, nominal	$27.00
Northern No. 2 fdy., sil. 1.75 to 2.25	35.00
Southern fdy., sil. 1.75 to 2.25	$30.00 to 31.00
Malleable	35.00
Ohio silvery, nom., sil. 8 per cent	40.52 to 43.52
Standard low phos., Valley furnace	38.00

Iron Ore.—Ore shipments from the Lake Superior district during August showed a gain over July in spite of the slowing down of the movement from a few ports caused by the curtailment of the railroad transportation facilities. Shipments during the month amounted to 9,016,426 gross tons as compared with 8,942,336 tons in July. Shipments for the season up to Sept. 1 were 26,309,939 tons as compared with a total movement last year of 22,300,726 tons. The rail situation on lines leading to Ashland and Escanaba has improved. At the

lower end of the lakes, railroad conditions are interfering with shipments to southern Ohio, but the ore movement to other points is about normal.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, $5.95; Old range non-Bessemer, 51½ per cent iron, $5.20; Mesabi Bessemer, 55 per cent iron, $5.70; Mesabi non-Bessemer, 51½ per cent iron, $5.05.

Bolts, Nuts and Rivets.—A price advance of 10 per cent on bolts and nuts was made by leading manufacturers Aug. 31 and rivet manufacturers on the same date advanced prices $7 per ton to 3c. for structural and 3.10c. for boiler rivets. One or two rivet manufacturers made this advance the previous week on some small lot orders. Small rivets have been advanced to 60 and 5 per cent off list, with 65 per cent off list for less than car lots. The advances are due to the increasing cost of steel. Bolt and nut manufacturers are taking orders for both immediate shipment and fourth quarter at the new prices. Some of the rivet manufacturers, in view of market conditions, are declining to make fourth quarter contracts. There was a spurt in the demand during the week, particularly from jobbers who wished to get their orders entered before the price advance.

Finished Iron and Steel.—The demand for finished iron and steel is fairly heavy, showing no falling off as compared with the past few weeks. Many consumers are badly in need of material, but it is expected that with the increased mill operations the supply will become more plentiful in the next two or three weeks. There is a very active inquiry for structural material, the demand for which is about equal to that of steel bars. The suspension of steel shipments at the Ford Motor Co. has not been followed by a holding up of orders by a number of large consumers making automobile parts and suspension orders have not come from other automobile plants. About the only change in the price situation during the week was an advance of $5 per ton to 2.50c. on plates by a local mill. Plate quotations now range from a 2c. minimum, with much of the business being placed at 2.25c., although some boiler plates are being sold at 2.50c. Quotations on steel bars range from 1.90c. to 2c. and on structural shapes from 2c. to 2.10c., although some mills are quoting higher prices for early shipment, as high as 2.35c. being quoted for shapes. The advance in steel prices has not checked building activity. The city of Cleveland will shortly ask for bids for a pumping station requiring 1000 tons of steel. The Great Lakes Engineering Works has taken a large ferry-boat for the Detroit River.

Jobbers quote steel bars, 2.81c.; plates and structural shapes, 2.91c.; No. 9 galvanized wire, 3c.; No. 9 annealed wire, 2.50c.; No. 28 black sheets, 4.25c.; No. 28 galvanized sheets, 5.25c.; No. 10 blue annealed sheets, 3.50c. to 3.61c.; hoops and bands, 3.61c.; cold-rolled rounds, 3.60c.; flats, squares and hexagons, 4.10c.

Reinforcing Bars.—The demand is fairly heavy for early shipment and much of the material is being taken out of warehouses. Prices on hard steel reinforcing bars are unchanged at 2c.

Sheets.—The demand for sheets continues fairly heavy and prices are firm. A local mill has advanced its price to 2.70c. for blue annealed in heavier gages and to 5c. for automobile body sheets, the latter for the last half of October delivery. Black sheets can still be purchased at 3.50c. and galvanized at 4.50c. for early shipment.

Coke.—Offerings of Connellsville foundry coke are more plentiful and the market is easier. While $14.50 is being quoted for better grades, lower prices are expected this week.

Old Material.—Scrap prices have further advanced and the market is very firm. There is not a great deal of activity, although there is still some demand for heavy melting steel and compressed steel to cover orders recently released by the McKinney Steel Co. Dealers have been able to buy some heavy melting steel at $16.50 from producers, but dealers are asking higher prices. The advances in pig iron prices together with the fact that railroads are not offering a great deal of scrap this month, owing probably to a scarcity of labor, have resulted in a stiffening of prices on cast scrap. A local foundry has purchased railroad malleable at around $17.50 delivered, but the market has evidently further advanced. No. 1 cast scrap is from $2 to $3 higher. A local mill has held up shipments on turnings.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel	$17.00 to $17.25
Steel rails under 3 ft	17.25 to 17.75
Rails for rolling	17.25 to 18.00
Iron rails	15.00 to 16.00
Iron car axles	18.00 to 19.00
Low phosphorus melting	18.00 to 18.25
Cast borings	13.00 to 13.50
Machine shop turnings	12.25 to 12.50
Mixed borings and short turnings	12.25 to 12.50
Compressed steel	15.00 to 15.25
Railroad wrought	14.50 to 15.00
Railroad malleable	17.25 to 17.75
Light bundled sheet stampings	11.50 to 12.00
Steel axle turnings	14.50 to 15.00
No. 1 cast	19.50 to 20.00
No. 1 busheling	12.00 to 12.50
Drop forge flashings over 10 in.	12.00 to 12.25
Drop forge flashings under 10 in.	12.00 to 12.25
Railroad grate bars	15.00 to 15.50
Stove plate	15.00 to 15.50
Pipes and flues	11.50 to 12.00

Philadelphia

Foundry Pig Iron and Steel Prices Advance Still Further

PHILADELPHIA, Sept. 5.—The iron and steel trade in this district has moved to higher price levels during the past week. Increasing costs, together with better demand, and greater commitments have brought about the changes. They cover many lines. Among them are foundry pig iron, plates, structural material, iron and steel bars, nuts, bolts and rivets, light rails, wire rods, wire products and scrap. The price increases range from 50c. and $1 a ton in the case of scrap, $2 in pig iron, and up to $5 in finished lines.

Operations have shown only slight improvement and no substantial increase is expected during the next two weeks. With heavier deliveries of coal made under priority rulings, however, it is expected that the transportation situation will become better, affording more adequate deliveries of raw materials to steel works and of manufactured products to consumers. The railroads are actively in the market for locomotives, cars, and steel tonnage for repair work in preparation for growing demands upon them.

Among the transportation difficulties which have risen is the declaration of an embargo on steel and other shipments on the Baltimore & Ohio Railroad east of Cumberland, Md.

The general tone of the trade is one of growing cheerfulness. Rollings at low prices have been entirely completed by some makers, while others have almost finished production at these levels. September therefore finds them on a higher scale which affords better margins consistent with the greater costs.

Ferroalloys.—Most consumers of ferromanganese have covered their requirements so that the greater portion of shipments, if not all of them, will have been delivered before the high tariff duty becomes effective. Inquiry is light. Last quarter standard ferromanganese is quoted at $67.50, Atlantic seaboard, while spot material is quoted at $72.50 to $75. Prompt spiegeleisen is quoted at $38.50 and is in light demand.

Pig Iron.—With a greater scarcity of domestic iron, the market continues its upward swing. No. 2 plain and No. 2 X have advanced $2 per ton, with No. 1 X quoted nominally at $37.14 to $37.64, delivered Philadelphia. No. 2 now is quoted at $35.14 to $35.64 and No. 2 X at $36.14 to $36.64. Foreign iron continues to come in good sized lots, although the incoming tonnages are said to have been overstated in some reports. Foreign iron is being delivered at approximately $5 per ton under domestic prices. It is understood that for deferred delivery Continental No. 2 plain iron can be bought for $26 and less, delivered. Sales of foreign iron include Continental, Scotch and English. Scotch iron, 2.50 to 3.25 per cent silicon, is commanding $32 to $33, delivered, for shipments over next month, Con-

tinental and English iron, 2.25 to 2.75 silicon, high in phosphorus, $28 for September shipments from abroad. Scotch iron for prompt shipment is said to have sold during the past week at more than $35. Sales of domestic iron have been extremely limited owing to restricted operations, the tonnages moving being chiefly foundry grades. Active furnaces are getting delivery on coke so that they can continue to operate. One large steel maker will blow in two additional blast furnaces this week. A round tonnage of foreign low phosphorus iron, copper, nickel, and chrome free, silicon 2 to 2.50 per cent, for delivery the middle of September has been sold at $37, c.i.f. Foreign iron ore still is coming in in fair volume, including Swedish magnetic and African hematite, at lower prices than domestic ore.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia, and include freight rates varying from 76 cents to $1.64 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$35.14 to $35.64
East. Pa. No. 2X, 2.25 to 2.75	36.14 to 36.64
East. Pa. No. 1X	37.14 to 37.64
Virginia No. 2 plain, 1.75 to 2.25 sil.	29.17 to 30.17
Virginia No. 2X, 2.25 to 2.75 sil.	30.17 to 31.17
Basic delivery eastern Pa.	32.00 to 33.00
Gray forge	31.00 to 32.00
Malleable	35.00 to 36.00
Standard low phos. (f.o.b. furnace)	38.00 to 40.00
Copper bearing low phos. (f.o.b. furnace)	35.00 to 40.00

Semi-finished Steel.—The market for semi-finished steel in this district is comparatively quiet and prices remain unchanged. Forging billets and rerolling billets have been sold the past week at the higher prices which went into effect at that time. The former is quoted at $50.17 and the latter at $45.17, delivered Philadelphia.

Plates.—Growing strength is reflected in the market for plates and more independent makers are asking as high as 2.50c., Pittsburgh, and sales at this figure are reported. The market is quoted at 2.25c. to 2.50c., attractive tonnages being available at the lower figure. Demand is of a miscellaneous character, but comes principally from the railroads for car repair work and also for new cars and locomotives. The trade is expecting increasing demands with the approach of fall. The Baldwin Locomotive Works has taken 100 locomotives for the Pennsylvania Railroad, which, in addition will build 15 locomotives at its Altoona, Pa., shops. It is expected that the 4000 to 5000 tons of plates for the 100 locomotives will be placed at once if this has not already been done. Deliveries of plates range from two to 16 weeks, depending on the sizes and kinds. A maker in this district has taken approximately 700 tons for a Wilson Line boat. Most producers are cleaned up on low priced tonnage and are on the new and higher basis.

Structural Material.—Fabricators report that a good volume of business is being taken, most of it representing small individual lots. Deliveries are being made in six to eight weeks. Plain material has advanced and now is quoted at 2.10c to 2.25c., Pittsburgh, by independent mills. Mills continue to be reluctant to quote for extended delivery.

Bars.—Independents are quoting the same range on soft steel bars, 2.25c. to 2.50c., Pittsburgh, as on plates, and sales at 2.35c. have been reported. Inquiry is fair. Light demand still exists for common iron bars. The minimum quotation on the latter now has advanced to 2.10c. from 2c., while a price as high as 2.25c. is being asked for small tonnages.

Warehouse Business.—Demand for warehouse tonnage is fair and comes from various sources, including railroads desiring prompt delivery. Prices are unchanged.

Soft steel bars and small shapes, 2.80c.; iron bars (except bands), 2.80c.; round edge iron, 3c.; round edge steel, iron finish, 1½ x ½ in., 3c.; round edge steel planished, 3.75c.; tank steel plates, ¼-in. and heavier, 2.90c.; tank steel plates, 3/16-in., 3.10c.; blue annealed steel sheets, No. 10 gage, 3.60c.; black sheets, No. 28 gage, 4.45c.; galvanized sheets, No. 28 gage, 5.60c.; square twisted and deformed steel bars, 2.90c.; structural shapes, 2.90c.; diamond pattern plates, ¼-in., 4.80c.; 3/16-in., 5c.; spring steel, 4c.; round cold-rolled steel, 3.50c.; squares and hexagons, cold-rolled steel, 4c.; steel hoops, No. 13 gage and lighter, 4c.; steel bands, No. 12 gage to 3/16-in., inclusive, 3.60c.; rails, 2.80c.; tool steel, 8c.; Norway iron, 5.50c.

Nuts, Bolts and Rivets.—An increase of approximately 10 per cent has been made by a prominent producer in this district in bolts, nuts and rivets, effective Sept. 1. The following are the new prices, Pittsburgh base: machine bolts with hot pressed nuts, increased to 50, 10 and 10 off list from 60 and 10 off list; United States standard hot pressed nuts, cold punched, square, hexagon, blank and tapped, increased to 3.75c. per pound off list from 4.50c.; steel boiler rivets increased to 3.10c. per pound from 2.50c.; structural buttonhead rivets increased to 3c. per pound from 2.40c. and small rivets increased to 65 and 5 off list from 70 and 10 off. Demand for all three products is growing and deliveries are being made in two to three weeks. The demand for rivets is, however, light but is improving. Requirements for the railroads are the greatest.

Light Rails.—Light rails, 45 pounds and under, have been advanced $5 per ton to 2.25c., Pittsburgh.

Wire Rods and Wire Products.—Soft wire rods have been increased $5 per ton in price by an independent maker and now are quoted at $45, Pittsburgh. Demand has increased. Nails now are quoted at 2.75c., Pittsburgh, and plain wire at 2.50c., Pittsburgh.

Old Material.—Most grades of scrap have been advanced from 50c. to $1 per ton. The increase does not include some of the leading grades, such as heavy melting steel and No. 1 cast scrap. Dealers still are cautious about selling, expecting still higher prices. Rolling mill demand has shown particular activity.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$15.50 to $16.00
Scrap rails	15.50 to 16.00
Steel rails for rolling	17.00 to 17.50
No. 1 low phos., heavy 0.04 and under	22.00 to 24.00
Cast iron car wheels	20.00 to 20.50
No. 1 railroad wrought	18.50 to 19.50
No. 1 yard wrought	17.50 to 18.00
No. 1 forge fire	14.00 to 14.50
Bundled sheets (for steel works)	13.50 to 14.50
No. 1 busheling	13.50 to 14.50
No. 2 busheling	10.00 to 11.00
Turnings (short shoveling grade for blast furnace use)	13.50 to 14.00
Mixed borings and turnings (for blast furnace use)	13.50 to 14.00
Machine-shop turnings (for steel works use)	14.00 to 14.50
Machine-shop turnings (for rolling mill use)	14.50 to 15.00
Heavy axle turnings (or equivalent)	14.50 to 15.00
Cast borings (for steel works and rolling mills)	15.00 to 15.50
Cast borings (for chemical plants)	17.50 to 18.00
No. 1 cast	19.00 to 20.00
Heavy breakable cast (for steel plants)	19.00 to 19.50
Railroad grate bars	16.00 to 16.50
Stove plate (for steel plant use)	16.00 to 16.50
Railroad malleable	15.00 to 15.50
Wrought iron and soft steel pipes and tubes (new specifications)	14.50 to 15.50
Shafting	21.00 to 22.00

Detroit Scrap Market

DETROIT, Sept. 5.—Cast scrap is in demand and there has been a tendency to cover on this material for the remainder of the year. As usual, the larger tonnages of scrap produced by the automobile plants has been sold for delivery to Cleveland and Valley points for September delivery. The following prices are on a gross ton basis f.o.b. cars producers' yards:

Heavy melting steel	$15.25 to $15.75
Shoveling steel	14.50 to 15.50
No. 1 machinery cast	15.50 to 16.50
Cast borings	12.00 to 13.00
Automobile cast scrap	20.50 to 21.50
Stove plate	14.00 to 14.50

The Warren Foundry & Machine Co., Phillipsburg, N. J., maker of cast-iron pipe, has changed its name to the Warren Foundry & Pipe Co. The name, which has been borne by that company since its establishment in 1856, was changed by a resolution of the stockholders and authorization of the Secretary of State of New Jersey, as it was somewhat of a misnomer, the company never having entered into the manufacture of machinery. No other change has been made.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Plates

Sheared, tank quality, base, per lb.....2.00c. to 2.50c.

Structural Material

Beams, channels, etc.....2.00c. to 2.25c.

Iron and Steel Bars

Soft steel bars, base, per lb.....1.90c. to 2.25c.
Refined iron bars, base, per lb.....2.45c.

Hot-Rolled Flats

Hoops, base, per lb.....2.75c.
Bands, base, per lb.....2.75c.
Strips, base, per lb.....2.75c.
Cotton ties, per bundle of 45 lb.....$1.12

Cold-Finished Steels

Bars and shafting, base, per lb.....2.25c. to 2.50c.
Strips, base, per lb.....4.25c.

Wire Products

Nails, base, per keg.....$2.60
Bright plain wire, base, per 100 lb.....2.35
Annealed fence wire, base, per 100 lb.....2.35
Galvanized wire, base, per 100 lb.....2.85
Galvanized barbed, base, per 100 lb.....3.15
Galvanized staples, base, per keg.....3.15
Painted barbed wire, base, per 100 lb.....2.65
Polished staples, base, per keg.....2.65
Cement coated nails, base, per count keg.....2.10c.
Woven fence, carloads (to jobbers).....73 per cent off list
Woven fence, carloads (to retailers)....70½ per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads.60 and 10 per cent off list
Machine bolts, small, cut threads.50, 10 and 10 per cent off list
Machine bolts, larger and longer..50, 10 and 10 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads,
50, 10 and 10 per cent off list
Cut threads .....50 and 10 per cent off list
Longer and larger sizes.....50 and 10 per cent off list
Lag bolts .....60 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.:
Smaller and shorter.....45 and 10 per cent off list
Larger and longer sizes.....45 and 10 per cent off list
Hot pressed square or hex. blank nuts.....$3.75 off list
Hot pressed nuts, tapped.....3.75 off list
C.p.c. and t. sq. or hex. nuts, blank.....3.75 off list
C.p.c. and t. sq. or hex. nuts, tapped.....3.75 off list
Semi-finished hex. nuts:
9/16 in. and smaller, U. S. S.....80 per cent off list
⅝ in. and larger, U. S. S.....75 per cent off list
Small sizes, S. A. E.....80 and 10 per cent off list
S. A. E. ⅝ in. and larger.....75 and 10 per cent off list
Stove bolts in packages.....80 and 5 per cent off list
Stove bolts in bulk.....80, 5 and 2½ per cent off list
Tire bolts .....50, 10 and 10 per cent off list

Cap and Set Screws

Milled square and hex. head cap screws,
75 and 10 per cent off list
Milled set screws.....75 per cent off list
Upset cap screws .....80 per cent off list
Upset set screws .....80 and 5 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb.....$3.00
Large boiler rivets, base, per 100 lb.....3.10
Small rivets .....65 per cent off list

Track Equipment

Spikes, 9/16 in. and larger, base, per 100 lb.....$2.75
Spikes, ½ in. and smaller, base, per 100 lb.....3.25
Spikes, boat and barge, base, per 100 lb.....3.25
Track bolts, base, per 100 lb.....$3.75 to 4.50
Tie plates, per 100 lb.....2.25
Angle bars, base, per 100 lb.....2.40

Welded Pipe

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛	51½	26	⅛ to ⅜.....	+ 1½	+27½
¼ to ⅜.....	57	31½	½	31½	13½
½	62	48½	¾	37½	22½
¾	66	54½	1 to 1½.....	39½	24½
1 to 3.....	68	56½			

Lap Weld

2	61	49½	2	34½	20½
2½ to 6.....	65	53½	2½ to 6.....	37½	24½
7 to 8.....	62	49½	7 to 12.....	35½	22½
9 to 12.....	61	48½			

Butt Weld, extra strong, plain ends

⅛	47½	31	¼ to ⅜.....+	9½	+42½
¼ to ⅜.....	53	36½	½	30½	18½
½	59	48½	¾	37½	23½
¾	64	53½	1 to 1½.....	39½	25½
1 to 1½.....	66	55½			
2 to 3.....	67	56½			

Lap Weld, extra strong, plain ends

2	59	48½	2	35½	22½
2½ to 4.....	63	52½	2½ to 4.....	38½	26½
4½ to 6.....	62	51½	4½ to 6.....	37½	25½
7 to 8.....	58	45½	7 to 8.....	30½	18½
9 to 12.....	52	39½	9 to 12.....	25½	13½

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 and 2½ per cent.

Boiler Tubes

Lap Welded Steel		*Charcoal Iron*	
1¾ in.	23½	1½ in.	+2
2 to 2¼ in.....	38	1¾ to 1⅞ in.....	8
2½ to 3 in.....	49	2 to 2¼ in.....	18
3¼ to 13 in.....	54	2½ to 3 in.....	23
		3¼ to 4½ in.....	25

To large buyers of steel tubes a supplementary discount of 5 per cent is allowed.

Standard Commercial Seamless Boiler Tubes

Discounts on cold-drawn tubes in carload lots, f.o.b. Pittsburgh, follow:

1 in.	57	2½ and 2¾ in.....	40
1¼ and 1½ in.....	49	3 in.	44
1¾ in.	33	3½ to 4 in.....	49
2 and 2¼ in.....	36	4½ in. and 5 in.....	41

Hot Rolled

3 in.	46	3½ to 4 in.....	51

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30, base, 85 per cent off list. Carbon 0.30 to 0.40, base, 83 per cent off list. Plus usual differentials and extras for cutting.

Seamless Locomotive and Superheater Tubes

Cents per Ft.		Cents per Ft.	
2-in. O.D. 12 gage.....	13	2¼-in. O.D. 10 gage....17¾	
2-in. O.D. 11 gage.....	14	3-in. O.D. 7 gage.....	33
2-in. O.D. 10 gage.....	15	1½-in. O.D. 9 gage.....	13
2½-in. O.D. 12 gage....	15	5⅜-in. O.D. 9 gage.....	51
2¼-in. O.D. 11 gage....	16	5½-in. O.D. 9 gage.....	53

Tin Plate

Standard cokes, per base box.....$4.75

Terne Plate

(Per package, 200-lb.)

8-lb. coating	$9.30	25-lb. coating I. C.....$14.25	
8-lb. coating I. C.....	9.60	30-lb. coating I. C.....	15.25
15-lb. coating I. C.....	11.80	35-lb. coating I. C.....	16.25
20-lb. coating I. C.....	13.00	40-lb. coating I. C.....	17.25

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....2.50c. to 2.60c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.35c. to 3.50c.

Galvanized

No. 28 (base), per lb.....4.35c. to 4.50c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.35c. to 3.50c.

Manufacturers have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic.	$0.325	Buffalo	$0.265	St. Louis	$0.43
Philadelphia, export...	0.235	Cleveland	0.215	Kansas City	0.735
Baltimore, domestic...	0.315	Cleveland, Youngstown		Kansas City (pipe)...	0.705
Baltimore, export.....	0.225	Comb.	0.19	St. Paul	0.595
New York, domestic....	0.34	Detroit	0.295	Omaha	0.735
New York, export.....	0.255	Cincinnati	0.295	Omaha (pipe)	0.705
Boston, domestic	0.365	Indianapolis	0.31	Denver	1.275
Boston, export	0.255	Chicago	0.34	Denver (pipe)	1.215

Pacific Coast $1.50			
Pac. Coast, ship plates	1.20		
Birmingham	0.69		
Memphis	0.385		
Jacksonville, all rail..	0.50		
Jacksonville, rail and water	0.415		
New Orleans 0.515			

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha, and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 30c. to 40c.; ship plates, 30c. to 40c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 30c. to 40c.; sheets and tin plates, 50c.; rods, wire rope, cable and strands, 75c.; wire fencing, netting and stretcher, 50c.; pipe, not over 8 in. in diameter, 50c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

FRENCH MARKET ADVANCES

Recent Improvement in Exports Followed by Domestic Demand—More Furnaces in Blast

(Special Correspondence)

PARIS, Aug. 24.—The situation for the present is satisfactory. The improvement in exports, due to the appreciation of British currency, to the strikes in the United States and to the inability of German sellers to book ahead, has been followed by an increase in domestic orders, and prices generally are firm. More blast furnaces have been blown in.

French iron and steel exports and imports during the first half of 1922 were as follows, as compared with last year:

	First Half 1922, Metric Tons	First Half 1921, Metric Tons
Exports		
Pig iron	247,000	316,000
Semi-finished steel	357,000	240,000
Iron ore	4,328,000	2,666,000
Imports		
Pig iron	35,000	15,000
Semi-finished steel	161,000	90,000
Hoops and strip	19,000	8,000
Tin plate	23,000	7,500

Pig Iron.—Chill-cast foundry pig iron No. 3 is firm. One Lorraine concern, probably overstocked, is still quoting 205 francs, but this price is now the exception, the present average being 205 to 215 francs. For export, Lorraine and Luxemburg producers, intent on sales to Germany, are offering but small quantities f.o.b. Antwerp at 225 to 230 francs (Belgian currency), which is equivalent to 213 to 218 francs (French currency). Belgians are quoting 220 to 225 francs, in their own currency, f.o.b. Antwerp.

Hematite pig iron, which will not be controlled by the Comptoir des Fontes Hématites after August, is now showing some hesitation. The price of 270 francs at producing works in the north of France is considered as likely to take business against British competition. This is a low price, especially as these works are only a short distance from seaports. British East Coast hematite, mixed numbers, is quoted now at about 310 to 315 francs in French northern ports.

Orders booked in July by the Comptoir des Fontes Hématites, which goes out of existence Aug. 31, totaled more than in June.

Semi-Finished Steel.—This market is active, especially for export, and a rise of 5 francs per ton is reported on mild steel products, which are now quoted f.o.b. Antwerp, per metric ton, as follows:

	Francs (French)
Ingots	300 to 305
Blooms	315 to 320
Billets	325 to 330

Delivery is becoming extended and is now not less than three months.

Beams.—Although the present demand for beams is not strong, the Comptoir Sidérurgique will not book ahead beyond October, which would indicate a belief that there will be a rise of prices after the holidays.

Rails.—A rail proposition from several tramway companies, which have agreed upon common specifications, is now being considered. The base price for rails of 20 kg. and heavier is still 500 francs.

Sheets.—Delivery is now two months for heavy and medium sheets and three months for light sheets. The Comptoir des Tôles has now entirely discontinued paying bounties on its products, which are firm and tending to rise.

Rolled Merchant Products.—Demand is good, both in the inland market and for export. Quotations range from 435 to 445 francs at producing works in Lorraine or in the East, 5 francs more than last week. Delivery is not under three months and in some cases it reaches five months for medium and small specifications.

Steel Wire.—Demand is better, at an average price of 460 francs.

Castings.—Improvement continues, particularly at works making agricultural machinery. Prices, however, remain low.

Coke.—French collieries of the Nord and Tas-de-Calais have agreed to sell to the Société des Cokes de Hauts-Fourneaux, from Aug. 10 to Oct. 31, metallurgical coke at 95 francs at ovens and coking slacks at 67 francs at mines. These are to be pooled with German cokes, the price on which has been maintained at 97 francs, Franco-German frontier, for September.

GERMAN MARKET ACTIVE

Prices Mounting Rapidly—Present Scale Scheduled for Ten Days Only—Still Below World Prices

(By Cable)

BERLIN, GERMANY, Sept. 2.

IRON and steel market is active, with prices going rapidly upward. The home demand is enormous. The iron industry union henceforth will fix prices according to dollar exchange, instead of according to mark production cost.

Foundry iron No. 1, from Sept. 1 to Sept. 10, is priced at 24,491 m. per metric ton ($19.28 per gross ton, at 7¾c. per 100 m.). Other grades of pig iron have been raised proportionately, so that the average is now about 375-fold pre-war rates.

The Steel Syndicate has raised ingots to 27,530 m. ($21.68); bars to 37,020 m. (1.30c. per lb.); sheets exceeding 5 mm. (25½ United States gage) to 41,580 m. (1.46c. per lb.); other items proportionately.

Prices at current exchange are still below world market prices and new increases are probable Sept. 10 unless the mark meanwhile makes a big recovery.

Electric Alloy-Atlas Crucible Merger Plans Progressing

YOUNGSTOWN, Sept 4.—Final details of the combination of the Electric Alloy Steel Co., plant of which is at Charleroi, Pa., and the Atlas Crucible Steel Co., Dunkirk, N. Y., are now being worked out, according to Louis J. Campbell, president of the former, who a short time ago was elected chairman of the Atlas company. Financing the merger has been completed, Mr. Campbell says, and a meeting of the stockholders of the Electric Alloy Steel Co., will be called, probably late this month, to ratify the amalgamation.

New Honorary Member of Steel Treaters

Professor Henry LeChatelier, Paris, France, has been elected to honorary membership in the American Society for Steel Treating. The celebration of the 50th anniversary of his scientific career was recently observed in Paris, and at that time Professor LeChatelier was notified and accepted his election as an honorary member. The other honorary members of the American Society for Steel Treating are:

Sir Robert Hadfield, Bart., F.R.S., London, England; Albert Sauveur, Sc.D., Cambridge, Mass.; Edward DeMille Campbell, Sc.D., Ann Arbor, Mich.; John Alexander Mathews, Sc.D., New York City; Elwood Haynes, B.S., Kokomo, Ind.

Chicago Building Falling Off

Building permits issued in Chicago in August showed a decline as compared with July. Permits were granted for 1048 buildings, fronting 30,382 ft. and involving $17,919,950, as against 1144 permits involving 33,074 ft. of frontage and $16,214,300 for the previous month. While the cost total is greater than for July, when the first decline in permits was noted, it falls nearly $10,000,000 short of the total estimated cost for permits issued in June. Taking out a single permit for the Belden Hotel covering $4,000,000, the August figure would be considerably less than that for July.

NON-FERROUS METALS

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
Aug.	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
30.....	14.12½	13.75	32.62½	5.90	5.55	6.60	6.25
31.....	14.12½	13.75	32.50	5.90	5.55	6.60	6.25
Sept.							
1.....	14.12½	13.75	32.62½	5.90	5.55	6.60	6.25
2.....	14.12½	13.75	....	5.90	5.55	6.60	6.25
5.....	14.12½	13.75	32.50	5.90	5.55	6.60	6.25

*Refinery quotation.

New York

NEW YORK, Sept. 5.

The Labor Day holiday has interfered with the general course of the markets and only light business is reported in any of the metals. In all of them, however, the price situation is firm.

Copper.—Toward the close of last week some sellers reported an increase in inquiries for electrolytic copper, but because of the holiday these have not yet resulted in orders. Moderate sales were made last week. While there is no change in the price situation the tone is, if anything, firmer, and quotations are steady at 13.75c., refinery, or 14c., delivered, for the remainder of the year. Some sellers are either out of the market or asking at least ⅛c. higher. Lake copper is steady at 14.12½c., delivered.

Copper Averages.—The average price of Lake copper for the month of August, based on daily quotations in THE IRON AGE, was 14.12½c., New York. The average price of electrolytic copper was 13.74c., refinery, or 13.99c., delivered.

Tin.—The market for Straits tin has been exceedingly quiet and devoid of feature. The moderate sales referred to as having been made a week ago to-day, Aug. 29, amounted to about 300 tons, mostly near future delivery. On Aug. 31 there was some pressure to sell, metal for any position being offered at 32.50c., but buyers were not interested and the market was stagnant. Other days of the week, including to-day, have been extremely inactive. In the entire week, futures have been neglected. Spot Straits tin to-day was quoted at 32.50c., New York, and the London market stood practically the same as a week ago at £159 10s. for spot standard, £159 17s. 6d. for future standard and £160 per ton for spot Straits. Deliveries into consumption during August are returned as 4150 tons, with 2166 tons in stock and 640 tons landing on Aug. 31. Imports for the first eight months this year have been 3825 tons as against 12,978 tons for the same eight months last year.

Lead.—The market is quiet with a fairly steady demand at unchanged prices. For September delivery the quotation of the leading interest is 5.70c., St. Louis, or 5.90c., New York, with the outside market at 5.55c., St. Louis, or 5.90c., New York, which we quote as the market.

Zinc.—The general situation is unchanged with only a moderate demand and no particular pressure to sell. Prime Western is quoted firm at 6.25c., St. Louis, and 6.60c., New York, as a minimum, with some sellers asking 6.30c., St. Louis, and 6.65c., New York. There is some uneasiness regarding the ore situation in the West, due to lack of cars and inability of railroads to transport ore or even coal. Equipment is also reported as very bad on some railroads in the ore district. If this situation continues it will interfere with production.

Antimony.—Wholesale lots for early delivery are quoted unchanged at 5.37½c. per lb., duty paid, New York.

Aluminum.—Virgin metal, 98 to 99 per cent pure, in wholesale lots for early delivery, is quoted by the leading interests at 19.10c., f.o.b. plant, with importers offering the same grade from foreign producers at 17.75c. to 18c., per lb., duty paid, New York.

Old Metals.—Prices are practically stationary but the tendency of the market seems better. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	13.50
Copper, heavy and wire	12.75
Copper, light and bottoms	11.25
Heavy machine composition	10.50
Brass, heavy	8.25
Brass, light	6.50
No. 1 red brass or composition turnings	9.00
No. 1 yellow rod brass turnings	7.50
Lead, heavy	5.00
Lead, tea	4.00
Zinc	3.75

Chicago

Sept. 5.—In a very quiet market tin has advanced slightly and spelter has declined. Among the old metals zinc has advanced. We quote, in carload lots, lake copper, 14.25c.; tin, 33.50c. to 34c.; lead, 5.65c.; spelter, 6.25c.; antimony, 7c., in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 11c.; copper bottoms, 9.25c.; red brass, 8.75c.; yellow brass, 6.75c.; lead pipe, 4.50c.; zinc, 3.75c.; pewter, No. 1, 20c.; tin foil, 22.50c.; block tin, 26c., all buying prices for less than carload lots.

St. Louis

SEPT. 5.—Lead was easier for the week, while slab zinc held steady at unchanged prices. We quote: Lead, 5.60c., car lots, against 5.65c. to 5.70c. last week; slab zinc, 6.25c. On old metals we quote: Light brass, 3.50c.; heavy red brass and light copper, 7c.; heavy yellow brass, 4c.; heavy copper and copper wire, 7.50c.; zinc, 2c.; lead, 3c.; pewter, 15c.; tin foil, 16c.; tea lead, 2c.; aluminum, 9c.

British living costs are dropping. The July excess over 1914 is given as 81 per cent, against 84 per cent in June. The reduction is ascribed entirely to reduction in the price of potatoes.

COMING MEETINGS

September

American Engineering Council. Sept. 8 and 9. Executive board meeting, Boston. Report on three-shift day in industry. Secretary, L. W. Wallace, 719 Fifteenth Street, N. W., Washington.

Association of Iron and Steel Electrical Engineers. Sept. 11 to 15, inclusive. Annual convention, New Auditorium, Cleveland. Secretary, J. F. Kelly, 513 Empire Building, Pittsburgh.

National Exhibition of Chemical Industries. Sept. 11 to 16. Grand Central Palace, New York.

American Electrochemical Society. Sept. 21, 22 and 23. Fall meeting, Windsor Hotel, Montreal, Canada. Secretary, Dr. Colin G. Fink, Columbia University, New York.

American Institute of Mining and Metallurgical Engineers. Sept. 25 to 29. Pacific Coast meeting, Engineers' Club, San Francisco. Secretary, F. F. Sharpless, 29 West Thirty-ninth Street, New York.

October

American Society for Steel Treating. Oct. 2 to 7. Convention and exposition, General Motors Co. Building, Detroit. Secretary, W. H. Eisenman, 4600 Prospect Avenue, Cleveland.

Society of Industrial Engineers. Oct. 18 to 20. McAlpin Hotel, New York. Secretary, George C. Dent, 327 South LaSalle Street, Chicago.

American Gear Manufacturers' Association. Oct. 9, 10 and 11. Semi-annual meeting, Chicago. Secretary, F. D. Hamlin, 4401 Germantown Avenue, Philadelphia.

COPPER USE INCREASES

Automobile Industry Will Require 30,000,000 Pounds More This Year Than in 1921

Approximately 100,000,000 lb. of copper will be utilized this year in the manufacture of automobiles in the United States, according to a survey just completed by the Copper and Brass Research Association. This is an increase of 30,000,000 lb. over 1921, and is about 750,000 lb. more than for 1920, in which year the automobile industry consumed 7.63 per cent of the total copper production.

Commenting on the use of copper in the automotive industry, the survey says in part:

"In pre-war days, particularly since the time when the automobile definitely emerged from the luxury class, the demand was in excess of the supply. Consequently, there was practically no incentive to cheapen material costs; and copper, brass and bronze were widely used in construction, where their properties, according to the best principles of machine design, established by generations of engineering experience, made them of service.

"During the war years, an abnormal condition arose. The price of copper increased, its use was restricted to non-essential industries, and the automobile manufacturer was forced to substitute inferior metals.

"In 1919, with removal of war-time restrictions, copper was still relatively high, and the automobile manufacturer continued this practice of substitution. During the period of inflation after the armistice there was a tremendous increase of manufacturing facilities, in order to keep up with the increasing demand for automobiles.

"Then came the 'buyers strike' in 1920. The demand for automobiles dwindled, and in an effort to revive sales, manufacturer vied with manufacturer in successive price cuts.

"Under insistent pressure to lower costs, automobile manufacturers turned their attention first to the more expensive metal, copper, and carried still further the principle of substitution, first generally established during the war years.

"Substitution took many forms, among them being sheet-iron water tanks in place of brass or copper; malleable or cast-iron water line fittings in place of brass; cast-iron carbureter bowls in place of brass; die-cast babbitt main bearings and crank pin bearings in place of bronze-backed babbitt.

"Other substitutions were cast iron bushings in place of bronze in camshaft bearings, rocker arm bearings, spring eyes, shackle bolts, brake equalizers, etc. (in many cases, there are no bushings at all); cut-steel or aluminum alloy small gears, for pump drive, timer shaft, etc.; cast iron water-pump casing and impeller in place of bronze or brass; aluminum or pressed steel hub caps in place of nickeled brass; aluminum, enameled iron, or sherardized steel windshield trim, body trim, hardware and hood trim; steel latches in place of brass; steel screws, nuts and bolts in place of brass; malleable or cast iron special fittings such as caps, covers, plugs, glands, control links, in place of cast brass."

New Cement Plants in Alabama

BIRMINGHAM, Ala., Sept. 5.—The Phoenix Portland Cement Co., Nazareth, Pa., has purchased 80 acres of limestone-laden land from the Sloss-Sheffield Steel & Iron Co., contiguous to the latter's by-product coking plant in North Birmingham, and is assembling materials for construction of a 1,500,000-barrel cement plant to cost over $2,500,000 and scheduled to be completed by next May. Contracts for the machinery have been awarded as follows: Converters to the Worthington Pump & Machinery Co.; driers and kilns to the Vulcan Iron Works, Wilkes-Barre, Pa.; tube mills to the Traylor Engineering & Mfg. Co., Allentown, Pa.; electrical equipment to the General Electric Co.; locomotive cranes to the Orton & Steinbrenner Co., Huntington, Ind.; traveling cranes to the Champion Engineering Co., Kenton, Ohio; Bradley Hercules mills to the Bradley Pulverizer Co., Allentown, Pa.

The Lehigh Portland Cement Co. is assembling materials for rush work on construction of a 1,000,000-barrel plant on a tract of 300 acres of limestone-laden land in the vicinity of the Alabama By-Products Co. coking plant in East Birmingham and very close to the plant being built by the Phoenix Portland Cement Co. of Nazareth, Pa.

Russian Manganese Ore for Germany

According to reports from Kharkoff, the concession commission in the Ukraine recently examined various applications from foreign firms for concessions. One leading foreign firm submitted an offer for the leasing of the iron ore mines at Kholaczevskie, in the basin of the Krivoi-Rog, but the commission refused to grant a concession on the ground that the iron ore mines can only be leased if blast furnaces are operated. The German Mining Association of Essen—the Berk und Hüttenwerke—is reported to have been more successful. After protracted negotiations with the Ukraine commission in Berlin, the association is said to have arranged for the annual supply of a large quantity of manganese ore in return for the delivery to the Ukraine Mining Administration of materials for the working of the mines, including cables, pumps, etc. The German association will only accept the delivery of high-grade ore.

Alabama Coal Prices

BIRMINGHAM, Ala., Sept. 5.—Governor Kilby has, through Fuel Administrator Roy R. Cox, announced the following maximum prices for coal from Alabama mines: Big seam, run of mine $2.60, domestic lump $3.45; Pratt, Jagger and Corona group, run of mines $3, domestic lump $4.45; Cahaba and Black Creek group, run of mine $3.60, domestic lump, $5.20; Montevallo and Climax group, run of mine $4, domestic lump $6 per ton. These are maximum prices for the fall and winter. The retail prices are lower than at this time last year and the steam coal prices are regarded as reasonable, the extra mine wage of 20 per cent effective Sept. 1 considered.

Will Spend $12,000,000 in Dams

BIRMINGHAM, Ala., Sept. 5.—The Alabama Power Co. has asked permits of the Federal Power Commission for the construction of four dams on the Tallapoosa River in Alabama, a non-navigable stream. Work will begin shortly after permits are granted and will involve $12,000,000, the power created to be 140,000 hp. The company also announces the construction at once of a high tension transmission line from Mitchell dam to the Georgia State line at Lanet, where a large group of cotton mills is located. This is to cost $1,000,000. Mitchell dam, which will generate 120,000 hp., is expected to be completed by next March and the power is practically bidden for already.

Utilizing Russian Scrap Iron and Steel

Owned jointly by the Soviet Government and a German combine, a German-Russian company called Deutsch-Russische Metall-Gesellschaft, or Derumetall, has been formed to collect, purchase and utilize the immense quantities of scrap iron in Russia. Several shipments have already been made to Germany. It is estimated that there are in Russia over 3,000,000 tons of scrap iron, of which nearly 500,000 tons is in Petrograd, and 200,000 tons at the Black Sea ports. The company will for the moment deal only with the latter, as the cost of bringing the scrap from the interior would be too high to leave a profit. From these easily accessible supplies the Soviet Government, it is estimated, will receive about ten million gold rubles (£1,000,000 or $4,865,000).

PERSONAL

J. N. Garfield has been appointed district manager for Ohio of the Isthmian Steamship Lines, a subsidiary of the United States Steel Corporation, which operates its ocean boats, and has opened an office at 1235 Guardian Bldg., Cleveland. This is the second district office to be opened by the Isthmian Lines. An office was established recently by Mr. Garfield in Buffalo, which has now been placed in charge of W. C. Shields, Jr.

John D. Wise, who for the past year has had charge of the foundry school at the University of Illinois, has returned to the sales department of the Osborn Mfg. Co., Cleveland, and will devote his attentions to sales engineering work in connection with foundry equipment.

Samuel W. Hilt, formerly district manager of sales, Camden Forge Co. at New York, has been appointed manager of sales of Pennsylvania Steel Export Co., Philadelphia, effective Sept. 1.

D. J. Felkel, formerly superintendent of the Covington, Va., blast furnace plant of the Low Moor Iron Co., is now superintendent of the blast furnace department of the Cia. Fundidora de Fierro y Acero de Monterrey, S. A., Monterrey, N. L., Mexico.

Lawrence M. Keeler, of the Whitin Machine Works, manufacturer of textile mill machinery, Whitinsville, Mass., sailed from New York the past week for Havre, France, on a business trip through France and Spain.

A. G. Douglas, chief engineer, and W. H. Mortlock, production manager, Hoskins Iron & Steel Co., Ltd., Lithgow, New South Wales, Australia, recently visited the plant of the St. Louis Coke & Chemical Co., Granite City, Ill. These gentlemen are visiting a number of representative iron and steel plants in this country and Canada for the purpose of familiarizing themselves with American practice.

Robert H. Libke, until recently a member of the sales force of the E. L. Essley Machinery Co., Chicago, has been appointed manager of the Chicago office of the Toledo Machine & Tool Co., Toledo, Ohio, manufacturer of presses and squaring shears, succeeding Edward Brucker. Mr. Libke will have his office in Machinery Hall, corner of Clinton Street and Washington Boulevard.

H. J. Swanson, formerly sales manager Detroit Machine Tool Co., Detroit, Mich., has been appointed manager the Peerless Machine Co., manufacturer of hack saws and metal shaping saws, Racine, Wis.

Robert N. Todd, for the past two years in the New York sales office of the Pawling & Harnischfeger Co., Milwaukee, Wis., cranes, hoists and excavators, has resigned to become associated with Walter Price, Philadelphia, agent for the Ford Motor Co. Mr. Price was formerly Eastern sales manager of the Pawling & Harnischfeger Co. Mr. Todd was previously with the Bethlehem Steel Co.

Thomas M. Rees, Jr., for the past ten years in the Pittsburgh office of Motch & Merryweather Machinery Co., has been appointed Pittsburgh district sales representative of Treadwell Engineering Co., Easton, Pa., and will assume his new duties Oct. 1.

J. Brynmor Hill, director Gorsienon Steel & Tinplate Works, Swansea, Wales, who spent several weeks in this country in visiting steel plants, was a passenger on the Majestic, which sailed from New York, Aug. 26.

W. C. Allen, who has been in charge of the Chicago branch of the Black & Decker Mfg. Co., Towson Heights, Baltimore, for the past year, has been promoted to sales supervisor. R. S. Mitten has been appointed to fill the vacancy caused by the promotion.

Owen K. Parmiter, metallurgist, Firth Sterling Steel Co., McKeesport, Pa., was the speaker at the monthly meeting of Pittsburgh Chapter, American Society for Steel Treating at the William Penn Hotel, Pittsburgh, Tuesday evening, Sept. 5. His subject was "Stainless Steels."

John W. Porter, vice-president Alabama Co., who has been resting from his duties for several weeks, has returned to Birmingham and is again at his desk fully restored to normal health.

Russell E. Fox, formerly connected with the Philadelphia sales office of the American Sheet & Tin Plate Co., is now with N. & G. Taylor Co., manufacturer of tin plate, Philadelphia, as production manager.

Alfred J. Lewis has been appointed Cleveland district representative, Pittsburgh Grinding Wheel Co., Rochester, Pa., with offices at 208 Fountain Building, West Second Street, Cleveland. Mr. Lewis has had more than 15 years' shop experience with Babcock & Wilcox Co., Barberton, Ohio; American Steel Foundries, Alliance, Ohio; Ferro Machine & Foundry Co., Cleveland; Detroit Steel Casting Co., Detroit, and the Otis Steel Co., Cleveland.

OBITUARY

EDWIN NEWTON OHL, one of the organizers of the Cherry Valley Iron Co., with a blast furnace at Leetonia, Ohio, and who was active in other iron and steel companies, died in New York, Sept. 3. He was born in Ohltown, Ohio, 72 years ago. For the past 30 years he had made his home in Pittsburgh. He was a director of the Pittsburgh Radium Co. and president and director of the American Roller Bearing Co. He also was a director of the Keystone National Bank, Pittsburgh, the Amortization Mortgage Co. and the Republican Casualty Co.

JAMES S. HUMBIRD, of Pittsburgh, at one time general manager Westinghouse Electric & Mfg. Co., East Pittsburgh, died in Atlantic City, Sept. 2, while on a visit at that resort. He was born in Cumberland, Md., 60 years ago and was a graduate of Washington and Jefferson College, Washington, Pa. Prior to becoming affiliated with the Westinghouse company, Mr. Humbird for a number of years was general manager Western Electric Co., Chicago.

JOHN T. MCHUGH, assistant superintendent of the Farrell, Pa., plant American Steel & Wire Co., died at his home in Farrell, Aug. 30. He was 65 years old and had been identified with the Sharon wire mills for the past 22 years. He had been identified with the wire industry for 55 years, having been an early associate, in the mills of the old National Wire Co., New Haven, Conn., of James A. Farrell, now president United States Steel Corporation, when the latter was a wire drawer. When they went West together, both went to work in the Braddock, Pa., mills of the American Steel & Wire Co. Before going to Sharon, Mr. McHugh was employed in the nail plant which the American Steel & Wire Co. once operated in Salem, Ohio.

HERBERT S. DORNBERGER, professor structural engineering, Carnegie Institute of Technology, who also was chief engineer in the Pittsburgh district for the Truscon Steel Co., Youngstown, Ohio, died at the Mercy Hospital, Pittsburgh, Aug. 30. He was 38 years old. He was graduated from Gettysburg College and for two years was a member of the faculty of that institution. Later he took a post-graduate course at Massachusetts Institute of Technology.

EDMUND L. FRENCH, a director of the Crucible Steel Co. of America and manager of its Syracuse plants, died suddenly from heart disease Thursday afternoon, Aug. 31, at Tully Lake Park. He was 52 years of age.

British Iron and Steel Market

United States Still Buying British Pig Iron — British Steel in Better Demand, Due to Continental Exchange Chaos

(By Cable)

LONDON, ENGLAND, Sept. 5.

Pig iron is firm on further sales on American account, including 5000 tons of West Coast hematite. Further shipments of this material are expected. Canada is buying Cleveland pig iron. Home trade consumers are contemplating entering into contracts extending over the end of the year. Cleveland makers are well booked up and an increased output is expected. Seven or eight furnaces, it is said, will be re-lighted. There is an improved demand for East Coast hematite, but stocks are still heavy.

Steel business is increasing. Northeastern works have secured good orders for shipbuilding materials. Prices are thought to be too low and advances are anticipated if substantial demand develops. The Clyde shipbuilding output for August was 53,123 [gross register] tons.

Variations in exchange rates affect the Continental position. Belgian works have accepted joist (beam) orders at £6 15s. (134c. per lb.) f.o.b., October, November, shipments, but the general quotation is higher. China and India are buying moderately. Belgian merchant bars have been sold at £9 7½s. (1.87c. per lb.) cost and freight to China. Three-eighths-in. plates have been sold at £8 2½s. (1.62c per lb.) cost and freight to India.

Tin plate is steady but quiet. The oil plate orders [for Eastern markets, reported last week at 250,000 boxes] have been increased to 350,000 boxes. Exports generally are quiet, though there is a fair demand from Canada and some business is reported. Home trade buying is fairly steady. Obi sizes are being done at 19s. ($4.24) basis, f.o.t.

Canada is buying Welsh black plate. Galvanized sheets are quiet and black sheets are dull. Japan is inquiring for thin gages and sheets for galvanizing.

We quote per gross ton, except where otherwise stated, f.o.b. maker's works, with American equivalent figured at $4.46 per £1, as follows:

Durham coke, delivered	£1 7s.		$6.02	
Cleveland No. 1 foundry	4 15		21.19	
Cleveland No. 3 foundry	4 7½	& £4 7½*	19.51 &	$19.51*
Cleveland No. 4 foundry	4 5	to 4 7	18.96 to	19.40
Cleveland No. 4 forge	4 2½	to 4 5	18.40 to	18.96
Cleveland basic	4 0		17.84	
East Coast mixed	4 9	to 4 10*	19.85 to	20.07*
Ferromanganese	15 0		66.90	
Ferromanganese*	14 10	to 14 15	64.67 to	65.79
Rails, 60 lb. and up	7 15	to 8 15	34.57 to	39.03
Billets	7 2½	to 8 0	31.78 to	35.68
Sheet and tin plate bars, Welsh	7 7½		32.89	
Tin plates, base box	0 19¼	to 0 19⅝	4.29 to	4.32
			C. per Lb.	
Ship plates	9 0	to 9 10	1.79 to	1.89
Boiler plates	11 10	to 12 10	2.29 to	2.49
Tees	9 5	to 10 5	1.84 to	2.04
Channels	8 10	to 9 10	1.69 to	1.89
Beams	8 5	to 9 5	1.64 to	1.84
Round bars, ¾ to 3 in.	9 5	to 10 0	1.84 to	1.99
Galvanized sheets, 24 g.	16 5	to 16 10	3.23 to	3.28
Black sheets	12 0		2.39	
Steel hoops	12 0	& 12 5*	2.39 &	2.44*
Cold rolled steel strip, 20 g.	23 2½		4.60	
Cotton ties, Indian specifications	15 0		2.99	

*Export price.

Continental Prices, All F. O. B. Channel Ports, Delivery as Specified

No. 3 foundry pig iron:			
Belgium, October	£4 2½s.	$18.40	
Luxemburg, October	4 2½	18.40	
France, October	4 2½	18.40	
Billets:			
France, Oct., Nov	5 10	to £5 15s.	24.53 to $25.65
Luxemb'g, Oct., Nov.	5 10	to 5 15	24.53 to 25.65
Lorraine, Oct., Nov.	5 10	to 5 15	24.53 to 25.65
Wire nails (keg basis):			
Germany	0 14½	3.23	
Belgium	0 20½	4.57	
Wire rods, 5 mm. (0.2 in.):			
Belgium	7 5	to 10 7½	32.34 to 46.27
Angles:			C. per Lb.
Belgium, September	7 7½		1.47
Tees:			
Belgium	8 5		1.64
Merchant bars:			
Belgium, Nov., Dec.	7 7½	to 7 12½	1.47 to 1.52
Luxemb'g, Nov., Dec.	7 7½	to 7 12½	1.47 to 1.52
France, Nov., Dec.	7 7½	to 7 12½	1.47 to 1.52
Germany, Dec.	7 15	to 8 0	1.54 to 1.59
Channels:			
Belgium	7 10	to 7 12½	1.50 to 1.52
Joists (beams):			
France, Oct., Nov.	7 0	to 7 2½	1.39 to 1.42
Belgium, Oct.	7 0	to 7 2½	1.39 to 1.42
Luxemburg, Oct.	7 0	to 7 2½	1.39 to 1.42
⅜-in. plates:			
Germany, Nov., Dec.	8 0		1.59
Belgium, Sept., Oct.	7 10	to 8 0	1.49 to 1.59
Luxemb'g, Oct., Nov.	7 17½		
France, not offered.			
⅛-in. plates:			
Germany	9 0		1.79
No. 8 gage wire:			
Belgium, August	14 10⅝		2.89

Coal Exports to America and Canada—American Pig Iron Buying—Irish Urged to Buy Direct

LONDON, ENGLAND, Aug. 24.—America is still booking large quantities of coal here, mostly from Wales, with the result that prices of the latter have recently advanced 1s. a ton. There has, however, been a reduction in shipping freights of 5s. a ton. Canada is also still showing a fair amount of interest, and has booked some orders for Welsh anthracite coal.

Conditions in the pig iron market have not shown much improvement, though sales continue to be made on American account. The Middlesbrough market has been closed this last week owing to holidays, so that it is difficult to judge the position accurately, but there is no doubt that stocks of pig iron are accumulating, and that makers would be glad to get rid of them even at a low price. Export demand, apart from that of America is still very dull, and home trade consumers are not disposed to enter into any forward commitments during the present uncertainties. In view of this position it is, therefore, rather obscure as to why Cleveland producers should fix an export premium for foundry pig iron. Nevertheless they have done so, and some makers are now asking 90s. for No. 3 G. M. B. for shipment, while they are willing to accept 87s., and possibly less, for the same material for use in the home trade. Hematite is a very weak market, and East Coast Mixed Numbers have sold at 88s., and it is quite possible to place substantial contracts at an even lower figure. At one time it was thought that Italy might be coming in to buy, but the recent disorganization of the whole of the continental exchanges has naturally precluded buying from those quarters.

In finished iron and steel there has been a little more business, India and South America in particular having recently placed some good orders for plates and shapes, but Australia is still the mainstay of the export markets, though even here no important tonnages are mentioned. Prices have not been changed, but there are some works who are disposed to accept less money for the business going, while others prefer to pass the business by rather than cut the price by so much as 2s. 6d. a ton. A small demand has set in for boilers, both for land and submarine purposes, which has enabled Yarrow & Co., of Scotstoun, Glasgow, to reopen their plant, which has been closed down since last November. These orders have been taken for the Far East.

Harland & Wolff are getting busier at Belfast, having received instructions to resume work on a number of vessels which was on hand, and had been suspended owing to the depression in the shipping trade. It is stated that already this year the production on the Lagan is greater than that for the whole of last year.

It is interesting to note the attitude of the Irish Free State as regards iron and steel business. The department of Commerce of that country is sending out communications to industrialists and business men in Belgium, urging them to trade directly with the buyer in Ireland rather than make use of an intermediary in England. Of course, the means of transport between Belgium and Ireland are few and expensive, and there is consequently quite a good price margin in favor of firms here which make purchases in bulk in Belgium, and sell in small parcels throughout the British Isles.

Machinery Markets and News of the Works

OUTLOOK MORE PROMISING

More Activity in Machine Tools Is Indicated for September

Price Advances Are Expected to Bring Action on Much Pending Business

With some of the uncertainty removed from the industrial situation by the virtual settlement of the bituminous and anthracite coal strikes, it is predicted that the machine-tool trade will feel the stimulus of business recovery during September. Another factor tending toward the more liberal buying of machine tools is the tendency now shown by manufacturers to advance prices in keeping with rising costs. For example, it is reported from one or two centers that sales of turret lathes have taken a spurt in anticipation of price advances which become effective this month.

A prominent line of boring mills has been advanced 10 per cent, effective Sept. 16; a manufacturer of engine lathes and shapers has also announced a price advance approximating 10 per cent; a well-known line of shapers and a well-known line of small lathes have been advanced. Other advances are predicted and many will probably go into effect before Oct. 1.

Announcement of these various price advances is expected to have the effect of closing up much of the business that has been pending. Railroad buying in particular is expected to increase. At Chicago it is expected that the Chicago, Burlington & Quincy will buy on its recent large list within a week or two. The Chicago, Milwaukee & St. Paul may close on a small list, and the list of the Chicago, Rock Island & Pacific is still pending, and action on this and remaining requirements of the Atchison, Topeka & Santa Fe would not be surprising in view of the rising prices of machine tools.

A good deal of the past week's activity took place in the automobile manufacturing districts. The Studebaker Corporation, South Bend, Ind., bought additional piston turning equipment, and the International Harvester Co. bought a number of tools. The Nash Motor Co. is expected to place orders shortly for special purpose machinery.

The American La France Co., Elmira, N. Y., has bought a small list of tools, including five or six turret lathes; the Ternsted Mfg. Co., Detroit, has bought 70 small punch presses; the Lima Locomotive Co., Lima, Ohio, is expected to place orders for about 25 tools within a week or so. Pickands, Mather & Co., Cleveland, has issued a list calling for bids on nine machines for a mine at Ely, Minn.

In New England not much buying has been done, but there is an inquiry for 20 used presses, and another inquiry calls for bending and rolling equipment. The New York market has been quiet.

There is more activity in cranes, and prominent among current inquiries is one from the Pennsylvania Railroad for 12, most of them for heavy loads.

New York

NEW YORK, Sept. 4.

QUIETNESS still rules in this district, undoubtedly accentuated this week by the usual pre-holiday dullness. In general, sellers of used tools state that August was a fairly satisfactory month and they look forward to about the same satisfactory conditions in September. One dealer here reports the sale of two large tools the past week. Sellers of new machines, on the other hand, feel that but little improvement in the present dullness is to be expected until the strike situation clears up. In some types of used tools a growing scarcity of machines in good condition is said to exist. Such a scarcity, should it become more marked, will undoubtedly force some buyers, who have been satisfying requirements with used tools, into the new machinery market. The General Electric Co. is still buying, one or two tools at a time.

Few purchases of cranes are noted this week but several good inquiries are current. One of these, which is the largest that has appeared in this district for some time, is from the Eastern Region of the Pennsylvania Railroad, Philadelphia, and calls for bids on two 250-ton, 80-ft. 11-in. span double trolley overhead traveling cranes; one 60-ton, 104-ft. 4-in. span, double trolley overhead crane; one 60-ton, 90-ft. 9-in. span, double trolley overhead crane; two 25-ton, 79-ft. 9-in. span, single trolley overhead cranes; and six 15-ton, 77-ft. 6-in. span, single trolley overhead traveling cranes. There is also a request for bids from the Board of Harbor Commissioners, Municipal Building, Wilmington, Del., Closing Sept. 8, which includes equipment for the Wilmington Marine Terminal. This tender includes three 20-ton, 50-ft., 60-ft. and 70-ft. booms, steam locomotive cranes; three 2½-ton, light duty, electric portal cranes; four 2-ton capacity portable electric dock winches; six electric tractor trucks with spare batteries; three load carrying trucks; 50 trailers for the electric tractors; and a 200-ton railroad track scale.

Among recent sales are:

Ed. Edinger Co., Cedar Rapids, Iowa, a 5-ton, 40-ft. span, 3-motor overhead traveling crane from the Northern Engineering Works.

Parke Davis & Co., Detroit, Mich., a 12-ton, 35-ft. span overhead crane from the Northern Engineering Works.

Metropolitan Edison Co., Reading, Pa., a 10-ton, 1-motor crane from the Roeper Crane & Hoist Works.

American Ice Co., New York, a 5-ton, hand power crane from the Roeper Crane & Hoist Works.

The Hudson Wire Co., 62 North Water Street, Ossining, N. Y., has awarded a contract to the McClintic-Marshall Co., Pittsburgh, for a one-story plant, 100 x 150 ft., estimated to cost about $50,000. Charles Royle heads the company.

The Montauk Mfg. Co., 841-43 Union Street, Brooklyn, manufacturer of talking machines, parts, etc., is planning for the installation of new equipment in its machine shop.

Parker Axles, Inc., Gotham National Bank Building, Fifty-ninth Street and Broadway, New York, will commence the immediate erection of the superstructure of its new one and two-story plant, 100 x 160 ft., at Poughkeepsie, N. Y., for the manufacture of automobile axles.

The Kewanee Boiler Co., 47 West Forty-second Street, New York, has filed plans for two one-story buildings, each 24 x 50 ft., on 141st Street, near Walnut Avenue, for local branches of the main factory at Kewanee, Ill.

The Car Lighting & Power Co., 61 Broadway, New York, has arranged for a preferred stock issue of $1,000,000, the proceeds to be used for plant construction and expansion. The company will build an ice manufacturing plant, and will make extensions and improvements in existing ice manufacturing units.

The Electric Supply & Equipment Co., 103 Allyn Street, Hartford, Conn., will soon commence the erection of a new plant on Broadway, Albany, N. Y., four-stories, 40 x 65 ft., estimated to cost $50,000.

The New York office of the American Lamp Co., recently mentioned in these columns, is at 30 Church Street. The officers are William H. Young, president; Walter L. Tremper, treasurer, and Harold A. Young, secretary. The company maintains a factory at Mianus, Conn.

The Utica Motor Car Co., Genesee Street, Utica, N. Y., is taking bids on a general contract for an addition to its service and repair works, estimated to cost about $100,000. Linn Kinne, Mayro Building, is architect.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until Sept. 8 for oil pumps, wrenches and spares, as set forth in schedule 131; also for oil purifier, heater and spares, as specified in schedule 129; two oil separators and spares, schedule 130; and for six fuel oil heaters and spares, schedule 132, all for the Brooklyn Navy Yard.

Joseph Pearlbinder, 1428 Bryant Avenue, New York, is taking bids for a one-story automobile service and repair building, 100 x 300 ft., on Westchester Avenue, estimated to cost about $100,000. Charles Kreymborg, 2534 Marion Avenue, is architect.

The Air Reduction Sales Co., 342 Madison Avenue, New York, manufacturer of acetylene welding apparatus, etc., has tentative plans under consideration for the erection of a new plant at Buffalo.

The Baltimore & Ohio Railroad Co., division operating offices, St. George, S. I., has plans in progress for the electrification of the entire system of the Staten Island Rapid Transit Co., its subsidiary organization. The work will include power houses and substations, with electric equipment, lines, etc. E. W. Murray is manager of he subsidiary company.

The Rubel Coal & Ice Corporation, Glenmore Avenue, Ozone Park, Brooklyn, will commence the erection of a new two-story ice-manufacturing plant, 34 x 116 ft., on Ocean Avenue, Ozone Park, to cost about $200,000 including machinery. Edward M. Adelsohn, 1778 Pitkin Avenue, Brooklyn, is architect.

Officials of the Texas Co., 17 Battery Place New York, have organized the Texas Producers' Co., as a subsidiary organization, capitalized at $1,000,000, to handle production in the Northwestern part of the country. Following the securing of leases, etc., for which negotiations are said to be under way, refineries and distributing plants will be established. Headquarters will be at Denver, Col., and Casper, Wyo.

Excavations will be placed under way at once, for a one-story power house for the Teachers' College, Columbia University, New York, in connection with a new library building on 120th Street.

The Kovat & Knauber Iron Works, 800 Edgewater Road, New York, are making inquiries for an air compressor of about 100 cu. ft., electrically operated.

Power equipment, conveying apparatus and other mechanical equipment will be installed in the three-story plant, 45 x 100 ft., to be erected at Hopkins and Atlantic Avenues, Brooklyn, for the Great Atlantic & Pacific Tea Co., 150 Bay Street, Jersey City, N. J., estimated to cost $65,000. L. S. Beardsley, 116 West Thirty-ninth Street, New York, is architect.

Fire, Aug. 30, caused by an explosion, destroyed a portion of the power house at the paperboard manufacturing plant of R. R. McEwan & Sons, Malapardis, near Morristown, N. J., with loss estimated at close to $35,000. The plant will be rebuilt.

The City Commission, Jersey City, N. J., has authorized a bond issue of $1,500,000 for the construction of a sewage disposal plant near Boonton, N. J., to include power equipment, electrical apparatus, mechanical gates, etc. Clyde Potts, 30 Church Street, New York, is consulting engineer.

The J. S. Mundy Hoisting Engine Co., 696 Frelinghuysen Avenue, Newark, has filed plans for a one-story building, 40 x 100 ft.

The Cole Motor Car Co., 1848 Broadway, New York, has acquired the works and business of the Wallace Motor Co., 894 Broad Street, Newark, including the service and repair department at 8 Green Street, which will be arranged as a direct factory branch of the main plant at Indianapolis.

Electrical and mechanical equipment, power apparatus, etc., will be installed in the new plant, 40 x 145 ft., to be erected at Blanchard Street and the Passaic River, Newark, by the Alcohol Products Co., now operating in this section. Fred A. Phelps, Union Building, Newark, is architect and engineer.

Chicago

CHICAGO, Sept. 4.

ALTHOUGH new inquiries for machine tools are fewer, considerable pending business is being closed for the reason, no doubt, that buyers wish to have their orders entered before prices advance. Some lines of machines have already gone up and others are scheduled to advance in the near future. A notable spurt in sales of turret lathes preceded an advance of a certain make which became effective Sept. 1. Orders are likewise being brought to a head in other lines which will go up the middle of this month. The King Machine Tool Co., Cincinnati, will advance boring mills about 10 per cent, effective Sept. 16. A Central Western manufacturer of engine lathes and shapers will also mark up prices about 10 per cent on Sept. 15. Among price changes already made may be mentioned an advance in shapers by the Ohio Machine Tool Co., which varied in percentage according to different sizes. The South Bend Lathe Works, South Bend, Ind., announces the discontinuance of its June 1 prices and the return to the quotations of March 7. This amounts to an advance averaging about 17 per cent.

No further railroad buying has taken place, but the Burlington is expected to buy against its pending machine tool lists within a week or two. The Santa Fe has given no indication that it would purchase the remainder of the list which was partially bought some time ago, but in view of the advancing tendency of machine tool prices, such action would not be surprising. It is also possible that the Chicago, Milwaukee & St. Paul will close for a small outstanding list and that the Rock Island may decide to buy certain equipment which it has been considering for several months. Among industrial companies the automotive concerns are the most prominent purchasers. The Studebaker Corporation has placed a second order for special piston turning lathes. The Nash Motor Co. is expected to close for considerable special purpose machinery for its Milwaukee plant some time this month. Among other classes of users, the International Harvester Co. has closed for four thread-milling machines, a number of turret lathes and several special purpose machines. From the standpoint of sales, August was a satisfactory month, in the case of one dealer being the best month this year and for others on a par with or slightly under July.

Whereas the Burlington has not yet taken action on its machine tools, it has commenced to place its crane equipment. An order has been given to the Whiting Corporation for two 125-ton electric overhead traveling cranes, each with 97-ft. 5½-in. span, one 125-ton hoist and one auxiliary 15-ton hoist. The Public Service Co. of Northern Illinois has awarded a 100-ton overhead electric traveling crane for a new power-house at Waukegan, Ill., to the Whiting Corporation.

The Shafer Bearing Corporation, 4500 Ravenswood Avenue, Chicago, manufacturer of automobile accessories, has purchased the plant of the All-American Truck Co., 6501 Grand Avenue, to provide for expansion. The property covers 8½ acres and includes a one-story building containing 66,000 sq. ft.

The Red Top Steel Post Co., 38 South Dearborn Street, Chicago, has purchased the factory property in Chicago Heights, Ill., formerly owned by the Chicago Pneumatic Tool Co., and in 1919 sold to the Giant Truck Corporation of Delaware.

Fire recently destroyed a two-story warehouse of A. M. Castle & Co., iron and steel jobber, Blackhawk and North Branch Streets, Chicago. The loss will exceed $100,000, of which $40,000 is represented by a hydraulic press which was destroyed.

The reported sale of 80 acres to the Ford Motor Co. in the Calumet industrial district of Chicago by the Chicago & Calumet Canal & Dock Co. has been emphatically denied by a representative of the latter company. Although agents of the Ford company have been looking over the property, no sale has been consummated.

The Pullman Co., 79 East Adams Street, Chicago, manufacturer of railroad cars, trucks, etc., is taking bids for a new one-story foundry, 300 x 500 ft., at Pullman, Ill., estimated to cost $40,000, exclusive of equipment. Frank D. Chase, Inc., 645 North Michigan Avenue, is architect and engineer.

A vocational department will be installed in the new North high school to be erected on Twenty-fourth Street, Omaha, Neb., estimated to cost $750,000, for which bids will be asked this month. John Latenser & Sons, Peters Trust Building, are architects.

The Hot Springs Water, Light & Power Co., Hot Springs, S. D., has plans under way for a new power house, to replace a generating plant recently destroyed by a flood. The installation will comprise two 450-kilowatt generators, waterwheel, pumping equipment and auxiliary machinery. The Hollister Engineering Co., Bankers' Life Building, Lincoln, Neb., is engineer.

Kang & Zeisler, South Schuyler Avenue, Kankakee, Ill., will soon take bids for a two-story and basement automobile

service and repair building, 81 x 145 ft., to cost about $55,000. C. K. Henry, 219 Arcade Building, is architect.

The Quartermaster Department, Chicago General Intermediate Depot, Chicago, will take bids until Sept. 14 for one gasoline pump, as specified in circular 23-27 RS.

William Driscoll, Olivia, Minn., is completing plans for a new one-story machine shop. A list of equipment is also being arranged.

The W. H. Maze Co., Peru, Ill., manufacturer of metal specialties, has construction under way on a one-story addition, 75 x 140 ft., estimated to cost $60,000.

A vocational department will be installed in the new two-story and basement high school, 96 x 120 ft., to be erected at Braham, Minn. G. L. Lockhart, Inc., 1643 University Avenue, is architect.

Philadelphia

PHILADELPHIA, Sept. 5.

A TWO-STORY machine shop at 1528-48 North Fifth Street, to cost about $42,000 will be erected by the James H. Billington Co., 113 Chestnut Street, Philadelphia, mill supplies.

The Philadelphia Electric Co., Tenth and Chestnut Streets, Philadelphia, has completed plans for additions to its power houses at American Street and Susquehanna Avenue, and on Ontario Street. Work has been commenced on two new power houses at other locations. W. H. Johnson, senior vice-president, is in charge.

Officials of the Baldwin Locomotive Works, 500 North Broad Street, Philadelphia, have organized the Cuba Locomotive & Machine Works, as a subsidiary organization, to construct and operate repair shops in Cuba.

Henderson Brothers, Twenty-fifth and Spruce Streets, Philadelphia, have awarded a contract to the J. H. Hunkle Co., Twenty-fifth and Delancey Streets, for a two-story automobile service and repair building, 40 x 118 ft., with one-story extension, 30 x 115 ft., estimated to cost about $100,000.

The Fidelity Machine & Mfg. Co., 4015 Paul Street, Philadelphia, has construction under way on a new machine shop and mechanical works at 3936-40 Frankford Avenue to cost about $70,000, including machinery.

The Pennsylvania Railroad Co., Broad Street Station, Philadelphia, is completing plans for the conversion of the engine house at its Altoona, Pa., shops, now being used as a freight car shop, into a locomotive repair works. Plans are also in preparation for new machine and erecting shops on the site of engine house No. 3. At the Juniata, Pa., shops, work will soon commence on a new machine shop and erecting works, 340 x 675 ft.; the present locomotive shops here will be extended and improved, including the installation of additional equipment. Plans have also been completed for a new three-story service and store house building, 60 x 400 ft., at the same point.

The Bureau of Supplies and Accounts, Navy Department, Washington, will take bids until Sept. 19 for four tractors for use at the Philadelphia Navy Yards, as set forth in schedule 127.

Thomas J. Luttrell, Philadelphia, operating a sheet-metal working and heating equipment shop at 3830 Market Street, has plans under consideration for a new one-story works.

The Hoffman Henon Co., Finance Building, Philadelphia, architects, have plans under way for a new automobile service and repair building, 50 x 160 ft., at 1229 North Broad Street, estimated to cost about $200,000. The name of the owner will be announced later.

The General Asphalt Co., Land Title Building, Philadelphia, affiliated with the Royal-Dutch-Shell Co., will build a pipe line from its oil fields in the Mene Grande district, near Lake Maracaibo, Venezuela, to a distributing point on the Atlantic Ocean, estimated to cost about $1,000,000, including pumping plants, pipe, and other mechanical equipment.

A high-pressure steam plant, electric generators, and auxillary equipment, ice-making and refrigerating apparatus, and miscellaneous power equipment, will be installed in the new power plant to be constructed at the State Normal School, Trenton, N. J., for which bids on a general contract are being taken. The Commissioner of Education, State House, is in charge. Gilbert & Betelle, 546 Broad Street, Newark, N. J., are architects.

The Atlantic Woodworking Co., 2320 Fairmount Avenue, Atlantic City, N. J., has plans under way for a new two-story plant, 45 x 70 ft., on Island Road.

The Penn Central Light & Power Co., Altoona, Pa., has arranged for a bond issue of $167,000, a portion of the proceeds to be used for extensions and improvements.

Tilghman Yager, Dorneyville, Pa., will soon take bids for the construction of a two-story automobile service and repair building, 60 x 110 ft., estimated to cost close to $70,000. Charles W. Gossart, 603 Hamilton Street, Allentown, is architect in charge.

The Lehigh Portland Cement Co., Allentown, Pa., has preliminary plans for a new cement mill at East Birmingham, Ala., totaling about 250 acres. The new mill will have an annual capacity of 1,000,000 barrels, and is estimated to cost in excess of $500,000, with machinery.

The Monitor Bi-Loop Radiator Co., Lancaster, Pa., manufacturer of radiators and kindred specialties, will soon commence the erection of an addition, to provide increased floor area of about 25,000 sq. ft.

The Peerless Folding Box & Crate Co., Columbia, Pa., is planning for the construction of a new one-story factory, 50 x 200 ft., to cost in excess of $40,000, with machinery. F. S. Sheeman, Swank Annex, Johnstown, Pa., is architect and engineer.

The Advance Rumely Co., Laporte, Ind., manufacturer of agricultural implements and equipment, has acquired property on South Cameron Street, Harrisburg, Pa., 130 x 150 ft., for a factory branch. Work will commence in September.

The Hanover Power Co., Scranton, Pa., has arranged for a bond issue of $75,000, to be used in part for extensions and improvements.

A vocational department will be installed in the new two-story high school, 90 x 135 ft., to be constructed at Nazareth, Pa., estimated to cost about $95,000, for which foundations are being started. Rasmussen & Wayland, 1133 Broadway, New York, N. Y., are architects.

The Stewart Artificial Ice Co., Williamsport, Pa., will commence the immediate erection of a new one-story ice manufacturing plant, 35 x 75 ft.

Fire, Aug. 28, destroyed a portion of the plant of the Scranton Electric Steel Co., Scranton, Pa., comprising a part of the former works of the Spencer Heater Co. An official estimate of loss has not been made. It is planned to rebuild.

The Metropolitan Edison Co., Reading, Pa., is concluding negotiations for the purchase of the plants and properties of the York Haven Water & Power Co., and the York Haven Electric Transmission Co., both of York Haven, Pa. Extensions and improvements will be made. The company has arranged for a preferred stock issue of 28,186 shares, a portion of the proceeds to be used in connection with the expansion.

Buffalo

BUFFALO, Sept. 5.

THE Robertson-Cataract Electric Co., Mohawk and Elmwood Avenues, Buffalo, operating the Robertson Electric Construction Co., manufacturer of switchboard equipment and other electrical apparatus, has arranged for an issue of preferred stock, the proceeds to be used for extensions, improvements, and additions to working capital. James D. Robertson is president.

The Watson Mfg. Co., 63 Taylor Street, Jamestown, N. Y., manufacturer of steel sash, metal screens, etc., is planning the erection of a four-story addition.

The W. A. Case & Son Mfg. Co., 31 Main Street, Buffalo, manufacturer of boilers, heating equipment, etc., has called a special meeting of stockholders, Sept. 7 to arrange an increase of capital of $2,500,000, a portion of the proceeds to be used for extensions and improvements. Joseph P. Fell is president.

The Keystone Tool & Metal Co., 56 Oak Street, Buffalo, has tentative plans under consideration for the erection of an addition.

The Webster Fruit Growers' Co-Operative Association, Lake Road, West Webster, N. Y., will commence the erection of a four-story ice and cold storage, and packing plant, 90 x 110 ft., estimated to cost about $150,000. George W. Dunn is in charge.

The Dittmer Gear & Mfg. Co., Grand Street, Lockport, N. Y., has preliminary plans under way for an addition to its plant.

The Chautauqua Association, Colonade Building, Chautauqua, N. Y., has plans for the erection of a new automobile service and repair works, in connection with a garage with capacity of 500 cars, to replace the building recently destroyed by fire. C. S. Arnold is in charge. It will cost about $55,000.

A vocational department will be installed in the new three-story high school to be erected at Orchard Park, N. Y. Colson & Hudson, 35 Dun Building, Buffalo, are architects.

The Ulrich Plan File Co., 516 West Fourth Street, Jamestown, N. Y., manufacturer of office equipment, has filed plans for a one-story factory on Murray Avenue, estimated to cost $25,000.

The Rectograph Co., 282 Hollenbeck Street, Rochester, N. Y., manufacturer of photographic devices and appliances, is planning the erection of a one-story addition.

A vocational department will be installed in the new three-story school to be erected at Boonville, N. Y., to replace a structure recently destroyed by fire, to be 110 x 142 ft. and estimated to cost close to $200,000.

The J. Spaulding & Sons Co., 484 Broome Street, New York, manufacturer of fiber products, is said to be arranging a list of machinery for installation at its new plant at Tonawanda, N. Y., on which work has been commenced. It will comprise two one and two-story buildings, 108 x 300 ft., and 60 x 200 ft., estimated to cost about $250,000. George F. Hardy, 309 Broadway, New York, is engineer.

The Ralph Gypsum Co., LeRoy, N. Y., is planning for the installation of new machinery and equipment at its properties.

Detroit

DETROIT, Sept. 4.

THE American Car & Foundry Co., 5718 Russell Street, Detroit, is taking bids for a one-story addition, 165 x 275 ft., to be partly equipped as a valve manufacturing department. Headquarters are at 165 Broadway, New York.

The Gray Motor Co., Mack and Railroad Streets, Detroit, manufacturer of automobiles, will commence the erection of a one-story unit, 60 x 600 ft., adjoining a new one-story extension, 60 x 400 ft., just completed. It is planned to build other units in the near future, providing for a daily production of 200 completed cars. F. L. Klingensmith, formerly connected with the Ford Motor Co., heads the organization.

The Eagle Ottawa Leather Co., Grand Haven, Mich., will install new mechanical stokers and other equipment in its power house. Cahill & Douglas, 217 West Water Street, Milwaukee, are engineers.

Fire, Aug. 24, destroyed a portion of the plant of the Standard Hoop Co., Bay City, Mich., with loss estimated at about $35,000, including equipment.

The Solar Polar Storm Sash & Screen Co., Muskegon Heights, Mich., has completed plans for a new one-story factory, to cost about $25,000. J. J. Gillman, connected with the Brunswick-Balke-Collender Co., Muskegon, Mich., heads the organization.

The Paige Motor Co., McKinstry Street, Detroit, has filed plans for a one-story steel addition, to cost $30,000.

The Hammond-Wieneke Co., 206 Court Street, Saginaw, Mich., will soon call for bids for a new one-story and basement automobile service and repair building, 80 x 100 ft., estimated to cost about $55,000. J. F. Beckissinger, 114 South Jefferson Avenue, is architect.

The Common Council, North Muskegon, Mich., has approved a bond issue of $39,000 for the construction of a new municipal electrically-operated pumping plant. Plans will be prepared at an early date.

The Ruggles Truck Co., Bad Axe, Mich., will commence the immediate erection of a new plant, 80 x 160 ft., for the production of truck bodies, estimated to cost $35,000. Julius Kirby is president.

The following buildings will be erected at Flint, Mich., for the Durant Motor Car Co., for the production of the Flint Six: Main building, 80 x 900 ft., three stories; plant No. 4, 400 x 80 ft., three stories; plant No. 5, 257 x 400 ft., one story; plant No. 6, 100 x 500 ft., one story. A power house to be erected will be known as plant No. 7. The Christman Construction Co., Lansing, Mich., has been awarded the contract.

Baltimore

BALTIMORE, Sept. 5.

PRELIMINARY plans are in progress by the Potomac Public Service Co., Hagerstown, Md., for a hydroelectric power house on the Cacapon River, at Edes Fort, Morgan County, W. Va. The installation will comprise about 30,000 hp. capacity, and with transmission system is estimated to cost close to $2,500,000. The company is operated by the American Water Works & Electric Co., 50 Broad Street, New York.

H. S. Block, Edgar and Cathedral Streets, Baltimore, has revised plans for a three-story addition, 42 x 125 ft., to his automobile service and repair works, estimated to cost about $100,000. J. E. Moxley, Jr., Equitable Building, is architect.

The Red "C" Oil Mfg. Co., Keyser Building, Baltimore, has tentative plans for rebuilding the portion of its plant at Lawrence Street and the Key Highway, recently destroyed by fire with loss estimated at $100,000.

The Bureau of Supplies and Accounts, Navy Department, Washington, will take bids until Sept. 19, for 21 ventilating sets and spare parts, schedule 126; also for 19,500 ft. of electric cable, schedule 128.

The Bureau of Yards and Docks, Navy Department, Washington, is taking bids until Sept. 13, for a new hangar, with repair facilities at the Naval Air Station, Anacostia, D. C., as set forth in specification 4691.

The Mutual Cold Storage & Refrigerating Co., Broadway, Va., is completing plans for a new four-story ice and cold storage plant, 75 x 150 ft., estimated to cost abou $150,000. E. H. Mosher, Munsey Building, Washington, D. C., is architect and engineer.

The Republic Boiler & Radiator Co., Union Avenue, Woodbury, Baltimore, has awarded contract to Claiborne Johnston & Co., Garrett Building, for two one-story buildings, 60 x 150 ft., and 20 x 150 ft., respectively, to cost $50,000 William C. Ceown is engineer in charge.

George C. Sheehan, Asheville, N. C., has acquired property at Fletcher, N. C., for a new plant to manufacture brick and kindred products. The initial works will cost about $55,000.

The Southern Steel Products Co., Fourth and Bainbridge Streets, Richmond, Va., is planning for the installation of bar benders, and kindred equipment, at its plant.

The Chief Signal Officer, United States Army, Washington, will receive bids until Sept. 25, for two 80-ft. steel radio towers, to be erected on the United States Military Reservation, Montgomery Intermediate Depot.

Warren W. Biggs, 1310 Fourteenth Street, N.W., Washington, has awarded a contract to the W. P. Lipscomb Co., District National Bank Building, for a new two-story automobile service and repair building, 75 x 180 ft., estimated to cost about $100,000. E. H. Mosher, Munsey Building, is architect.

The Richmond, Fredericksburg & Potomac Railroad Co., Broad Street Station, Richmond, Va., has awarded a contract to the Arnold Co., 105 South La Salle Street, Chicago, for new locomotive repair shops and engine house at Richmond to cost about $200,000 with equipment. E. M. Hastings is chief engineer, in charge. Plans have been completed for two new locomotive coaling plants. Each structure will be equipped with five 15-ton steel hoppers with elevating equipment, sanding apparatus, etc., with capacity of about 200 tons per hour and will cost in excess of $190,000.

Frank B. Essex, Washington, has awarded a contract to the R. P. Whitty Co., Union Trust Building, for a four-story automobile and service building, 50 x 105 ft., at 1509 Fourteenth Street, N.W., estimated to cost $70,000.

The Herfurth Engine & Machinery Co., Camden, S. C., is making inquiries for a 75-hp. oil engine; also for an ice-making machine, inclosed belt-driven type.

The Western Paper Makers Chemical Co., Kalamazoo, Mich., has acquired property at Savannah, Ga., and plans the construction of a new paper mill, estimated to cost in excess of $500,000, with machinery. A rosin refining plant will also be established.

The Richmond Pressed Metal Works, Sixth and Stockton Streets, Richmond, Va., plans the installation of new metal-working equipment. S. M. House is in charge.

The Standard Electric Co., 1821 East Main Street, Richmond, Va., operating a repair works, will install new equipment at its plant.

Thomas & Fulford, 336 Smith Avenue, Thomasville, Ga., have acquired a local building for the establishment of an automobile service and repair works. The structure will be remodeled. T. H. Fulford is in charge.

Indiana

INDIANAPOLIS, Sept. 4.

REVISED plans have been prepared by the Paramount Wheel & Engineering Co., Hartford City, Ind., for its new factory to manufacture steel automobile wheels, which will increase the works and expenditure over the amount originally planned. The company was organized recently with a capital of $300,000.

The American Gas & Electric Co., 30 Church Street, New York, has acquired a controlling interest in the Indiana & Michigan Electric Co., South Bend, Ind., and will operate the property in conjunction with its other electric utilities in this section. Extensions and improvements are planned.

The Faulkner-Burge Packing Co., Railroad Avenue, Marion, Ind., is planning to rebuild its power house partially destroyed by fire Aug. 16, with loss estimated at $25,000, including a portion of the warehouse, adjoining.

The Falls City Hydraulic Brick Co., Jeffersonville, Ind., is planning for the installation of new machinery. Robert Akers is superintendent in charge.

The Olin Sales Co., 315 North Meridian Street, Indian-

apolis, is taking bids on a three-story automobile service and repair works, 60 x 195 ft. estimated to cost $150,000. Walter G. Olin is president.

The Sterling Products Co., Evansville, Ind., operating a local ice-manufacturing and cold storage plant, has tentative plans under consideration for the establishment of a branch works to manufacture refrigerators and refrigerating equipment. The company was reorganized recently with a capital of $400,000. O. A. Klamer is president, and Charles F. Hartmetz, secretary and treasurer.

New England

BOSTON, Sept. 4.

SALES of machine tools in this district the past week were again restricted, due to the vacation period and to the holiday. There was, however, a slight increase in sales over last week, particularly of used tools. The local trade attaches considerable significance to several new inquiries which are in the nature of private negotiation and it is felt that September will see quite a revival in business. Individual inquiries developing the past week, in all but two or three instances, concern new tools and the aggregate showing is encouraging. Inquiries for used tools include a list of 20 presses and another a considerable amount of bending and rolling equipment.

Sales since last reports include a new cold saw having 12-in. and 36-in. diameter blades, purchased by an eastern Connecticut concern; a new multiple drill and a disk grinder by an East Boston firm; a fairly large new shear by a Worcester mill; a 18 in. x 6 ft. Flather lathe by a North Andover, Mass., manufacturer; and about a dozen used tools, of which a universal milling machine, taken by a local textile interest, is the most costly. A local manufacturer in the market for used Acme machines and Brown & Sharpe grinding equipment has been unable to locate these tools which emphasizes the fact that certain kinds of used machinery are practically unobtainable in this section. An export inquiry for a new large lathe and radial drill, which has been in this market for some time, has been transferred to New York, West Indies Sugar Finance Corporation, 129 Front Street.

The demand for small tools and machine parts has fallen off. Consumers apparently are buying from month to month, orders placed in this market semi-monthly indicating this condition.

Bids close this week for a proposed two-story, 30 x 142 ft. machine shop and administration building, contemplated by the Fall River Water Department, Fall River, Mass.

The Fred T. Ley Co., Springfield, Mass., has the contract for the first manufacturing unit of the new Wico Electric Co., West Springfield. It calls for completion by Jan. 1.

The Buol Machine Co., New Britain, Conn., special machinery and general machine shop business, is being organized and manufacturing quarters have been secured in the rear of 168 Arch Street. Abraham Buol, for many years superintendent New Britain Machine Co. is at the head of the company.

The Erwin M. Jennings Co., 27 Harrison Street, Bridgeport, Conn., will build a garage and service station 51 x 152 ft., on West Avenue, Norwalk, Conn. Repair equipment will be installed.

The Sieman Hard Rubber Corporation, Bridgeport, Conn., has awarded a contract to John R. Sheehan, Bridgeport, for a new one-story plant, 60 x 167 ft.

The Hood Rubber Co., Nichols Avenue, Watertown, Mass., manufacturer of automobile tires, has awarded contract to William H. Illiffo, Bailey Road, for a two-story addition, 96 x 210 ft., estimated to cost $75,000.

The Marmon-Boston Co., Boston, recently organized by officials of the Nordyke & Marmon Co., Indianapolis, manufacturer of automobiles, has leased property at Commonwealth Avenue and St. Paul Street, totaling about 40,000 sq. ft., as a factory branch.

The Automatic Refrigerating Co., 618 Capitol Avenue, Hartford, Conn., manufacturer of refrigerating machinery, has awarded contract to M. A. Conner, 668 Broadview Terrace, for a three-story addition, 53 x 95 ft. J. T. Henderson is engineer.

The Berwick & Salmon Falls Twin State Co., South Berwick, Me., will commence the construction of a new hydroelectric generating plant on the Great Works River, near South Berwick, estimated to cost $130,000.

The Cambridge Rubber Co., 748 Main Street, Cambridge, Mass., has awarded a contract to the Scully Co., Cambridge, for a four-story addition, 85 x 102 ft.

A vocational department will be installed in the new two-story high school to be erected at Conway, N. H., estimated to cost $100,000, for which work will soon be placed under way. C. R. Whitcher, Beacon Block, Manchester, N. H., is architect.

The Hartley Clock Co., Attleboro, Mass., has commissioned Monks & Johnson, 99 Chauncy Street, Boston, architects, to prepare plans for a new three-story factory, 60 x 240 ft., estimated to cost about $125,000.

The Electrolytic Iron Co., Bridgeport, Conn., will make extensions and improvements in the factory of Page & Nettleton, Milford, Conn., recently leased, and will soon commence the installation of equipment for the production of pure iron under a special process. The works will also include a complete laboratory.

A one-story power house addition, 30 x 50 ft., will be constructed by the Aeolian Co., Meriden, Conn., at its local factory.

Butterfield & Co., division Union Twist Drill Co., Derby, Line, Vt., manufacturer of taps, dies, reamers and screw plates is occupying its new brick and concrete fire proof buildings recently completed. The main factory building is 70 ft. x 170 ft. three stories and a basement, with annex one-story, 60 ft. x 170 ft. and basement, and an ell to the main building 70 ft. x 85 ft., three stories, all of the latest approved construction. This move has necessitated the purchase of considerable new equipment and machinery, and when completed gives the company nearly double its previous capacity, which is necessary to take care of growing business.

Milwaukee

MILWAUKEE, Sept. 4.

NEW business continues to develop slowly but steadily in the machine-tool trade, but it does not seem to get beyond the barest necessities. The strong trend toward hesitancy noted during the latter part of July and throughout August, due to the influence of the coal and roalroad shop strikes, has been relieved to some degree by the resumption of mining operations, although deliveries as yet are meager in volume and the fuel crisis is by no means past. Competition from used tools still exists, but is far less than earlier in the year. Construction of public garages and service stations throughout Wisconsin is more active than at any time in about two years and furnishes a good market for the lighter types of shop equipment, as well as for used tools, principally lathes.

The Allis-Chalmers Mfg. Co., Milwaukee, has broken ground for a one-story brick and steel manufacturing building, 175 x 400 ft., as an addition to the main works in West Allis. It will be devoted to the production of flour mill and sawmill machinery, and upon its completion about Jan. 1, the entire equipment of the present Reliance works in Milwaukee, will be transferred to the main plant. The Reliance works has been placed on the market.

The Behnke Vapor Burner Mfg. Co., Manitowoc, Wis., has been incorporated with a capital stock of $100,000 and will lease a building to manufacture heating devices using low grade fuel for installation in furnaces, boilers, stoves, etc. Albert J. Behnke is president; Adolph C. Behnke, vice-president, and Otto H. Behnke, secretary and treasurer. Patents were granted in 1913 but since that time no concerted effort has been made until now to place the Behnke vapor burner into quantity production for the market.

George Wheary, Racine, Wis., has resigned as vice-president and general manager Hartmann Trunk Co., to organize a new corporation with $500,000 capital stock which is equipping a factory in three floors of the Sattley Industrial Community Building, Racine Junction. It is planned to commence operations Jan. 1 with 200 operatives. The new concern will make wardrobe trunks and general traveling goods under patents granted to Mr. Wheary during nineteen years of association with the Hartmann company. Harry L. Burg, until now general Western sales manager Hartmann Trunk Co., is associated with Mr. Wheary in the new enterprise. Machinery is now being purchased.

The Minneapolis, St. Paul & Sault Ste. Marie Railway Co. is taking bids at the division headquarters, Rhinelander, Wis., for the construction and equipment of a new 20-stall roundhouse and a machine and locomotive shop at Gladstone, Mich., to replace the plant destroyed by fire in March. The investment will be in the neighborhood of $75,000.

The Hathaway-Buick Co., Oshkosh, Wis., has started work on a two-story garage, sales and service building, 60 x 70 ft., to be ready Nov. 1 and cost about $25,000, including equipment.

The Corona Pen Co., Janesville, Wis., a new $25,000 cor-

poration which will manufacture fountain pens, metal pencils, etc., will for the present conduct manufacturing operations in the plant of the Janesville Tool Co., owned by S. V. Corona and James Pitt, the principals in the new organization. A small list of equipment is being purchased.

Strong & Manley, automobile dealers and repairmen, Eagle River, Wis., has let contract to the Hub City Construction Co., Stoughton, Wis., for a garage and machine shop, 60 x 120 ft., part two stories and basement. It will cost about $20,000 completely equipped.

The Air Reduction Sales Co., New York, which recently purchased the former machine shop of the Petit Mfg. Co., at 1505 Buffum Street, Milwaukee, for the establishment of a new branch plant, will erect a brick and concrete addition, 30 x 80 ft., part two stories. The plant is scheduled to start operations Nov. 15.

The D. F. Murray Mfg. Co., Wausau, Wis., manufacturer of sawmill, pulp and paper mill machinery, advises it has placed all contracts for material and equipment for its new plant and is now out of the market.

The Milwaukee Steam Appliance Co., West Allis, which has been incorporated with $150,000 capital stock, represents a reorganization and consolidation of the interests of the Steam Appliance Co. and the Milwaukee Ice Machine Co., occupying jointly a large machine shop at 709-715 Sixty-third Avenue, West Allis. The complete lines manufactured by both companies will be continued. Charles H. John, formerly president and general manager Wisconsin Motor Mfg. Co., is president of the consolidated corporation.

The Service Auto Co., Clintonville, Wis., will start work in a few days on the erection of a new sales and service building, 50 x 120 ft., of which about 30 x 50 ft. will be set aside for machine shop purposes. A small list of new and used shop equipment will be purchased.

Pittsburgh

PITTSBURGH, Sept. 4.

MACHINE tool business in this district still is better in the promise than in the performance. Buying goes on with marked constancy, but sales of more than one tool to a buyer are exceptional and lists, except for estimating purposes, are very few. The price tendency is higher, due to the fact that stiff increases in costs are immediately ahead. It is pointed out that the quotations which have prevailed until the past few weeks bore very little relation to costs and were almost entirely the result of efforts by manufacturers and dealers to liquidate stocks. The wage increases just announced by the steel companies are bound to extend to the machine shops and attention now is drawn to the fact that in the wage revision which took place during 1921, skilled labor, which forms the bulk of that engaged in the manufacture of machine tools, was not called upon to take nearly as much of a reduction as was made in unskilled labor rates. It is a fact also, that a good many prospective plant improvements, involving machine tool purchases, have been held up because the money has not been available. It is believed that stocks of tools in first and second hands are pretty well cleaned up, at least to a point where they are not likely to offer much competition to new tools.

In cranes and other heavy equipment, inquiry is brisk and pending business is of large volume, but actual orders are not closing very rapidly. The order for three cranes for the Granite City, Ill., plant of National Enameling & Stamping Co., is expected to be placed soon and another live prospect is the Weirton Steel Co. sheet mill addition for which four cranes will be wanted. It is reported that the Jones & Laughlin Steel Co. is getting prices for estimating purposes on considerable equipment for its Pittsburgh steel works, and there are intimations that the recent placing of the contract for an addition of 366 ovens to the Clairton by-product plant, Carnegie Steel Co. is merely the first step in an extensive program of modernizing some of the Monongahela River plants of that company.

The Meadville Iron Co., Mill Street, Meadville, Pa., is taking bids for a one-story addition, 60 x 88 ft., to be equipped as an annealing plant. Shutts & Morrison, Marine Bank Building, Erie, Pa., are architects. Otto Kohler is president.

The Blystone Mfg. Co., Cambridge Springs, Pa., has awarded contract to the Austin Co., Cleveland, for a new plant, 90 x 260 ft., for the manufacture of concrete blocks, etc., estimated to cost close to $50,000.

Fire, Aug. 28, destroyed a portion of the plant of the Atlantic Bottle Co., Brackenridge, Pa., with loss estimated at about $300,000, including machinery. It is planned to rebuild. Headquarters of the company are at 90 West Broadway, New York.

The Gulf Refining Co., Frick Annex, Pittsburgh, has acquired property, 144 x 175 ft., bounded by Aloe, Mathilda and Gross Streets, as a site for the new oil works. The buildings on the property will be razed at once.

The Standard Steel Spring Co., Coraopolis, Pa., has inquiries out for a special steel crane, equipped with long hoisting drums and hooks on 12 ft. centers.

The D. N. Carlin Co., 125-27 Denniston Avenue, Pittsburgh, manufacturer of toys, has preliminary plans for an addition.

A vocational department will be installed in the new three-story and basement high school, 68 x 130 ft., to be erected at Beaver Falls, Pa. Carlisle & Sharrer, Jenkins Arcade, Pittsburgh, are preparing plans.

The Standard Seamless Tube Co., 313 Sixth Avenue, Pittsburgh, is planning the erection of a one-story addition at Ambridge, Pa., 80 x 480 ft.

A. Staab, Pittsburgh, has acquired the building, 86 x 185 ft., at 313-17 West Main Street for an automobile service and repair works.

A vocational department will be installed in the new high school to be erected at Tenth and Indiana Streets, Monaca, Pa., estimated to cost about $150,000, for which plans are being completed by J. H. Phillips, Fulton Building, Pittsburgh, architect.

The Koppel Car Repair Co., Koppel, Pa., is planning for the erection of an addition.

Carbocite, Inc., Huntington, W. Va., recently organized with a captial of $250,000, has acquired the plant and property of the Huntington Coal Distillation Co. Plans are under way for the construction of works to manufacture and refine coal by-products, estimated to cost in excess of $100,000 with machinery. S. J. Hyman is president, and R. D. Lamie, vice-president.

The Gulf States

BIRMINGHAM, Sept. 5.

A STRUCTURE has been acquired by the Hendry Machine & Engineering Co., Fort Myers, Fla., recently organized, for a boat-building and repair works. A department will be established for cylinder grinding work. W. F. Lusk is general manager in charge.

The Producers' Creamery Co., Fort Worth, Tex., will install an ice and refrigerating department in its proposed new plant, estimated to cost $75,000.

The Williams Yellow Pine Co., Poplarville, Miss., has tentative plans for rebuilding the portion of its mill destroyed by fire Aug. 25, with loss estimated at $100,000, including machinery.

The Electrolock Mfg. Co., Vicksburg, Miss., recently organized with a capital of $100,000 to manufacture locking devices for automobiles and other automotive equipment, is perfecting plans for the operation of a local factory. W. Hemingway, Jr., is president and genearl manager.

The Missouri, Kansas & Texas Railroad Co., St. Louis, is perfecting plans for the removal of its car and locomotive repair shops from DeLeon to Dublin, Tex., and will concentrate operations at the latter place. Enlargements will be made.

The Johnson Iron Works, Dry Dock & Shipbuilding Co., New Orleans, will commence the immediate installation of a new 5,000-ton dry dock, forming an additional section to dock No. 1, estimated to cost about $100,000, including equipment.

The Kosse Light & Power Co., Kosse, Tex., is planning for the installation of additional machinery. Enlargements will be made to increase the present capacity. H. E. Blumberg is head.

The Hernando County Dairy Co., Brooksville, Fla., will install an ice-making and refrigerating plant in connection with a new dairy to cost in excess of $60,000.

The Lee Lumber Co., Tioga, La., has plans for a new saw mill and lumber plant to cost about $100,000, including machinery.

Fire, Aug. 23, destroyed a portion of the plant of the Excelsior Brick Co., 1001 North McDonough Street, Montgomery, Ala., with loss estimated at about $35,000, including equipment. It is planned to rebuild. Frank Rhodes is president.

The Orlando Utilities Co., Orlando, Fla., will soon commence the erection of a new electric generating plant, 75 x 175 ft., to be operated in conjunction with a waterworks plant, estimated to cost about $300,000, including machinery.

The installation will comprise turbo-generators, boilers, electrically-operated pumps, and auxiliary machinery. George D. Moffatt, 140 Court Street, is general manager.

The Humphries-Pure Oil Refineries Corporation, Mexia, Tex., has plans for an electrically-operated pumping plant in the new Kosse, Tex., oilfields. A tank farm will be constructed with an initial capacity of about 110,000 bbl., with pipe line, distributing machinery, etc.

The Everglade Cypress Co., Loughman, Tex., has plans for the erection of new mills, 50 x 160 ft., and 30 x 65 ft., with initial capacity of about 50,000 ft. of lumber and 20,000 ft. of lath per day. The equipment will be provided with individual motor drive. A power plant will also be built. The entire project is estimated to cost in excess of $125,000. J. Wade Tucker, general manager, is in charge.

A. P. Jordan, Winters, Tex., is organizing a company to build and operate a refinery for gypsum products in the vicinity of Odessa, Tex. A site has been secured and plans are under way for the initial unit, estimated to cost $35,000 with machinery. Headquarters will be established at Odessa.

The Empire Fuel & Gas Co., Tulsa, Okla., operating oil refineries, a subsidiary of the Cities Service Co., 60 Wall Street, New York, has acquired the properties of the Planet Petroleum Co., near Wichita Falls, Tex. The new owner plans additions as well as extensive development work.

The Department of Public Utilities, St. Petersburg, Fla., will take bids until Sept. 11 for a new power plant, 70 x 120 ft. W. S. Shull, St. Petersburg, is architect.

The Ford Motor Co., Jacksonville, Fla., is arranging for the erection of an assembling plant and has selected a site. Slocum Ball is manager at Jacksonville.

The Biscayne Yacht & Machine Works, Miami, Fla., has plans under way for enlargements, and will install new machinery for the construction and repair of yachts and other light craft. S. Pearlman is general manager.

The Pacific Coast

SAN FRANCISCO, Aug. 29.

THE C. F. Braun Co., 604 Mission Street, San Francisco, manufacturer of heaters, valves, etc., will commence the erection of a branch factory at Shorb, Cal., 140 x 225 ft., to be equipped as a machine shop and foundry. Other units will be constructed at a later date.

The Southern Pacific Railroad Co., 65 Market Street, San Francisco, has arranged an appropriation of about $29,000,000 for extensions and betterments during the current year. Approximately $700,000 will be used for shop expansion and additional equipment.

The Newman High School District, Newman, Cal., will build a new one-story vocational shop at the high school. S. Wade is general secretary in charge.

L. D. Palmer, manager of the Orange County Fruit Exchange, and H. Warren Nice, secretary of the Chamber of Commerce, both of Orange, Cal., have organized a company to build and operate an ice-manufacturing and cold storage plant. A site has been secured and plans are being drawn for the first unit, estimated to cost $50,000. Mr. Palmer will be president.

The Utah Oil Refinery Co., Salt Lake City, Utah, a subsidiary of the Standard Oil Co. of Indiana, Indianapolis, has plans for additions in its Salt Lake refinery to increase the capacity from 5000 to 6000 bbl. of crude oil per day. The expansion will cost close to $600,000, including equipment.

The Birtschmann Ranch, operating near Antioch, Cal., is arranging for a series of electrically-operated pumping plants, with centrifugal and other pumping units, power equipment, etc., estimated to cost $100,000. Easley & Anderson, Antioch, are engineers.

The Jet Oil Refining Co., National City, Cal., will commence the immediate construction of a new refinery to specialize in lubricating oils.

The Crane Co., Los Angeles, with headquarters at 836 South Michigan Avenue, Chicago, is taking bids for a one-story building, 116 x 150 ft., on West Anaheim Road, Long Beach, Cal. W. Horace Austin, 222 First National Bank Building, Los Angeles, is architect.

A vocational department will be installed in the new high school to be erected at Mountain View, Cal., estimated to cost about $200,000. The Mountain View High School District is in charge. W. H. Weeks, 369 Pine Street, San Francisco, is architect.

The Republic Consolidated Mining & Refining Co., Mackay, Idaho, recently organized with a capital of $3,000,000, has plans under way for a new hydroelectric generating plant, in connection with a cyanide mill. W. P. Barton is in charge.

The Harold Furnace Co., Spokane, Wash., will commence the immediate erection of a new one-story factory estimated to cost $17,000.

The Willamette Iron & Steel Works, Portland, Ore., will make extensions and improvements in its one-story boiler shop, estimated to cost $40,000.

The Associated Lumber & Box Co., Dorris, Cal., has tentative plans for the rebuilding of the portion of its works destroyed by fire Aug. 17, with loss estimated at $150,000, including equipment.

A vocational department will be installed in the new high school to be erected at Heliz, near Pendleton, Ore., for which plans have been authorized by the Union High School District No. 1, Umatilla County, to cost close to $75,000. Raymond W. Hatch, Pendleton, is architect.

C. E. Taylor, Stayton, Ore., formerly head of the Stayton Light & Power Co., has acquired a power site and plans the construction of a new power house to serve Stayton, Aumsville, and vicinity. It is said that a company will be organized, headed by Mr. Taylor, to operate the plant and system.

The Little Rock Power & Water Co., Los Angeles, has made application for permission to use two power sites on Little Rock Creek, Los Angeles County, for the construction of two hydroelectric power plants, estimated to cost $350,000 and $300,000, respectively.

Cincinnati

CINCINNATI, Sept. 4.

A STIFFENING in prices marked the machine tool market the past week, and while no actual advances in list quotations have yet been made, it is probable that announcements will be forthcoming within the next few weeks. The practice of some dealers and manufacturers with large stocks of giving additional discounts has now entirely disappeared and the next step is expected to be a substantial increase in list prices.

While there were no outstanding sales during the week the aggregate was satisfactory, in view of prevailing industrial conditions. Included in orders booked were several machines for a can manufacturer, and a number of cranes for the Warner Elevator Co. The Ideal Concrete Machinery Co. was also a purchaser of a crane for its new plant and the Mitchell Steel Co. is expected to close on one crane this week. School business is making up quite a fair percentage of the business in lathes, scattered orders being reported from all sections of the country. A report is current that a Michigan industrial corporation has closed on equipment, including 90 presses and approximately 50 lathes, but confirmation is lacking.

The Buffalo-Springfield Roller Co., Springfield, Ohio, manufacturer of road rollers, is erecting an addition to be in better position to take care of repair work at Springfield. Formerly the bulk of the repair work was done in Buffalo. The Buffalo shop will be continued.

The finishing plant of the Standard Bolt Corporation, Columbus, Ohio, was damaged by fire on Aug. 29 with a loss of $75,000. It will be rebuilt.

The plant and equipment of the Elwood Iron Foundry Co., Elwood, Ind., has been sold to a company headed by Joseph G. Field, which plans to operate the works. The company recently was placed in the hands of a receiver.

The Master Tire & Rubber Co., Dayton, Ohio, has been reorganized with C. L. Cappel, president; R. S. Shuey, secretary, and C. W. Hoffritz, general manager. The new company, which is capitalized at $200,000, is now operating on a small scale, but plans to increase the output to 500 tires daily. It also plans to manufacture rubberized cloth in the near future.

The Hochstetter Research Laboratories Co., Dayton, Ohio, has been incorporated with a capitalization of $100,000 by Frederick Hochstetter, president; Hubert Estabrook, secretary, and Samuel L. Finn, treasurer. The company was organized for the purpose of scientific research and manufacture.

The Central South

ST. LOUIS, Sept. 4.

BIDS are being taken by the St. Louis Wire & Iron Co., 926 Chauteau Avenue, St. Louis, for a two-story and basement addition, 50 x 150 ft., estimated to cost $40,000. Theodore R. Piesler is president.

The Standard Machine Co., 311 Fifth Avenue, S., Nashville, Tenn., has plans under way for a new two-story machine shop.

The Watkins Mfg. Co., 200 North Waco Street, Wichita, Kan., manufacturer of automobile parts, has plans for a new branch factory in the East. It is said that negotiations are under way for a location in the vicinity of Syracuse, N. Y. C. A. Watkins is head.

The United States Zinc Smelting Co., Dewar, Okla., has plans under way for rebuilding its crushing and mixing departments destroyed by fire on Aug. 21. New equipment will be installed.

The Allen & Lee Mfg. Co., Union National Bank Building, Wichita, Kan., manufacturer of oil-burning equipment, is planning for enlargements and the installation of new tools.

A vocational department will be installed in the central high school to be constructed at Waverly, Tenn., estimated to cost in excess of $100,000. Dougherty & Gardner, Nashville, Tenn., are architects.

A one-story power house will be constructed by the City Hospital Association, Twenty-second and Cherry Streets, Kansas City, Mo. W. E. Gillham, 309 Mutual Building, is engineer.

The Federal Chemical Co., Nashville, Tenn., has tentative plans for rebuilding its sulphuric acid plant destroyed by fire, Aug. 28 with loss reported in excess of $1,000,000, including buildings and equipment.

L. O. Mitchell, Kansas City, Mo., operating a machine shop at 713-15 Central Street, plans for the installation of a number of new machine tools.

The United States Quartermaster, Fort Leavenworth, Kan., will receive bids until Sept. 9, for machine shop supplies, as set forth in circular 23-6.

The Blanchard & Campbell Coal Co., Harriman, Tenn., recently organized, has plans under way for the installation of electrical and mechanical equipment at its mining properties. N. C. Blanchard is president; and T. F. Campbell, secretary.

C. B. Wilson, 1212 Arlon Avenue, Wichita, Kan., is making inquiries for a lathe, drill press, and other machine shop equipment.

A vocational department will be installed in the new high school to be constructed at Rockwell, Tenn., estimated to cost close to $100,000, for which work will be placed under way at once. Manley & Young, Knoxville, Tenn., are architects.

The Universal Car Co., 2228 Oak Street, Louisville, has awarded contract to J. Besser & Co., 2142 Frankford Avenue, for a new one and two-story service and repair works at Twenty-fifth Street and Broadway, estimated to cost about $60,000.

The Common Council, Rich Hill, Mo., is arranging for the installation of new equipment at the municipal electric power plant. A bond issue has been arranged.

The Guarantee Repair & Construction Co., First and Waco Streets, Wichita, Kan., is planning for the installation of a number of machine tools, and other equipment. J. B. Phillips is in charge.

A vocational department will be installed in the new high school to be constructed at Coal Creek, Tenn., estimated to cost approximately $90,000.

The Cynthiana Carriage Co., Cynthiana, Ky., has plans under way for a branch factory at Covington, Ky. J. W. Leek heads the company.

The White Co., 2001 Grand Avenue, Kansas City, Mo., manufacturer of motor trucks, with plant at Cleveland, will commence work at once on the super-structure for its two-story and basement service and repair building, 100 x 250 ft., to cost about $100,000. Clifton B. Sloan, 321 East Eleventh Street, is architect.

A vocational department will be installed in the new one and two-story high school, 90 x 95 ft., at Kanopis, Kan., estimated to cost $75,000, for which plans have been completed by Charles W. Shaver, Salina, Kan., architect.

Canada

TORONTO, Sept. 4.

DEMAND for machine tools is slowly showing improvement and inquiries coming out indicate a heavier buying movement before the end of the month. The Canadian National Exhibition is renewing interest in the machinery market and buyers are paying keen attention to new lines, especially those for labor saving purposes. The outlook in the fuel situation, while still far from favorable, is improving and it is the general opinion that if coal supplies begin to make their appearance in increased quantities companies which have deferred purchases will commence buying on a more extensive scale. Another factor which is expected to have some bearing on the market is that the holiday season is about over and as a general rule business picks up about this time. Good crops are predicted and manufacturers of farm machinery look forward to a brisk demand for their products. The call for mining equipment is also more pronounced and machinery for electrical development purposes is in active demand. Woodworking machinery continues to lead the market in activity. Small tools and supplies are moving more freely.

W. S. Fenton, Port Elgin, Ont., is in the market for an engine lathe, about 12-ft. bed, back geared and compound rest.

The ratepayers of Milton, Ont., carried a by-law to loan Smith & Stone $40,000, in return for which the company will erect an addition to their plant for the manufacture of electrical supplies, etc.

The Keystone Watch Case Co., 15 Maiden Lane, New York, will establish a factory and distributing centre at Toronto to take care of Canadian trade. A six-story reinforced concrete factory will be erected on George Street, and building operations will begin within the next few weeks.

H. S. Cook & Co., have leased the foundry and stove department of the New Burrell-Johnson Iron Co. at Yarmouth, N. S., and will carry on a general foundry business.

Bids will be called immediately for the erection of a shingle mill to cost $74,000 for the Phillips-Hoyt Lumber Co., Burnaby, B. C.

Cleveland

CLEVELAND, Sept. 4.

LOCAL machine tool sales keep at about the recent volume. While business with some manufacturer fell off in August as compared with July, pending small lot inquiries indicated an improvement in sales this month. The American La France Co., Elmira, N. Y. during the week purchased 5 or 6 turret lathes from a Cleveland manufacturer and it is understood to have placed orders for a number of grinding, milling and other machines. The Ternsted Mfg. Co., Detroit, recently purchased 70 small punch presses. The Lima Locomotive Co., Lima, is expected to place orders within a day or two for about 25 machine tools for its plant extensions.

The price situation is still an important feature of the market and it is expected with increased costs machine tool manufacturers who have not already made advances will be forced to mark their prices up. Gould & Eberhardt announced an advance in varying percentages Sept. 1 on their line of shapers. Dealers are looking for advances on vertical boring mills about Sept. 15.

Pickands Mather & Co., Cleveland, have sent out the following list of metal and wood-working machinery required for their Zenith mine, Ely, Minn.

One 2-in. single head bolt and pipe cutter.
One 24-in. x 24-in. metal planer.
One vertical wood boring machine.
One power hack saw.
One 800-lb. steam hammer.
One 36-in. band saw.
One single cylinder surfacer.
One 6-in. pipe threading machine.
One 100-ton portable hydraulic press.

With the exception of the pipe threading and bolt cutting machine the company will give preference to used machinery.

The White Co., Cleveland, during the week took an order from New York City for 128 5-ton trucks.

The Johnston & Jennings Co., Cleveland, has purchased the business of the U. S. Molding Machine Co., and will manufacture the line of molding machines that has heretofore been made by the company.

The National Sanitary Co., Salem, Ohio, has commenced rebuilding its foundry, recently burned, and expects to place it in operation about Oct. 1.

The Youngstown Boiler & Tank Co., Youngstown, Ohio, will build a one-story, structural steel addition. The contract has been placed with the Niles Forge & Mfg. Co.

The Armington Engineering Co., Euclid, Ohio, is erecting a one-story steel frame factory addition, 34 x 100 ft., for assembling purposes.

NEW TRADE PUBLICATIONS

Spaders, Air Compressors and Coal Cutters.—Sullivan Machinery Co., 122 South Michigan Avenue, Chicago. Six bulletins, 70-X, compressed air spader; 77-D, portable air compressors; 79-C, "Ironclad" coal cutters for room and pillar and long wall mining; 79-D, "Ironclad" coal cutters for room and pillar mines; 79-E, long wall "Ironclad" cutters; 79-F, motors, driving gear, cutters and feed for "Ironclad" coal cutters. Well illustrated and containing tabular specification details and dimensions, these bulletins feature mining machinery for the production of coal.

Waugh-Sinclair Portable Compressor Plant.—Denver Rock Drill Mfg. Co., Denver, Col. A 16-page pamphlet devoted to portable air compressors for use in isolated locations or in city streets. Gasoline drive, rugged construction and adequate cooling of both engine and compressor cylinders are features. Tabular specifications are given of a 32-hp. size weighing, complete on its own truck, 9200 lb., and a 20-hp. size weighing 6800 lb. The bare truck, in each case, accounts for 1600 lb. of the total given.

Rolling Steel Shutters and Metal Shop Fronts.—S. W. Francis & Co., Ltd., 64-70 Gray's Inn Road, London, W. C. 1, England. A 48-page catalog of steel rolling shutters, wood lath shutters, spring roller shutters, awnings, metal work for store fronts, collapsible steel gates and sections of metal moldings and beadings, angles, channels, nosings, etc., both plain and backed by wood. Diagrams are freely used in showing construction, operation and clearances for both steel and wood-lath rolling shutters, and tables give the space requirements.

Metallic Packing for Condensers.—Crane Packing Co., 1800 Cuyler Avenue, Chicago. A 24-page pamphlet dealing with condenser tube packing problems and their solution. Special attention is paid to tube disintegration through electrolysis and to deformation and splitting of tubes, due to metal fatigue, abuse and other causes. Use of Crane metal packing rings, built of many spiraled layers of thin babbitt foil, is described and advocated.

Koerting Fuel-Oil Burning Systems.—Schutte & Koerting Co., Philadelphia. Volume 5, 84 pages, contains Bulletins 16 OA, mechanical oil-burning system; 16 OD, auxiliary apparatus for burning oil; 16 OG, Asko type oil-burning system; 16 OJ, steam and air pressure oil-burning systems; 16 OM, fuel oil, its properties and advantages. The bulletins are profusely illustrated, with the aid of colors and diagrams, sections and installation views. Tables of sizes and capacities are given, and discussions of engineering features of the various types of apparatus. Instructions for operation of oil-burning systems and apparatus are given. Combustion is treated separately.

The Fitzgibbon Boiler.—Fitzgibbon's Boiler Co., Inc., 47 West Forty-second Street, New York. A 16-page catalog of cylindrical fire-tube boilers designed for both power and heating. Tables of dimensions and capacities are given for both types of service and for differing power pressures. The boiler is internally fired and is constructed under the boiler code of the American Society of Mechanical Engineers.

Rayco Pulverized Coal Systems.—Raymond Brothers Engineering Co., 1315 North Branch Street, Chicago, Catalog No. 15, 32 pages. This describes complete engineering and manufacturing service for preparing, distributing and burning pulverized coal. One page, devoted in small type to the savings from the use of pulverized coal, as shown by experiences in 15 different plants, gives both a brief description of each installation and a definite measure on the results. These installations include annealing, puddling, forge, melting, heating and smelting furnaces and power plant boilers. A chart of the growth in the use of powdered coal shows a gradual increase from 1895 up to 5,000,000 tons consumption per year in 1917, jumping thence in four years to 30,000,000 tons per year.

Getting Business With Graphics.—Esterline-Angus Co., Indianapolis. A 4-page leaflet concerned with the possibilities of selling technical products with the aid of graphic records, assisting the customer to visualize the subject. The use of automatic records is featured, with specially graduated paper used in appropriate recording instruments.

Multiple Plate Friction Draft Gear.—Hall Draft Gear Corporation, Watervliet, N. Y. Two leaflets describing railroad draft gear with opposing steel gear housings inclosing and protecting friction plates, springs and other parts. Three sizes are made, besides special twin spring gears. Results of tests are given, showing resistance to distortion and damage. Car impact tests show the closing speed of the gear to be 5¼ miles per hour.

Reliance Steam Specialties.—Reliance Gage Column Co., 5902 Carnegie Avenue, Cleveland. Catalog M of 16 pages, describing safety water columns, electric alarms for water columns, seamless copper floats, water gages, gage cocks and steam traps. Illustrated by both halftones and diagrams, the catalog contains also tabular matter of value in connection with the use of the specialties described. One float which had been in service 28 years is shown.

Safety Car Equipment.—Reasons for the safety car described in Bulletin 44015 of the General Electric Co., Schenectady, N. Y., are improvement in service, increase in riding habit, lower maintenance cost, reduction in labor cost and in power consumption and freedom from accidents. The standard safety car most commonly used is about 28 ft. long and seats 32 passengers. The body is mounted on a single truck, with 26-in. wheels and wheel base of about 8 ft. Completely equipped, it weighs about 15,000 lb. It is of all steel construction and is built to a standard form and size.

Industrial Finances

The plant and equipment of the Barney & Smith Car Co., Dayton, Ohio, will be offered at sheriff's sale at Dayton, Oct. 10, 2 p. m. This is the second time the plant has been offered, no bids having been received on July 12. A reappraisal of the property has just been completed which reduced the appraised value of the plant by nearly one million dollars, to $2,273,708.87.

The Wickwire-Spencer Steel Corporation, Worcester, Mass., and Buffalo, has called a special meeting of stockholders Sept. 8 to vote on the acquisition of all the capital stock of the American Wire Fabrics Co., Chicago.

The directors of the Worthington Pump & Machinery Corporation at a recent meeting declared the regular quarterly dividends of 1¾ per cent on class A preferred and 1½ per cent on class B preferred stock, payable Oct. 1. No action was taken on the common stock dividend.

The Burton Engineering & Machinery Co., Spring Grove Avenue, Cincinnati, has been placed in the hands of a receiver. The company manufactures gasoline locomotives and other road-building machinery. The plant will be continued in operation.

The directors of the Reynolds Spring Co., Jackson, Mich. have declared a dividend of 1¾ per cent on the preferred A stock and preferred B stock.

The directors of the Crucible Steel Co. of America at a recent meeting declared the regular quarterly dividend of $1.75 on the preferred stock.

The Dayton, Toledo & Chicago Railroad, recently placed in the hands of a receiver, was bid in for $50,000 by William Stroop, Dayton, Ohio, tobacco dealer, at receiver's sale Aug. 24. It is understood that the new owner will spend approximately $500,000 in equipment for the road, the plans calling for five locomotives, 50 freight and passenger cars, and the relaying of rails on the greater part of the line.

The sale of 300,000 shares of Otis Steel Co. common stock at $11 a share to present shareholders, as proposed by the directors of that corporation, has been approved by stockholders.

Subscriptions to the new stock issue of the Lima Locomotive Works, Inc., have provided more than $3,300 000 cash, which is sufficient to finance half of a $3,000,000 construction program and to retire approximately $1,300,000 outstanding bonds.

For the six months ending with June, last, sales of the Winchester Repeating Arms Co., New Haven, Conn., amounted to $6,588,012, and net operating profits $403,343. Interest charges for that period amounted to $459,844, thus a loss of $56,501 was shown for the first half of the year.

The New York Air Brake Co. reports earnings for the first half of 1922 amounting to $309,507, after all charges, or the equivalent of $3.09 per share on $10,000,000 capital stock outstanding.

The net profit of the Keystone Steel & Wire Co. for the year ended June 30 was $412,047 and, after providing for all charges and federal taxes, the surplus was $29,540. The balance sheet as of June 30, last, showed total assets and liabilities of $8,649,787, and profit and loss surplus $178,081. Current assets, including $263,965 cash, were $2,014,191, compared with current liabilities of $319,496. No bank loans were outstanding.

Plans of New Companies

At a recent meeting of the Temple Furnace Co., Temple, Pa., a permanent organization was effected with Nils Anderson, president; G. A. Coulton, vice-president; C. A. Sleicher, treasurer, and H. Sellers, secretary. Repairs and improvements of the furnace at Temple, Pa., are being pushed rapidly in order to get the furnace in blast at an early date.

The Liberty Tool & Die Corporation, Rochester, N. Y., has been incorporated with a capital of $10,000 to manufacture machinery, tools, dies, etc. The directors of the company, all residents of Rochester, are: C. F. Mallick, 25 Pullman Avenue, C. M. Meyer and F. E. Wegner.

The J. D. Tire Jack Corporation, 15 Journal Square, Jersey City, N. J., is planning to start operations on the J. D. tire jack which it will manufacture under contract. This company is now receiving bids with a view to an early production date.

The Globe Steel Tubes Co., a reorganization of the Globe Seamless Steel Tubes Co., Milwaukee, was recently incorporated under the Delaware laws and will continue to manufacture the line handled by the old company. Its factories are at Milwaukee. The officers are: R. P. Lamont, chairman; P. J. Kalman, president; F. J. O'Brien, vice-president and general manager; G. O. Ross, secretary and treasurer.

The Brady Elevator Equipment Co., Inc., 95 Liberty Street, New York, recently incorporated for $1,000,000 under the Delaware laws, is now having its manufacturing done by contract until it starts operations in its new plant. It will do its own construction work and will continue to manufacture elevator door closers. The officers are T. Brady, president and general manager; L. G. Hagenbuch, secretary and treasurer.

The Defiance Auto-Lock Corporation, 836 Hamilton Street, Allentown, Pa., recently incorporated, will manufacture automobile radiators and other metal products. At the present time it is in the market to contract for brass and solder. The officers are: E. W. Reuber, president; R. H. Peterson, vice-president and general manager, and A. F. Landis, secretary.

The Universal Machine & Equipment Co., Greensburg, Pa., has been incorporated with a capital of $200,000 to manufacture machinery and parts. For the present its manufacturing will be done by contract.

The Marfield Radio Mfg. Co., New York, has been incorporated with a capital of $20,000 to manufacture wireless equipment and parts, chief of which is the Clarion radio horn. Manufacturing for the present will be done partly by contract. Epstein & Axman, 175 Fifth Avenue, represent the company.

Leo Schlesinger & Co., Inc., 64 Wooster Street, New York, has been incorporated with a capital of $100,000 to manufacture tinware and general metal goods. The new company will take over the business of Leo Schlesinger & Co., and contemplates expansion. Jenks & Rogers, 67 Wall Street, New York, represent the company.

The O. C. Jensen Machine Corporation, New York, has recently incorporated with a capital of $15,000, and will manufacture machinery and parts. Plans for manufacturing are yet undecided. F. Bien, 280 Broadway, New York, represents the company.

The Vulcan Radio & Electric Corporation, New York, has been incorporated with a capital of $100,000 to manufacture wireless equipment and parts. It will do its own manufacturing for the present. The company is represented by W. F. Ashley, Jr., 156 Broadway, New York. The incorporators are: C. S. Ashley, P. R. Bassett and T. O. Hall.

The Arrow Body & Wagon Works, New York, has been incorporated with a capital of $15,000 to manufacture automobile bodies. It is still in the process of organization and undecided as to the date of beginning operations. The incorporators are: H. Brown, H. Melnic and L. Rubin. The company is represented by R. H. Schenk, Aeolian Building, West Forty-second Street, New York.

The Progressive Iron Works, Inc., 104 Court Street, Reading Pa., was recently incorporated to do structural and ornamental iron and brass work. It has purchased equipment for a plant located in Reading, Pa., and has already started operations.

The Gorlov Heater Co., 34 South East First Street, Miami, Fla., has started operations in manufacturing several types of automatic water heaters. Most of its work will be let out to contract.

The International Chain & Mfg. Co., 1207 Vine Street, Philadelphia, recently incorporated, is a re-organization comprising the chain business of George J. Campbell, Philadelphia, and the Victory Chain & Mfg. Co., York, Pa. The factory at York will be enlarged to meet the requirements of the expansion, and new equipment will be needed for making certain lines of electric welded chain. The officers of the new company are: G. J. Campbell, president and general manager and J. L. Mueller, vice-president.

The Unique Brass Foundry Co., 833-841 Grant Street, Buffalo, recently incorporated, will manufacture storage batteries and parts. It has an equipped plant and is now manufacturing.

The King-Schultz Co., New York, has been incorporated to manufacture iron and steel products. Its plant is located at 351 East Thirty-third Street. The incorporators are: H. King, A. Schultz and S. Tobias.

The Gottwik-Scheffer Thermometer Co., New York, has been incorporated with a capital of $20,000, to manufacture thermometers and other instruments. It is looking for a plant of considerable capacity somewhere in Brooklyn and hopes to be able to transfer its equipment about Sept. 1. Its offices for the present are located at 15 Park Row. The incorporators are: J. E. Gottwik, and H. S. Scheffer, Sr. and Jr.

The Flower City Pipe & Iron Corporation, Rochester, N. Y., has acquired the iron yard formerly conducted by Coates, Bennett & Reidenbach, Inc., and plans to operate a general iron and steel business, specializing in pipe and pipe products. The plant is equipped to handle scrap, to cut, thread and refit used pipe, and to manufacture cellar columns, fence posts, etc. The officers of the company are: B. Rosenthal, president; R. H. Coates, treasurer and general manager and J. E. Gore, secretary.

The Brantford Computing Scale Mfg. Co., New York, was recently incorporated with a capital stock of $100,000, to manufacture scales. This company is a subsidiary of the Brantford Computing Scale Co., Ltd., Brantford, Ont., which expects to set up a number of distributing offices in the United States. An assembling plant is also being contemplated for the near future. It will probably be located in or near Buffalo. The incorporators are: W. Mendell, D. P. Ritchey and W. F. Donelly. The New York offices will be located at 30 East Forty-second Street.

The Udall & Landan Mfg. Co., 205 Lafayette Street, New York, has been incorporated with a capital of $20,000, to manufacture tools and other metal products. It will also do some repair work. The incorporators are: P. A. Udall, J. A. Landan and I. Hecker. Mr. Udall was mechanical engineer in charge of the Panama Canal Exhibit. The company will take over the business of J. A. Landan & Co., Inc., and plans to do most of its work at the present location, but some parts will be manufactured by contract.

The Smith-Hamburg-Scott Welding Co., New York, has been incorporated with a capital of $20,000, to manufacture metal products and to do general welding and repair work. The incorporators are: C. P. and L. W. Scott, and H. Sancier. Its offices will be located at 505 West Fifty-seventh Street.

The Hunter Saw & Machine Co., Fifty-seventh and Butler Streets, Pittsburgh, has opened an office at 56 Pine Street, New York, F. E. Harrison in charge; also at Manhattan Building, Chicago, P. W. Wendt in charge. Both offices will carry a complete stock of metal-cutting circular saw blades, pneumatic hammer rivet sets and chisel blanks.

The Celite Products Co., Ltd., New Birks Building, Montreal, Canada, has been established to market Sil-O-Cel and Filter-Cel as produced by the Celite Products Co., Chicago. Sil-O-Cel is a product used for the prevention of excessive heat loss from boilers, furnaces, etc. Filter-Cel is a filtering aid. L. Russel is manager of the Montreal office.

The Fire Pump & Equipment Co., 2237 Insurance Exchange Building, Chicago, recently organized, will do construction work throughout the United States. It has been buying machines to the extent of $8500 per month since May and will now buy from $5000 to $10,000 worth of machinery each month. It is also in the market for Duplex Underwriter Pumps. The officers of the company are: Edward Maher, president; E. G. Maher, secretary and treasurer and E. E. Maher, vice-president.

The George F. Foss Machinery Co., 174 Lafayette Street, New York, has been purchased by L. Cohan, Woodcrafts Equipment Co., and is being operated under the name Lafayette Machine Tool Co.

The Maxim Spark Plug Corporation, 2 Duane Street, New York, recently incorporated, is manufacturing a spark plug the main operation of which involves die casting. This phase of the work will be done by contract.

The Marion Electric Mfg. Co., 24 Cliff Street, Jersey City, N. J., has filed notice of organization to manufacture electrical products. It is operating in its own plant at the above address. A. B. Dittmar heads the company.

The Standard Lock Corporation, represented by Bond, Schoeneck & King, 421 Union Building, Syracuse, N. Y., was recently incorporated and will manufacture locks.

The Boiler & Radiator Corporation, 154 East Avenue, Rochester, N. Y., will act as representative for complete lines

of boilers, radiators, steam specialties and kindred lines, devoting particular attention to Kewanee heating and power boilers.

Consolidation of the Prima Radio Corporation, New York, and the Manufacturers Tool & Die Works, under the corporate title of the Prima Radio Corporation, has been announced. The capitalization of the new company is $50,000 in 8 per cent preferred stock of $10 par value and 1,500,000 shares of $1 par value common. William Schilling is president and Andrew E. Puckrin is chairman of the board of directors.

The McPhilben Corporation of New Jersey, Newark, N. J., has been incorporated with a capital of $25,000, to manufacture electrical equipment and parts. For the present it is doing jobbing business only, future developments depending upon the resumption of normal conditions. It does not expect to do its own manufacturing. Address H. Citrit, 747 Broad Street, Newark, N. J.

The Minden-Edgar Iron Works, Inc., Long Island City, N. Y., has been chartered under State laws to manufacture iron and steel products and to operate a general iron works. It has acquired a plant and will do its own work temporarily. The incorporators are E. F. Minden and P. F. Edgar. The company is represented by J. G. Snyder, 256 Broadway, New York.

The Niagara Welding & Boiler Works, Inc., 1140 Whitney Avenue, Niagara Falls, N. Y., was recently incorporated to manufacture boilers and other iron products. It has taken over the business of the Niagara Welding Works and will continue boiler making and welding. It does not intend to manufacture at present. The incorporators are W. I. Grantham, J. Karon and H. J. Cantara, all of Niagara Falls.

The Consolidated Foreign Motor Car Co., 135 West Seventy-second Street, New York, has been incorporated under the Delaware laws with a capital of $22,500,000 to manufacture automobiles. At present it plans to equip chassis of foreign manufacture with coachwork built in the United States. Agencies will be established in all the principal cities.

The Detroit Automatic Vending Machine Co., Detroit, is ready for operations, manufacturing automatic food vending and liquid dispensing machines for use in restaurants.

The Gerson Rolling Mill Co. has been incorporated under the name Southern Steel & Rolling Mill, Inc., Birmingham, Ala., with a capital of $200,000. At present it is installing a 16-in. bar mill, to be equipped with two four-door sand bottom furnaces. The company's 8-in. mill will be changed to electric power, increasing the yearly capacity to 30,000 tons. It will specialize in reinforcing bars and fence posts in addition to the merchant bar trade.

The Medina Lake Boat Works, Medina Lake, Tex., recently organized, is in the market for boat equipment of all sorts. Its business is building and repairing boats.

The Perfection Ice Scoring Machine Co., Gainesville, Tex., manufacturer of ice scoring machines, will have some of its manufacturing done by contract in the North at a later date. At present these machines are being made in three plants in Waco, Tex. The officers are: R. H. Roark, president, and W. McKemie, vice-president and general manager.

The Huron Mfg. Co., Detroit, which was recently incorporated, has made tentative arrangements for manufacturing. It is undetermined about its final plans. H. N. Reynolds is president.

The McChesney Foundry & Mfg. Co., 812 Texas Street, El Paso, Tex., was recently incorporated to manufacture iron and steel specialties. It is operating in a plant which was built last November, but plans are under way to increase its capacity. Some of its products are cast-iron grates, tanks and soil pipe, furnaces, boilers and heaters. The company also has a pattern shop. The incorporators are: L. P. McChesney, president, W. S. Dobie and S. J. Isaacs.

The consolidation of the firm Marks & Fiske, distributors of iron and steel supplies, and Louis Zeiger & Co., operators in iron and steel in the Middle West for the past 15 years, is announced. The merged firms are to be incorporated as the Marks-Fiske-Zeiger Co. with offices and warehouse at 2503-07 Twenty-fourth Street, Detroit. Plans for expansion of warehouse and yard facilities have been put into operation. A complete stock of steel will be handled. A separate department will be devoted to the handling of rails and railroad equipment. Harry J. Marks is president of the new concern; Louis Fiske, vice-president, and Louis Zeiger, treasurer and chairman of the board.

The Lees-Bradner Co., manufacturer of gear generators, thread millers and gear tooth grinders, Cleveland, has established a direct sales office at 32 North Clinton Street, Chicago, in charge of Frank E. Artz.

Trade Changes

The Charcoal Iron Co. of America announces the removal of its general offices from Detroit to Union National Bank Building, Marquette, Mich.

The Illinois Tool Works, manufacturer of cutters, hobs and reamers, Chicago, has appointed the Commercial Steel & Supply Co., Plymouth Building, Cleveland, as its representative in the Cleveland district. Complete facilities are available to the Commercial Steel & Supply Co. for rendering service to customers.

W. A. Jones Foundry & Machine Co., manufacturer of speed reducers and power transmitting machinery, with general offices and factory at 4401-4451 West Roosevelt Road, Chicago, announces the opening of another branch sales and engineering office at 2482 University Avenue, St. Paul, Minn. C. F. Ford, who is in charge of the new branch, is a transmission engineer, experienced in working out elevating, conveying and power transmitting problems.

The Morse Chain Co., Ithaca, N. Y., has changed the location of its Philadelphia offices to 612 Franklin Trust Building and 18-22 South Fifteenth Street.

The Wagner Electric Mfg. Co., St. Louis, has changed its name to the Wagner Electric Corporation.

The Erie Mop & Wringer Co., Erie, Pa., has changed its address to East Rochester, N. Y.

The Republic Pipe & Iron Corporation, 1185 Flushing Avenue, Brooklyn, N. Y., has changed its address to 23-29 Varick Avenue, Brooklyn.

The C. C. Carter Machinery Co. has changed its address from 36 Garnet Street to 150 Chestnut Street, Providence, R. I. Its new warehouse, which trebles the storage space in the old location, is at 37-39 Bassett Street.

Samuel W. Hay's Sons, 1410 Keenan Building, Pittsburgh, has been appointed representative of the Diamant Tool & Mfg. Co., Inc., 91 Runyon Street, Newark, N. J., for the sale of standard punch and die sets in a part of Pennsylvania.

The Mechanical Appliance Co., Milwaukee, has changed its name to the Louis Allis Co. There is no change in ownership or personnel.

The American Electric Fusion Corporation has changed its address from 1906 North Halsted Street, to 972 Montana Street, Chicago.

Scheid Engineering Corporation, 90 West Street, New York, has been appointed metropolitan and export representative for the Franklin Moor eCo., Winsted, Conn., manufacturer of material handling machinery for industrial plants.

Charles Eisler, mechanical engineer, has moved his factory and offices from 15 Kirk Alley to 736 South Thirteenth Street, Newark, N. J., where he has a new brick factory of 6000 sq. ft. capacity.

The Montgomery Chemical Works, Inc., Elmtree and Doremus Streets, Detroit, has changed its address to Buffalo and Doremus Streets.

The Milwaukee Machinery Co., Milwaukee, will move from its present location, Sycamore Building, to its new offices and display room at 93 West Water Street, on Sept. 1.

The American Pipe & Supply Co., 1420 South Eighth Street, Philadelphia, has leased the entire building at 305 Cherry Street, for a new plant.

The Sayre-Level Radio Co., 905 Filbert Street, Philadelphia, manufacturer of wireless equipment, has tentative plans for a factory. New equipment will be installed.

The Nashua Gummed & Coated Paper Co., announce that the transfer of business of the National Binding Machine Co. is completed, forming a new division of the former company known as the Package Sealing Division, located at 291 Broadway, New York.

H. T. Henning & Co., Shubert Building, 250 South Broad Street will remove its offices to 724-725 Land Title Building, Broad and Chestnut streets, Philadelphia on August 31.

Frazer & Co., 30 Chuch Street, New York, announce the opening of an office in Zurich, Switzerland.

Phillip A. Udall, for several years with the Holt Mfg. Co., Peoria, Ill., in the capacity of mechanical engineer, and engineer in charge of the Panama Exhibit under George W. Goethals, has formed a company with J. A. Landon, Inc., the new firm to be known as the Udall & Landon Mfg. Co., 205 Lafayette Street, New York. It has acquired the properties of the former company and is developing two new patents which it will put on the market in the near future.

The O. & J. Machine Co., Worcester, Mass., has moved from 116 Gold Street to quarters one-third larger at 60 Ellsworth Street. In addition to Oslund continuous wire-drawing machines, described in these columns last February, the company continues the manufacture of automatic corking, crowning and labeling machines for all purposes and has added a new line in automatic testing tanks for testing bottles.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossbile to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

Bars:	
Refined iron bars, base price	2.94c.
Swedish bars, base price	7.00c.
Soft steel bars, base price	2.94c.
Hoops, base price	4.29c.
Bands, base price	3.74c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	3.04c.
Channels, angles and tees under 3 in. x ¼ in., base	2.94c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	2.94c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.14c.
Toe-calk, ½ x ⅜ in. and larger	4.00c.
Cold-rolled strip, soft and quarter hard	6.75c. to 7.25c.
Open-hearth spring steel	4.50c. to 6.00c.
Shafting and Screw Stock:	
Rounds	3.90c.
Squares, flats and hex	4.40c.
Standard cast steel, base price	12.00c.
Extra cast steel	17.00c.
Special cast steel	22.00c.

Tank Plates—Steel

¼ in. and heavier	3.04c.

Sheets

Blue Annealed

	Per Lb.
No. 10	4.04c. to 4.19c.
No. 12	4.09c. to 4.24c.
No. 14	4.14c. to 4.29c.
No. 16	4.24c. to 4.39c.

Box Annealed—Black

	Soft Steel C. R., One Pass, Per Lb.	Blued Stove Pipe Sheet, Per Lb.
Nos. 18 to 20	4.55c. to 4.70c.	.....
Nos. 22 and 24	4.60c. to 4.75c.	4.60c.
No. 26	4.65c. to 4.80c.	4.65c.
No. 28	4.75c. to 4.90c.	4.75c.
No. 30	5.00c. to 5.15c.	.....

No. 28 and lighter, 36 in. wide, 10c. higher

Galvanized

	Per Lb.
No. 14	4.85c. to 5.00c.
No. 16	5.00c. to 5.15c.
Nos. 18 and 20	5.15c. to 5.30c.
Nos. 22 and 24	5.30c. to 5.45c.
No. 26	5.45c. to 5.60c.
No. 27	5.60c. to 5.75c.
No. 28	5.75c. to 5.90c.
No. 30	6.25c. to 6.40c.

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.
⅛ in. Butt	—53	—38
¼ in. Butt	—58	—45
1-8 in. Butt	—60	—47
2½-6 in. Lap	—57	—44
7-8 in. Lap	—53	—30
9-12 in. Lap	—49	—30

Wrought Iron	Black	Galv.
¾ in. Butt	—23	—5
1½ in. Butt	—25	—7
2 in. Lap	—19	—3
2½-6 in. Lap	—23	—7
7-12 in. Lap	—15	+1

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	3.50c. to 3.75c.
Annealed soft	3.50c. to 3.75c.
Galvanized annealed	4.25c. to 4.50c.
Coppered basic	4.00c. to 4.25c.
Tinned soft Bessemer	5.50c. to 5.75c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	19¼c. to 20¼c.
High brass wire	20¼c. to 20¾c.
Brass rod	16¾c. to 17¾c.
Brass tube, brazed	26¼c. to 27¼c.
Brass tube, seamless	23 c. to 23½c.
Copper tube, seamless	25¾c. to 26 c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 22¾c. to 23¾c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20
IC	$10.00	$8.50
IX	11.50	10.00
IXX	13.00	11.25
IXXX	14.25	12.50
IXXXX	16.00	14.00

Coke—14-20	Primes	Wasters
80 lb.	$6.05	$5.80
90 lb.	6.15	5.90
100 lb.	6.25	6.00
IC	6.40	6.15
IX	7.40	7.15
IXX	8.40	8.15
IXXX	9.40	9.15
IXXXX	10.40	10.15

Terne Plates

8-lb. coating, 14 x 20

100 lb.	$7.00
IC	7.25
IX	7.50
Fire door stock	9.00

Tin

Straits, pig	36c.
Bar	43c. to 47c.

Copper

Lake ingot	15¼c.
Electrolytic	15 c.
Casting	14¾c.

Spelter and Sheet Zinc

Western spelter	8 c. to 8½c.
Sheet zinc, No. 9 base, casks	9c. open 9½c.

Lead and Solder*

American pig lead	6¾c. to 7c.
Bar lead	8c. to 8½c.
Solder, ½ and ½ guaranteed	25c.
No. 1 solder	23½c.
Refined solder	20¼c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	75c.
Commercial grade, per lb	35c.
Grade D, per lb	25c.

Antimony

Asiatic	6½c. to 7c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb	25c. to 27c.

Old Metals

Business is quiet but the market is a little firmer this week. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	11.75
Copper, heavy wire	11.25
Copper, light and bottoms	9.25
Brass, heavy	6.25
Brass, light	5.25
Heavy machine composition	8.50
No. 1 yellow brass turnings	6.50
No. 1 red brass or composition turnings	8.00
Lead, heavy	4.50
Lead, tea	3.50
Zinc	3.25

THE IRON AGE

New York, September 14, 1922

ESTABLISHED 1855

VOL. 110, No. 11

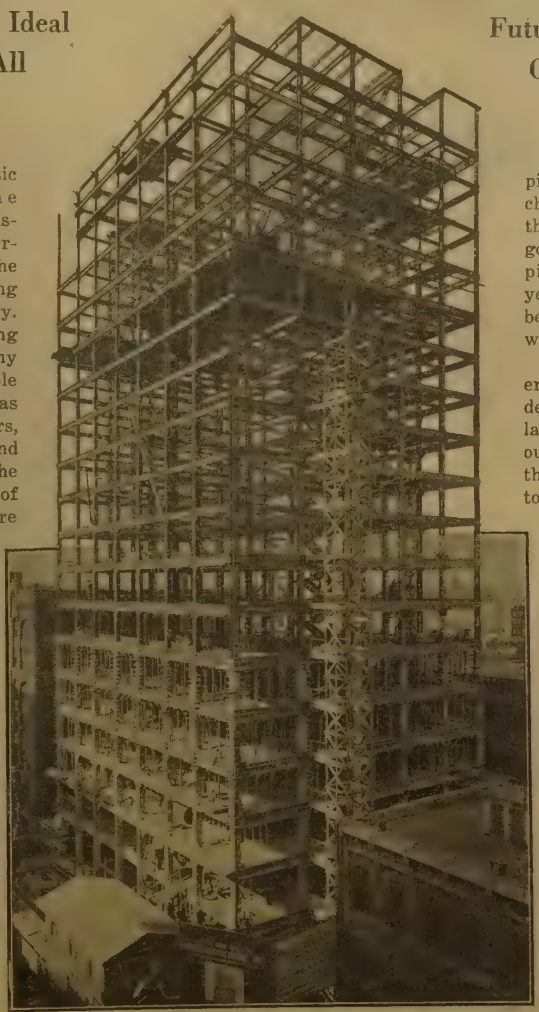
Steel Lumber Developed for Buildings*

New Light Sections Ideal for Dwellings and All Other Easy Loads

Future Assured by Its Own Qualities and a Dearth of Timber

AS a producer of basic raw materials, the iron and steel industry must have a keen interest in the expansion of the building industry now taking place throughout the country. The outlet which the building industry has been for many years, for a fairly sizable tonnage of such items as sheets, shapes and bars, henceforth must widen and grow in importance. The reasons for this advance of steel in construction are fundamental. It is the old story of the abundance and superior quality of steel against a growing shortage and inferior quality of wood.

Statistics on timber land, usually given in terms of millions of acres, and sawed lumber, given in terms of billions of board feet, afford the casual person little hint of this shortage, but the persistently increasing prices of marketable wood should be notice to everyone that the supply is gradually falling below demand. In an exhaustive treatise on timber depletion, lumber prices, etc., published by the Forestry Bureau of the Department of Agriculture in June, 1920, the clear cut statement is made that 4419 saw mills, representing 82 per cent of all the saw mills operating on virgin Southern pine, will have "cut out" in five years. The further unqualified statement is made that by 1930 the South will produce less pine than the Southern or home market will demand. Long leaf and short leaf yellow pine of the South, now the chief structural lumber of the East and Middle West, is going the way of the white pine of the North. In a few years only enough of it will be left for use as a specialty wood.



American Exchange National Bank, Dallas, Texas, 21 Stories High, in Which the Floor and Other Loads Between Main Structural Girders Are Carried by Light Steel Lumber Joists

As the depletion of Southern pine increases, greater demand will be made on the last great timber stand of our country, the fir trees of the Pacific Slope. Even there, to quote the Department of Agriculture, "are already local evidences of depletion, warnings that the conclusion of our store of soft woods will be the same as that of other regions and in far less time than has generally been estimated."

Steel must take the place of wood for all structural purposes in building construction, for the simple reason that no other material suitable for the same purpose will be available. Specifically, this means that steel joists and steel studs, steel columns and steel beams must provide the frames or skeletons of buildings.

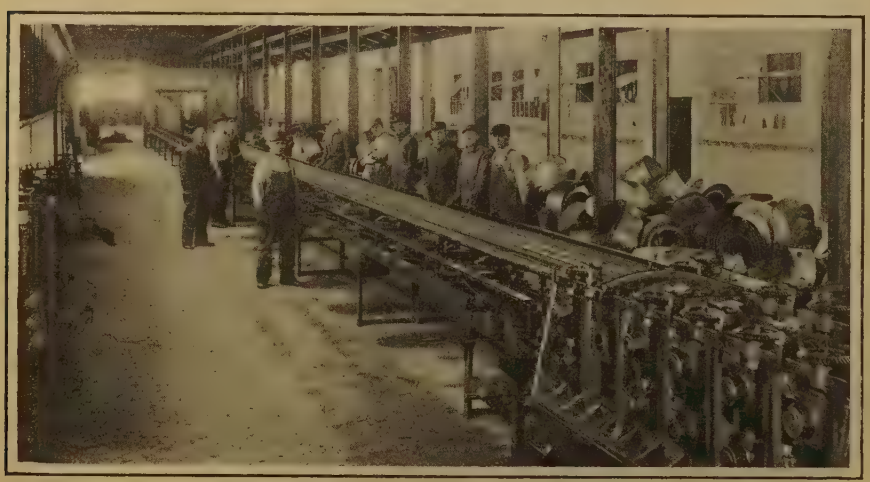
In considering this new outlet for steel tonnage, some new steel materials are coming into prominence. Chief of these are the light-weight structural sections known as steel lumber and expanded steel lath. Both of these products have made tremendous strides in the last few years. Steel lumber has developed to a mill production basis, with distribution through structural steel fabricators, in precisely the way heavy rolled structural shapes were developed. Steel lath has likewise secured public recognition and its use has devel-

*By Gilbert Canterbury, 619 Twelfth Street, N.W., Canton, Ohio.

oped to a point where a goodly tonnage of sheets is now consumed annually in the making of this product. Materials are now available to make two tons of steel grow in the building industry where one grew before.

Another factor helping to bring about a general change to steel in the building industry is the increasing public consciousness of the importance of more fire-safe construction of buildings. As wood lumber has grown more scarce and more expensive, builders have harkened more and more to the teachings against combustible construction that have been flooding the country in gradually increasing volume during the last twenty years. Ever-mounting fire losses, now flourishing at the rate of $365,000,000 annually, are becoming recognized as a great economic waste, and the fact that an average of 15,000 human lives are also lost in fires annually has helped to establish that public recognition.

Still another factor in the progress of construction, appealing to the steel industry, is the unquestioned need for greater permanency in buildings, aside from the hazards of fire. Wood is a porous, moisture-absorbing material which, generally speaking, has but a short life of usefulness under normal conditions. It rots and warps and shrinks and the yearly depreciation and annual bill for necessary repairs on a wooden building are notoriously large. The difficulty of maintaining our modern ideas of sanitation in wooden buildings produces another tendency toward the general adoption of some other building material.



Forming Light Steel Structural Sections from Hot Rolled Strip Steel Coils. The forming is done cold on the machine shown in right foreground, by means of the rolls, governed by the screws at the top

Slow Development

Though some few elements of the steel industry have been aware of these changing conditions for a long time, steel makers as a whole have not given the attention to the building question that such a potentially large outlet for tonnage deserves. Fifty years ago, cast iron and wrought iron constituted the industry's sole contribution to the business of construction.

Not so many years ago engineers were still experimenting with vastly different materials, in vain efforts to expand the usefulness of those materials beyond their physical limitations. Buildings with solid brick bearing walls were attempted to heights beyond the crushing point of bricks. The Monadnock Building, in Chicago, was achieved in one of these experiments by methods which to-day would be utterly prohibitive in cost. The building still stands as an engineering marvel. The Pulitzer or World Building, in New York, has foundation walls 13 ft. thick.

Hot rolled structural steel sections were at length developed. With these, steel frames or skeletons of buildings were erected so that masonry walls were supported by the steel, and each story was a separate unit so far as the masonry was concerned. The 10-story Tower Building, in lower Broadway, recently razed to make way for a larger structure, was the first steel frame building of modern type, but the famous Flatiron Building, in New York, was the first outstanding achievement with this steel material. Since then, with it has been developed America's chief contribution to the world's architecture, the American skyscraper.

Fifteen years ago an entirely new structural steel section was perfected and placed at the disposal of the building industry. This new product, furnished in I-sections and channels, weighed only one-third as much as standard rolled structural steel I-beams and channels. These new sections were made from sheet steel originally. The channels were made by slitting and forming the sheets and the I-sections were made by placing two channels back to back and riveting them. This section formed the nucleus of what is now popularly known as the steel lumber industry.

Steel lumber, as its popular name applies, was originally designed to take the place of wood joists and studs in building construction. Through the associate use of expanded metal lath, which serves as a base for concrete or plaster, steel lumber has developed into structural material for thoroughly fireproof floor and wall construction. In the mill production of this product, slabs 6 to 8 in. wide, 3½ in. thick and weighing from 300 to 750 lb., constitute the raw material. Specially designed strip mills roll down these slabs gradually to strips of light gage, 130 ft. long and ranging in widths up to approximately 17 in.

These strips are finished hot and coiled. The coils, when cold, are fed into cold-forming mills which produce the steel lumber channel sections. The steel lumber I-sections are produced by placing two channels back to back and feeding through automatic electric spot welders. Ends are trimmed with high speed friction saws and the shop coat of paint is applied immediately after forming by dipping the sections into paint vats. The steel for these operations, up to the point of painting, is handled on a series of roll-tables and a remarkably efficient practice on heavy tonnage has been established.

Distribution of the mill-produced steel lumber is through the same companies which fabricate and erect heavy rolled structural steel shapes. The steel lumber sections, shipped from the mill in lengths limited only by transportation facilities, are cut to exact length for use by the distributer-fabricator. In large buildings steel lumber sections pick up the light loads of floors and partitions and accumulate them to a point where they can be more economically carried by heavy steel sections. In small structures, like dwellings, they take the place of wood joists and studs.

What Steel Offers

The steel industry now provides, for building construction, (a) heavy rolled structural shapes capable of carrying all heavy loads and stresses in a building, (b) light, pressed steel sections capable of carrying the lighter loads and (c) expanded steel lath as a base for plaster or cement stucco. With these products, practi-

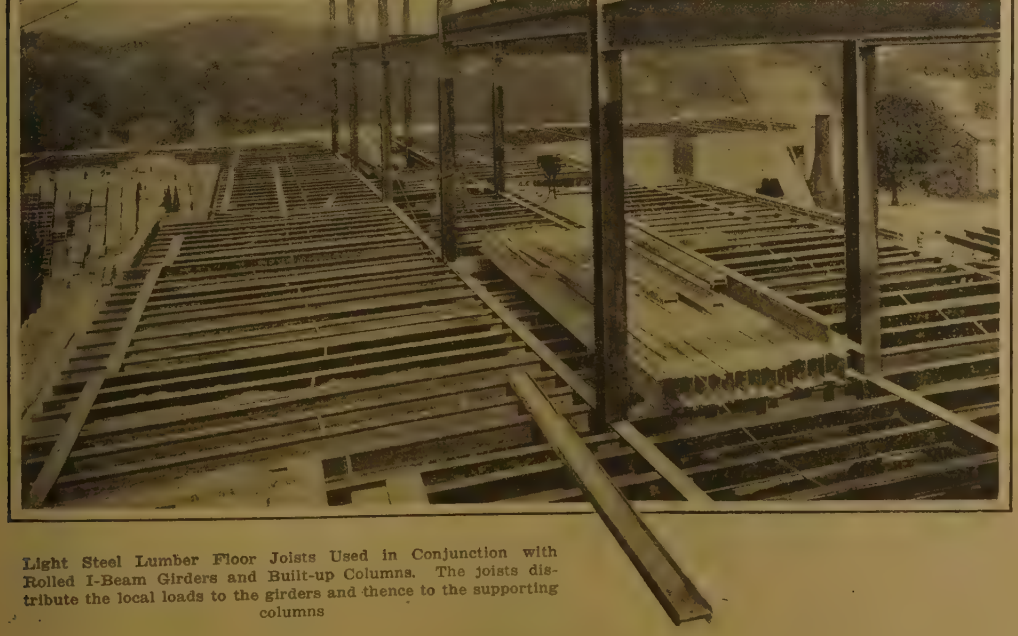
Finishing Train and Run-out Rollers, in the Plant of the Central Steel Co., Massillon, Ohio, Used in the Manufacture of Metal Lumber from Hot Rolled Strip Steel

cally every kind of building can be erected for which there is present-day use.

In addition, the industry provides now, as it has in the past, cast iron columns and other building products, wrought iron for fire escapes, grills, pipe, nails, concrete reinforcing rods and a host of sheet steel products such as corrugated sheets, ventilators, door and window frames, base board, stamped roofing, stamped ceiling, etc. At the dawn of the era of building with steel, the steel industry finds itself well equipped to discharge its responsibilities in the direction of building construction with the same efficiency with which it took over the construction of ships, railroad cars, wagons and automobiles and the thousand and one other industries in which the use of wood has become obsolete.

The light structural steel or steel lumber sections and metal lath are leading the van of this fine array of steel materials in the advancement of sales methods. And much of this work is necessary, if our steel material manufacturing facilities are to be built up sufficiently to take care of the inevitable demand. Sales effort must carry the industry over the period of transition from wood to steel. As an industry, steel has not been a good salesman; and nowhere has poor salesmanship been so apparent as in the handling of steel for the building industry.

Many fallacies exist in regard to such points as the resistance of steel to fire, to corrosion and other destructive agencies. It was upon this foundation of a general misunderstanding of steel that concrete stepped into a prominent position in the building industry. Used first in sidewalks, foundations and similar work, concrete came finally to function as structural building material, displacing steel sections designed specifically for that purpose. This practice afforded outlet to the steel industry only for reinforcing bars, and greatly reduced total steel tonnage. Concrete columns and beams came into use and through the adroit use of a little steel in the way of bars, and the height of concrete structures was run up over 200 ft. The early incomplete line of steel building materials, and the consequent dependence of the industry upon foreign accessory materials, aided this advance of concrete. For instance, a structural steel frame of a large building used masonry



Light Steel Lumber Floor Joists Used in Conjunction with Rolled I-Beam Girders and Built-up Columns. The joists distribute the local loads to the girders and thence to the supporting columns

walls and depended upon concrete, hollow tile or some similar material to carry the lighter loads of floors and roof.

Light steel lumber sections now remedy this condition. Buildings are being erected with heavy rolled steel frames and floors and roof supported on steel lumber I-sections. Expanded steel lath spreads across these steel floor joists and acts as centering and reinforcement for a thin slab of concrete. Thus steel has come back to its original function of serving as structural material, and concrete is used only in sufficient quantities to provide additional fire resistance. Remarkable economies are being achieved in this practice. Besides enormously decreasing the dead weight of buildings, great savings are made in labor. No dead work applies to steel construction, while in concrete construction falsework must be built up to form and support the concrete until it hardens.

But the larger sized fireproof buildings represent only a portion of the outlet for steel to the building industry since the advent of light steel lumber sections and expanded steel lath. Steel joists and steel lath now find a market in small commercial buildings, where the heavy rolled structural steel a few years ago had no market whatsoever. Steel joists and steel lath are used in floor and roof construction in strictly masonry bearing wall buildings of two and three stories in height. In buildings of this character the steel joist tonnage alone averages approximately 200 tons per 100,000 sq. ft. of floor surface. In the larger buildings, where floor joist spans are usually greater, the steel joist tonnage will run from 275 to 300 tons per 100,000 sq. ft. of floor surface.

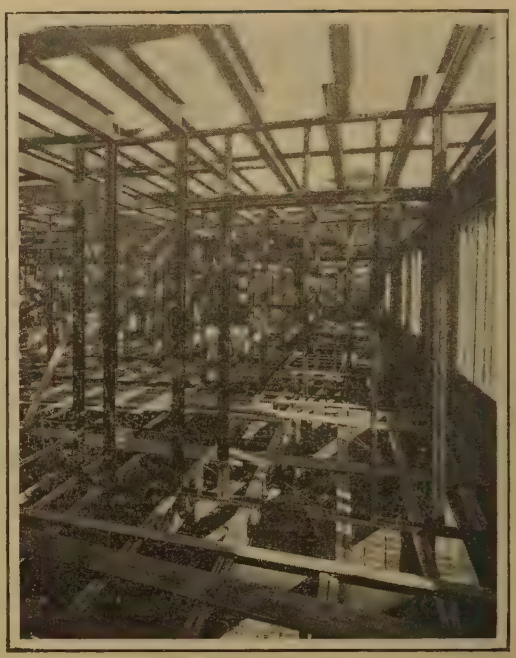
The steel lath required for such construction is double the amount of floor surface to be built, since the lath is used as centering and reinforcement for the concrete slab on top of the joists and is also attached to the bottom flanges of the joists as a base for ceiling plaster. A certain amount of heavy rolled steel shapes are required even for these small commercial buildings as lintels, and as supporting beams to break joist spans, and some cast iron posts are likewise frequently used.

The general utility of the steel lumber floor joists and steel lath are causing them to find market, also, in construction of public schools, hotels, theaters, apartments, garages and practically every type of occupancy where the live floor loads are not excessive and where, a few years ago, steel found no appreciable outlet.

In cities, all buildings of these types in certain zones are required to be constructed fire-safe and some buildings, like schools, theaters, etc., are often required by State laws to be built fire-safe, regardless of location. Thus the use of combustible or wood materials gradually falls off through enforcement of safety measures, leaving reinforced concrete as the only competitor of steel in strictly structural materials.

Steel joists and expanded sheet steel lath are opening a market, also, among the builders of dwellings, even to the inclusion of the small, single-family bungalow. This field represents the absolute base of the building construction industry. It has well been said that no producer of building materials has really invaded the building industry until he has provided something for use in dwellings. Normally, dwelling construction outstrips all other types of buildings and represents about 30 per cent of the entire activity of the building industry. During the first eight months of 1922 the Dodge reports show that 37½ per cent of all awards has been for residential property. The bare statement, made so many times during the last year, of a United States shortage of 1,500,000 homes, gives sound reason for the conjecture that residence construction will continue for many years to consume a large portion of the materials going into the building industry.

Steel Lumber Joists Set into Forms, with the Ends to Be Embedded in Reinforced Concrete T-Beams, in the Y. M. C. A. Building at Hagerstown, Md.



Light Steel Joists and Light Pressed Steel Sections for Bearing Partitions, with Rolled Structural Steel Main Framing

It is the function of steel to reduce and eventually eliminate the hazard of fire in dwellings and its medium for this purpose is the light structural section of steel joists and steel studs. The preliminary effort of steel in this direction should be in furthering the practice of building fire-safe first floors. The logic for this practice is found in the fact that the major fire hazards of the home are located in the basement. A large majority of dwelling fires originate either in the basement or in the first floor. Here are located such well known fire hazards as furnaces, hot-water heaters, horizontal heating pipes, coal, ash bins and frequently open-flame laundry stoves, gas jets, etc., as well as cooking and other stoves, open grates, etc.

A high measure of fire protection may be secured if a steel joist fire-safe first floor is spread across the foundation walls. In this construction metal lath may be attached to the underside of the steel joists and plastered, after which the regular double wood floor surface can be laid on the tops of the joists. Nails can be driven right into the webs of the joists. Another practice is to leave the joists exposed or open in the basement and to lay metal lath on the top sides of the joists, and cover with a 2-in. concrete slab, embedding wood screeds to which the wood floor surface may be nailed. The cost of this steel joist first floor construction closely parallels the cost of combustible and dangerous wood joist floor construction.

The first principle of fire-safe and more permanent construction is the elimination of cumbustible and rap-

idly deteriorating materials. It follows, then, that added advantages are secured through the use of steel joist second floors and roofs, steel stud partitions and steel framed or solid masonry walls. The first installation of steel lumber joists and studs was a duplex dwelling, built fifteen years ago at Tuxedo Park, N. Y., and originally designed for wood lumber structural members. H. M. Naugle, who had conceived the idea of the light steel structural sections, re-designed the building, replacing every stick of wood shown on the plans with the steel lumber sections.

This 16-room building was erected by the Taft-Howell Co., Cornwall-on-the-Hudson. About 18 tons of steel lumber were used. The building was started in May and finished in October. The cost at that time was $5,700. Some miscalculations were made by the contractors in their estimate of this very first steel frame dwelling ever erected, but the same contractors agreed to duplicate the house at that time for $6,300. As early as 1912 the United States Government, recognizing the economy and advantages of steel lumber construction, purchased 44 carloads of steel lumber and shipped it to Honolulu, where it was used in the erection of 33 16-room and eleven 14-room structures at the army barracks there. In these buildings the steel lumber took the place of all structural wood material.

The general size of the great building industry to which these various steel products appeal has never been accurately estimated. No systematic record is kept of total building construction in cities, and no record at all is kept of total building work on the farms. The "Statistical Abstract of United States" gives data on building permits issued in 69 cities, with an aggregate population of 26,000,000, for the year 1920; the number of permits is set forth as 249,368 and the total valuation $1,115,151,000. The Dodge reports show building contracts awarded in 1919 to a valuation of $2,077,000,000, in 1920 to a valuation of $1,996,894,000, in 1921 to a value of $2,356,000,000 and in eight months of 1922 to $2,362,872,000. These reports cover only 27 States and only towns of over 3000 population in those States. It appears safe to estimate that our annual building construction amounts to something well over two billions of dollars annually. In King's "Wealth and Income of the People of the United States," the total income of the people of the country is set at 18 billions of dollars in 1900 and 31½ billions of dollars in 1910. Estimates for 1920 have run as high as 55 billions of dollars.

But the question of the relative importance of the building industry in the general commercial activity of the nation is of slight importance. Certainly it is vast and assuredly it now presents for the steel industry, with its fine line of steel materials, an enormous outlet for tonnage.

So far the record of steel in building construction is practically flawless. It is popularly known to possess an enviable line of virtues, the chief of which lies in the fact that steel is a definitely known and uniform quantity. There is little or no guess work about building with steel. Factors of safety in all the steel products are large and definite. The performance, particularly, of the heavy rolled shapes and the steel lumber sections has set the building industry's standard for long life, economy and general reliability.

Casting Aluminum Bronze for French Coinage*

The French Government has decided to replace the paper money notes at present in circulation with small, golden-like coins of aluminum bronze.

In 1909 the French Ministry of France set up a Commission to propose a likely metal to replace the old coins then in existence. This commission asked an engineer who specialized in the question of alloys, P. H. Gaston Durville, to prepare bronzes of aluminum which should approach as near as possible to the metal of Sainte-Claire Deville, who experimented half a century ago, calling it French metal.

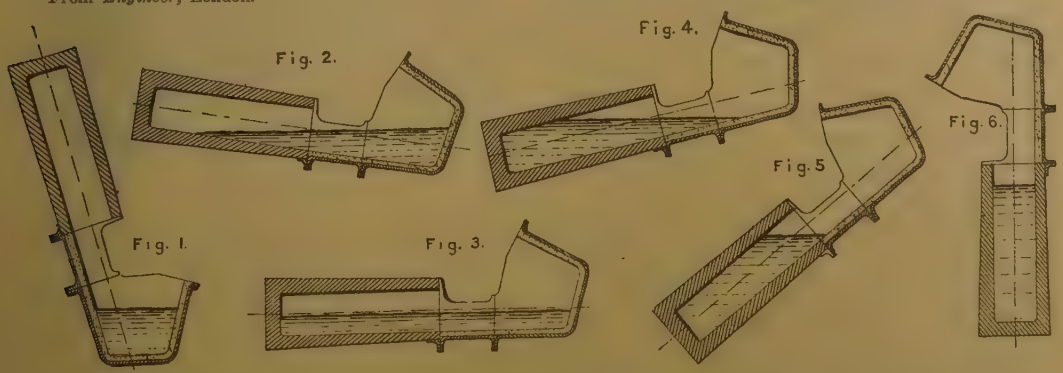
M. Durville is now preparing homogeneous ingots possessing a greenish-gold color, which can be polished as well as the hardest steels. One of the chief difficulties to be faced was the inclusion of slags, air bubbles and other oxidized bodies when pouring the ingots. To overcome this, M. Durville invented and patented, in 1913, the apparatus illustrated. It is composed of an ingot mold and a pocket or ladle rigidly connected with each other by a communicating canal. These three elements are kept in a straight line, once they are brought together. The ladle and the canal are lined with a refractory material.

At the factory at Mouy-Bury, where the Alloy and Forgeable Bronze Company employs the Durville method, the alloy is melted in a crucible, its free surface oxidizes and becomes covered with a film of alumina, which protects the parts of the bath below it from further oxidation. Once the alloy is melted, the pouring must be effected without the slightest agitation.

From the crucible the alloy is poured into the ladle, which is then rapidly attached to the ingot mold. The whole apparatus is then tilted, as shown successively in Figs. 1 to 6, and the molten mass flows gently from the ladle into the four compartments into which the ingot mold is divided. As will be seen, the surface of the liquid bronze is kept horizontal throughout the operation. The alloy occupies successive positions without the least jerk, until it arrives in the ingot mold, where it solidifies. Its passage from one to the other is accomplished gently and evenly, in spite of the rapidity of the flow. As soon as solidification has taken place the ingots are withdrawn.

The aluminum bronze leaves the factory in the form of rectangular plates, each one weighing 60 to 70 kilos (130 to 150 lb.), which are then reduced to strips from which the coin blanks are stamped.

*From *Engineer*, London.



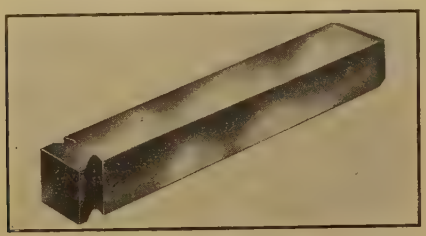
Six Successive Positions in Transferring the Molten Metal from the Ladle into the Ingot Mold. The two are joined by an intermediate section which acts as a runner

Self-Fitting and Cutting Keys

Self-fitting keys known under the trade name of Keytite, which by being driven into the keyway cut their own seats, and intended to save hand fitting as in the case of the usual square keys, are being offered by Smith & Serrell, Central Avenue, Newark, N. J.

One of the keys is shown in the accompanying illustration. A tough chisel stock is used and ground to a size slightly larger than the nominal keyway width. A cutting edge and chip recess are provided near the front end of the key, and ahead of these there is a pilot which is slightly smaller than the nominal keyway width. To install the key, the pilot is entered first with the cutting edge at the side, the key then being driven home with a hammer or a sledge, depending upon the size of the key.

The cutting edge cuts the keyway to fit the key body, the job being done, it is said, in a fraction of the



The Cutting Edges Cut the Keyway to Fit the Key Body. Chip recess and pilot are shown at left end of key

time necessary to hand fit a key. The cut fit is tight, yet not too tight to burst a hub. Oversized keys refit old keyways quickly and thus may serve to keep important machines in operation.

In the larger sizes cutting edges may be provided on both sides and when it is desired to fit top and bottom as well as on the sides, a cutting edge is also provided at the top. Gib keys and other modifications, incorporating the self-fitting feature, can be furnished as required. Keys with heads are available for places where headless keys cannot be drifted out, and many of the larger sizes can be provided with a hole tapped in the end permitting the key to be pulled out by a bolt. Taper keys, with or without heads, are available, although top and side self-fitting keys are recommended on heavy duty work where it is desired that the key fit top and bottom as well as sideways.

August Construction Ahead of Last Year

Building contracts awarded in the 27 Northeastern States during August amounted to $322,007,000, according to the F. W. Dodge Co. This figure was 46 per cent over that of August, 1921, and only 8 per cent under that of July, 1922. A seasonal decline set in after four months of unprecedented activity and the decline is slight.

The August figures brought the total for the year to date up to $2,362,872,000, which is not only the largest figure for the first eight months of any year, but is greater by $7,000,000 than the total for the entire year 1921. Comparing this year with 1921 on the eight months' basis, the year is 58 per cent ahead.

The outstanding feature of the August statistical statement is the increase in industrial plant construction, which amounted to $67,373,000, or 21 per cent of the month's total. This is the largest monthly figure for this class since March, 1920. One project accounted for $35,000,000 of this large total, the by-product coke plant of the Carnegie Steel Co. near Pittsburgh. Even omitting this large single project, the remaining amount is greater than any monthly total since November, 1920.

Residential building still maintains the lead in August, with $100,882,000 worth of contracts, or 31 per cent of the total. Residences for the eight months amounted to $887,250,000, or 37½ per cent of the total, against 40 per cent for the first six months of the year, a slackening in this item having occurred since July 1. Public works and utilities in August amounted to $49,825,000, or 15 per cent; business buildings, $38,122,000, or 12 per cent; and educational buildings, $32,055,000, or 10 per cent.

Contemplated new work reported during the month amounted to $371,249,000.

Business Conditions Still Sound

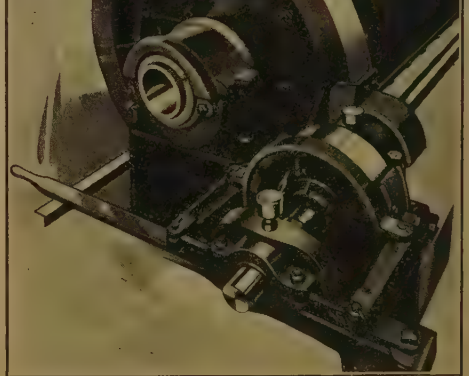
In reviewing the state of industry, the advance sheets of the Department of Commerce for the month of July lay stress upon the comparison with July of last year rather than with June, 1922. The belief is expressed that the very serious labor difficulties through which we are now passing would under many conditions have completely demoralized business. Instead of this, however, real progress has been made in many lines. Thus, the shipment of iron ore through the "Soo Canal" in July was 35 per cent greater than in June and was more than double the figure for July, 1921. The output of crude petroleum, more than 46,500,000 barrels, was 2 per cent greater than in June and, with the exception of last March, shows the greatest total in our history. Consumption of petroleum, exceeding 51,000,000 barrels, is the highest for any month on record.

Production of sheets—blue, black and galvanized—fell off from 86.4 per cent of capacity in June to 72.7 per cent in July. Both may be compared with 19.7 per cent in July, 1921. Shipment of steel barrels dropped from 267,000 in June to 221,000 in July, against 96,750 in July, 1921. Building costs increased in July to 173 per cent of the pre-war figure, against 170 per cent in June. These compare with 204 per cent in July, 1921. The total stock of money in the United States, held outside the Treasury and the Federal Reserve system, decreased from $4,376,000,000 in June to $4,337,000,000 in July, the figure in July, 1921, having been $4,866,000,000. The latest figure represents $39.47 per head of population.

Clutch and Brake for Tumbling Mills

A combination clutch and brake mechanism for tumbling mills arranged as shown in the accompanying illustration, and intended to contribute to the safe operation of the mills, has been placed on the market by the Whiting Corporation, Harvey, Ill.

With this mechanism a loaded mill can be brought to rest at the proper point for unloading, and without



Combination Clutch and Brake for Tumbling Mills. Control is by the hand lever shown

loss of time. Holding the mill in place by a wood prop or a bolt thrust into the gearing, as commonly done, is always dangerous. With the combination clutch and brake it is impossible for the barrel to turn after the brake is set, even though the barrel is unequally loaded.

It is designed as a simple and fool-proof device and is controlled by a hand lever, the shifting of which toward the mill engages the clutch and starts the mill. To stop the mill, the lever is moved in reverse direction, passing through neutral to the braking position.

NEW THREAD SNAP GAGE

Gages by Sight and Touch—Interchangeable Rotatable Gaging Elements Used—Lasting Accuracy a Feature

A new type of adjustable thread snap gage, intended to afford a proper "feel" of the dimension, and an unobstructed view for "seeing" the elements of a screw thread, singly or collectively, and which may be used either as a working or an inspection gage, has been placed on the market by the Johnson Gage Works, Hartford. By elements of a screw thread is meant size, lead, form, roundness and straightness.

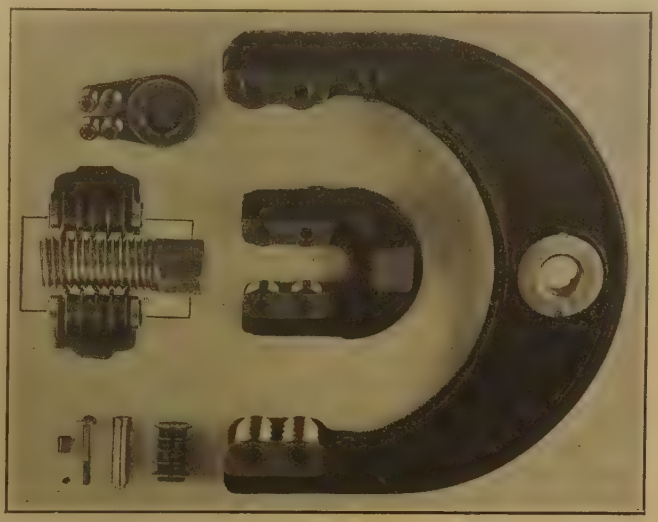
An advantage of the snap gage is that the sense of sight as well as that of feeling may be used in checking up the piece being inspected. The relation between the gaging elements and the piece can be determined because light passes through a very small opening and is shut out entirely where contact has been effected. The principles used in the design and construction of these gages vary, the instrument illustrated being a recent contribution to gages of this type.

Among the claims for the new gage are that its accuracy is permanent and its adjustment simple and positive. It incorporates a "go" and "not go" limit, and gages single, double, left and right-hand threads. The three styles available are shown in the accompanying illustration. In style A, which is for general use except where a lead check of length is necessary or in pitches coarser than 10, the gage elements are approximately ⅝ in. long. In style B the gaging elements are about 1 in. long. Style C is for the A. S. M. E. sizes from No. 0 to No. 12, inclusive.

It may be noted from the illustrations that the gages employ rotatably mounted circular gaging elements, or rolls. The advantage of this principle of construction, as explained by the makers, is that the circular element gives a line contact, affording a proper "feel" of the dimension and an unobstructed view for "seeing" the elements of the screw thread. In rotating, friction and wear is comparatively eliminated, serving to lengthen the life of the gage.

Two sets of gaging rolls are provided, the outer rolls being the "Go" set and the inner the "Not Go" set. The annular ribs of the rolls are the same in form as the thread to be inspected, and these ribs are spaced to project between every second thread. Functioning without relation to the helix angle of the thread, the gage may be used on left and right hand, single or double threads. By using one rib of the gaging element the pitch diameter of the thread can be accurately determined. By using the entire length of the rolls the form of the thread and the lead can be determined at a glance, and also the presence of any taper detected. A staggered thread or one that is out of round can be detected by rotating the piece while it is engaged. Another feature is that the gaging elements are interchangeable and threads of the same diameter but different pitch can be inspected with the same gage. Work cannot be cramped between the gaging rolls.

Adjustment of the rolls is by rotating the eccentric bushings on which they are mounted, the total adjustment being 0.040 in. The gage is set to a soft master or setting plug and after being set the adjustment is locked by a binding screw. A soft plug may be used in the place of a hardened and ground sizer, because, it is claimed, there is no wear in the setting process.



Adjustable Thread Snap Gages. The larger gage is style B and the one within it style A. Style C is shown at upper left. Details at lower left belong to style B. The gage in use is shown in the insert

Number of Employees Decreased

WASHINGTON, Sept. 12.—The unsettled industrial situation is held by the United States Employment Service to be largely responsible for a decrease of 1381 employees in the aggregate number employed during the month ending Aug. 31, as reported by 1428 concerns usually employing more than 500 workers each. The decrease in the iron and steel industry under July was only 270, while for metals and metal products other than iron and steel the decrease was 2048. Other decreases were: Vehicles for land transportation, 3676; food and kindred products, 1895; paper and printing, 636; miscellaneous, 603; lumber and its manufacture, 571; textiles and their products, 292, and liquor and beverages, 18. The greatest increase, 3941, was made by the chemical industry. Other increases were: Leather and its finished products, 2244; stone, clay and glass products, 1205; railroad repair shops, 900; tobacco, 268.

The showing was better than many had expected in view of the rail and fuel situation. The report says that building operations are satisfactorily increasing employment. It is pointed out that some industries are suffering from a labor shortage, this including iron and steel, but that the harvesting season is drawing to a close in Minnesota, North Dakota and Montana, which will cause a surplus of labor. The demand for labor in those States, however, indicates this surplus will be readily absorbed. A strong trend toward increased employment in face of many obstacles, it is declared, signifies a progressve march toward stabilization of industry.

During the first six months of 1922, according to information received by the Department of Commerce, French exports of iron ore reached 4,328,455 metric tons as against 2,666,428 tons during the first six months of 1921. The exports of iron ore from one period to another increased, especially for Germany (1,160,058 tons against 505,702 tons). They remain stationary for Belgium and show an increase for the Saar and the Netherlands.

The Philadelphia Foundrymen's Association resumed its monthly meetings Wednesday evening, Sept. 13, at the Manufacturers' Club, Philadelphia. A part of the program was a memorial service for the late Thomas Devlin, who was president of the association for 15 years.

AUGUST STEEL OUTPUT

Ingot Production Rate About 30,273,900 Tons Per Year—Daily Output 15,360 Tons Less Than in July

According to the steel ingot statistics, as collected by the American Iron and Steel Institute, the 30 companies, which in 1921 made 87.50 per cent of the total, had an output in August of 2,214,582 gross tons. This compares with 2,487,104 tons in July and is a decline of 272,522 tons.

On the assumption that companies reporting are supplying the same percentage of the total as they did last year, the output for the 26 working days of August was about 2,530,900 tons or 97,340 tons per day. The July production on the same basis was about 2,842,400 tons or approximately 113,700 tons per day. The August output was at the rate of about 30,273,900 tons per year; in July it was about 35,360,000 tons and in June about 36,000,000 tons per year.

The statistics of the American Iron and Steel Institute since January, 1921, follow in gross tons:

Months	Open-Hearth	Bessemer	All Other	Total
January, 1921	1,591,281	608,276	3,629	2,203,186
February	1,295,863	450,318	2,796	1,749,477
March	1,175,591	392,983	2,404	1,570,978
April	1,000,053	211,755	2,150	1,213,958
May	1,047,810	216,497	1,543	1,265,850
June	808,286	193,644	1,476	1,003,406
July	689,489	113,312	575	803,376
August	915,334	221,116	1,621	1,138,071
Total—8 months	8,523,707	2,408,401	16,194	10,948,302
September	908,381	265,152	1,207	1,174,740
October	1,269,945	345,337	1,028	1,616,810
November	1,294,371	363,912	1,718	1,660,001
December	1,129,174	296,380	1,539	1,427,093
Total—Whole yr.	13,125,578	3,679,682	21,686	16,826,946
January, 1922	1,260,809	331,851	822	1,593,482
February	1,395,835	348,571	616	1,745,022
March	1,918,570	451,386	795	2,370,751
April	1,997,465	445,939	1,109	2,444,513
May	2,214,774	494,893	1,474	2,711,141
June	2,143,708	487,851	2,918	2,634,477
July	2,020,572	464,047	2,485	2,487,104
August	1,807,310	404,379	2,893	2,214,582
Total—8 months	14,759,043	3,428,917	13,112	18,201,672

The August daily estimated output of 97,340 tons compares with 70,019 tons per day in January and with 114,717 tons per day in May.

Large Increase in Imports of Iron Ore

WASHINGTON, Sept. 12.—Incoming shipments of iron ore for July of this year totaled 166,711 tons and for the seven months period ending with July, 1922, aggregated 374,407 tons. These figures compare with 70,040 tons for July, 1921, and 266,186 tons for the seven-month period ending with July, 1921. The increase in imports is ascribed partly to the lower freight rates that prevailed on import shipments than applied to domestic shipments. Since July, however, the rates have become equalized.

Import figures follow:

Imported from	July, 1922, Gross Tons	Total Value	Seven Months Ending July, 1922, Gross Tons
Spain	4,891	$36,006	20,869
Sweden	54,878	179,032	124,648
Canada	367	1,326	1,321
Cuba	56,275	225,102	133,572
Other countries	50,300	296,250	93,997

Iron and Steel Exports

Figures of the Department of Commerce, supplementing the general statistics covering exports as published on page 602, Sept. 7, show the composition of the shipments to various countries. Thus, of Canada's July purchases, aggregating 48,010 tons, no less than 8630 tons consisted of semi-finished material in the shape of ingots, blooms, billets, sheet bar and skelp. Iron and steel bars and rods, other than wire rods, provided the next largest group, amounting to 6427 tons. Structural shapes, not fabricated, accounted for 5780 tons. There were 3808 tons of iron and steel plates, 3526 tons of black steel sheets, 3101 tons of galvanized sheets, 2369 tons of steel rails and 1899 tons of hoops, bands and strip steel.

Japan, with 37,585 tons, was the second largest customer for American iron and steel. Nearly half of this amount (16,886 tons) was steel rails. There were 8153 tons of black steel sheets, 1339 tons of tin plate and terne plate, 1330 tons of rail fastenings, switches, frogs, etc., 1284 tons of iron and steel bars and rods, 1210 tons of unfabricated structural steel and 2746 tons of scrap.

Steel Corporation's Unfilled Orders

The monthly report of the United States Steel Corporation shows 5,950,105 tons of unfilled business on its books as of Aug. 31, or 173,944 tons more than reported on the books July 31. This increase compares with increases of 140,630 tons in July, 381,303 tons in June, 157,315 tons in May, 602,765 tons in April and 353,079 tons in March, and with decreases of 100,609 tons in February and 26,736 tons in January. The Corporation on Aug. 31, last, had 1,681,691 tons more of unfilled business on its books than it did on Jan. 1, and 1,418,179 tons more than a year ago, and the largest amount for any previous time since March, 1921, when 6,284,765 tons remained unfilled. Following is the unfilled tonnage as reported by months since January, 1920:

	1922	1921	1920
Jan. 31	4,241,678	7,573,164	9,285,441
Feb. 28	4,141,069	6,933,867	9,502,081
Mar. 31	4,494,148	6,284,765	9,892,075
Apr. 30	5,096,913	5,845,224	10,359,747
May 31	5,254,228	5,482,487	10,940,465
June 30	5,635,531	5,117,868	10,978,817
July 31	5,776,161	4,830,324	11,118,468
Aug. 31	5,950,105	4,531,926	10,805,038
Sept. 30	.....	4,560,670	10,374,804
Oct. 31	.....	4,286,829	9,836,852
Nov. 30	.....	4,250,542	9,021,481
Dec. 31	.....	4,268,414	8,148,122

The largest total of unfilled orders was on April 30, 1917, when it was 12,183,083 tons. The lowest was on Dec. 31, 1910, at 2,605,747.

Lake Iron Ore Shipments in August

Shipments of iron ore from the Lake Superior region in August were much larger than those in August, 1921. This year there were 9,016,426 gross tons which compares with 4,329,158 tons in August, 1921. This increase over last year was therefore 4,687,268 tons or 108.27 per cent. The totals by ports, with season shipments and a comparison with 1921, are given below:

	August, 1922	August, 1921	To Sept. 1, 1922	To Sept. 1, 1921
Escanaba	900,975	309,111	2,505,105	758,173
Marquette	465,380	129,691	1,314,145	263,105
Ashland	1,134,577	468,283	3,713,633	1,429,308
Superior	2,338,080	917,693	6,703,043	3,508,928
Duluth	2,896,979	1,833,247	8,023,724	6,472,640
Two Harbors	1,280,435	671,133	4,050,289	2,315,918
Total	9,016,426	4,329,158	26,309,939	14,748,072

The increase in season shipments to Sept. 1, 1922 has been 11,561,867 tons or 78.39 per cent as compared with a decrease for the same period a year ago of 20,601,802 tons or 58.27 per cent.

Of the season's total to Sept. 1, the Great Northern dock contributed 22.90 per cent as against 21.92 per cent a year ago. Duluth is credited this year with 30.49 per cent of this season's total as compared with 43.89 per cent a year ago.

Inland Steel Co. Plans

The Inland Steel Co. has filed two plans for record in the office of the county recorder at Valparaiso, Ind., covering 1200 acres of land east of Gary, Ind. The company has been purchasing land on the shore of Lake Michigan, just east of Gary, for three years, and now owns two miles of lake front. No plans for the development of the property have yet been announced, but with the final consummation of the merger with the Midvale and Republic companies, it is likely that a construction program will be launched. At the Indiana Harbor plant of the Inland Steel Co. there is little room left for expansion.

Electric Steel Production of the World

Record of the Leading Countries from 1913 to 1921—Post-War and Present Conditions—Pig Iron from Electric Furnaces

BY EDWIN F. CONE

THE world's production of steel in electric furnaces, as represented by the leading producing countries, was partly covered by an article contributed by the author to THE IRON AGE of Dec. 25, 1919, entitled "World's Output of Electric Steel and Pig Iron." It is now possible to cover the years 1919 and 1920 and much of the 1921 production.

Except in two or three countries practically no electric steel was made prior to 1913. In the United States, Germany and France, particularly the latter two, electric furnaces were making steel as early as 1908 and 1909. The industry, however, did not attain any magnitude until 1913. In that year Germany was its acknowledged leader.

1921, has varied with the peculiar conditions existing in each country. Data for the German speaking countries are not yet available, but assuming them to have been proportionate to those in other countries, the total for each of the three years present a strong contrast to those of the years preceding 1919.

Despite the falling off, however, the showing is a good one. The 1919 total for six countries is larger than the 1916 total for eight nations. The 1920 total for six countries, assuming Germany to have made as much as in 1919, exceeds the 1917 output for eight. In 1921, the year of world-wide depression and strikes, probably over 425,000 tons was produced by the six countries including Germany, or a figure nearly equal

Table 1.—Output of Electric Steel Ingots and Castings in the Leading Countries in Tons

	1913	1915	1916	1917	1918	1919	1920	1921
United States	30,180	69,412	168,918	304,543	511,364	384,452	502,152	169,499
Germany	88,256	131,579	190,036	219,700	240,037	55,382	....	....
Great Britain	None	22,000	46,709	98,592	115,448	77,000	89,100	27,100
Canada	None	*5,625	19,639	50,467	119,130	15,502	28,301	16,844
Austria-Hungary	26,837	23,895	47,247	47,152	41,163	....	....	....
France	21,124	21,000	44,429	54,031	58,222	42,559	58,080	24,457
Italy	....	22,387	22,376	36,948	†40,000	89,000	†100,000	†140,000
Sweden	2,276	2,187	6,648	10,664	†15,000	....	....	....
Total	168,673	298,085	546,002	822,097	1,140,364	663,895	777,633	377,900

*61 tons in 1914. †Estimated.

Due to the stimulus of the war, the electric furnace industry of all these countries expanded until the peak was reached in 1918, when over 1,140,000 tons was produced against only 168,600 tons in 1913. In this period, however, the United States gradually displaced Germany from the lead, with an output in 1918 nearly equal to that of the seven other countries combined.

The expansion up to and including 1918 varied with each year. The total output in 1915 was about 80 per cent greater than in 1913, while in 1916 it was about 90 per cent greater than in 1915. From 1916 to 1917 the increase was about 50 per cent, and from 1917 to 1918 the expansion was about 40 per cent.

The most striking feature of the growth of this industry up to 1919 is the relative progress of Germany and the United States. In 1913 Germany produced over 50 per cent of all the electric steel then made. Although the United States ranked second in that year, the industry had only just started. Germany and Austria-Hungary were credited with close to 70 per cent of the world's output in 1913. But by 1918 the situation had radically changed. Although Germany had increased its electric furnace production about 2½ times, the United States output had expanded 17 fold, easily leading all nations. Its output was not only twice the two so-called Central Powers, but it was not far from half of the total of all the producing countries.

Another feature of the development of this industry up to 1919 was the rapid growth of the British and Canadian production. In 1913 there is no record of any such industry in those countries, but in the four years 1915 to 1918 inclusive, this British industry had expanded five fold and the Canadian about 21 fold.

The progress of the industry as a whole in the readjustment period since the war, or in 1919, 1920 and to the output of 1913 and 1915 combined. This is no insignificant achievement.

American Record Since the War

In the United States the course of the electric steel industry in the last three years has been discussed at various times in the columns of THE IRON AGE. In each of the last three years the output has been large, nearly reaching in 1920 the second output in 1918. Even in the disastrous year of 1921, the total of 169,499 tons was over five times the 1913 production and in excess of the world's total at that time. Even in new furnace installations, 1921 showed a net gain of about 9 per cent over 1920.

The most striking features of the 1921 record, however, were the large increase in electric steel castings and the phenomenal rise in the output of electric alloy castings. The following table reveals this in gross tons:

	Total Electric Steel	Total Electric Steel Castings	Total Electric Alloy Steel Castings
1913	30,180	9,207	443
1916	168,918	42,870	926
1918	511,364	108,296	3,076
1920	502,152	155,196	11,710
1921	169,499	85,095	10,084

The broad expansion in the electric steel casting industry is evident from these figures, the progressive increase having been very large since 1913—reaching the maximum in 1921 at over 50 per cent of the total electric steel production. Still more significant is the fact that last year, of the total output of electric alloy steel ingots and castings, 15.9 per cent was alloy castings. In 1920 this proportion was 6.50 per cent and in 1917 and 1918 only about 1 per cent. The broader use of electric alloy castings, in some industries as sub-

stitutes for forgings, is the explanation. The trend of the American electric steel industry in 1921 demonstrated the firm hold of the electric furnace in the steel foundry.

Broad Expansion in Italy

The outstanding feature among the other electric steel producing countries has been Italy. As shown by Table 1, the Italian electric steel industry has risen from a relatively low position six or seven years ago to a commanding one at present or second last year to the United States. Reliable data indicate that there are at least 180 electric furnaces in the Italian steel industry, among which are several 20 to 25-ton furnaces and about 23 furnaces of the 15 ton capacity. A large number of them are the Heroult type, but the rapid introduction of the Fiat and other Italian types is a feature.

British Post-War Progress

British data recently published call attention to the considerable expansion in number and size of the electric furnaces since 1914. The following table gives the number and size of such furnaces in Great Britain at the beginning of 1922:

Unit Capacity	Number of Furnaces	Capacity per Charge, Tons
5 cwt.	1	0.25
6 cwt.	1	0.30
½ ton	15	7.50
18 cwt.	2	1.80
1 ton	5	5.00
1¼ tons	1	1.25
1½ tons	19	28.50
2 tons	20	40.00
2½ tons	3	7.50
3 tons	18	54.00
3½ tons	6	21.00
4 tons	5	20.00
5 tons	3	15.00
6 tons	11	66.00
7 tons	10	70.00
7½ tons	2	15.00
10 tons	8	80.00
15 tons	2	30.00
20 tons	1	20.00
Miscellaneous (estimated at 1½ tons)	15	22.50

The data also show that 16 companies had some 21 electric furnaces in their equipment during 1914 and that this score of furnaces ranged within the narrow limits of 1 to 3¼ tons per charge. In 1922 there are nearly 150 installations with a range from 5 hundredweight to 20 tons per charge, the majority holding around 2 tons, but 60 or more of them being in the 3-ton class or larger. In 1921 an electric furnace was started in a steel foundry in Ireland, the first one in that country.

Because the circumstances surrounding the operation of electric furnaces are so uncertain, an authoritative estimate of the annual British potential output has remained largely stationary so far as output is concerned. There was a decided drop in 1919 with a moderate increase in the post-war boom of 1920. The interesting feature has been the marked proportionate increase in electric steel castings, shown by the following table in gross tons:

In 1919 the electric steel casting output was 43.6 per cent of the total; in 1921 this had expanded to 83.2 per cent, a still more striking example of the growth of the electric steel casting industry.

	Total Electric Output	Total Electric Ingots	Total Electric Castings
1919	15,502	8,741	6,761
1921	16,844	2,860	13,984

German Electric Steel

For Germany the only post-war data available thus far are for 1919. In that year German electric furnaces produced only 55,382 tons against 240,000 tons in 1918 and 88,256 tons in 1913. An explanation is that the partition of Germany as a result of the war removed several important electric furnace producing districts. There are good reasons for believing that it will be some time before Germany can regain a leading position in the world's industry, and that the American and Italian industries will for some years predominate.

No data regarding Austria nor Hungary are available since 1918 and nothing has been found as to Sweden's output.

Pig Iron Made Electrically

Two kinds of pig iron are being made in electric furnaces: The regular reduction of iron ore by means of electricity and coke or charcoal; and the production of synthetic iron or the re-conversion of steel scrap into pig iron or iron castings.

Sweden, Norway and Italy have always led in the former, while France and Canada are the most active in the latter. The war was a great stimulus to this industry, particularly the synthetic iron. Table 2 presents such data as are available covering both kinds of iron over a period of years. The United States during the war made some synthetic iron, but the exact data are not available.

The future of the industry is full of promise. As more normal conditions return in all countries, the use of the electric furnace for making steel will broaden. Statistics for 1922 and later will show a large proportionate increase over 1919 to 1921, because the record of 1919 to 1921 is, under abnormal economic conditions everywhere, a strong contrast to the more meager outputs in the early pre-war years. The 1921 production of five countries was over twice that of six in 1913, or 377,900 tons against 168,673 tons.

Table 2.—Output of Electric Pig Iron in the Leading Countries in Tons

	1913	1915	1916	1917	1918	1919	1920
France	....	....	....	13,691	32,031	7,701	8,835
Sweden	28,753	....	....	†150,000	....	....	59,656
Italy	....	35,075	44,782	67,059	....	....	....
Norway	....	3,800	17,298	56,524	....	....	....
Canada	....	*8,742	....	6,295	9,007	....	....

*160 tons in 1914. †Estimated.

is not advisable. The maximum output was reached in the year 1918. While small, then, this industry has made but little progress. The most striking fact is the following: In 1915 the British electric steel output was 22,000 gross tons, of which only 2000 tons were castings; in 1921, though the total was only 27,100 tons, 16,700 tons were castings, another case of the predominance of the electric furnace in the steel foundry.

Since the war the Canadian electric steel industry

A post-war development in the American industry of wide interest, importance and possibilities is the application of electric furnaces to the iron foundry in refining cupola iron or in the direct melting of scrap. No statistics of the output of electric iron castings are available, but the industry is rapidly broadening. In the steel industry as a whole, not only in the United States but in the other nations here considered, the electric process has established itself as essential in certain fields.

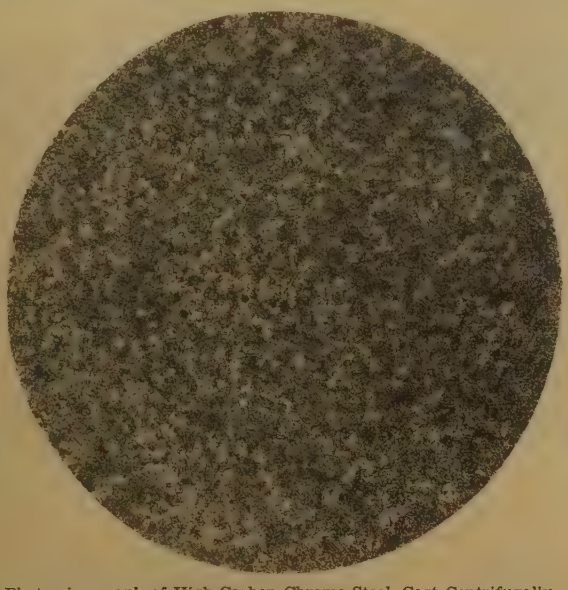
Chromium Alloy Steel Cast Centrifugally

Annealed, It Has the Same Structure as Mechanically Worked Metal, from Ingots Cast in Stationary Molds—Dendritic Structure Absent and Grain Structure Small

BY L. CAMMEN

ONE of the most interesting and at the same time difficult problems in steel metallurgy is the production of good high carbon chromium steel such, for example, as is now used for ball-bearing races. The problem has been solved to a large extent by several manufacturers of this material, but only at a cost of a large outlay in time and money devoted to experimental work. The process as used to-day is still fairly expensive and requires the utmost care in order to give the high grade material which the better class of ball bearings manufacturers insist on getting.

In good steel for ball-bearing races the carbon should be around 1.1 per cent and the chromium about 1.5 per cent, although slightly different proportions may give good results with proper handling and heat treatment. When cast in a stationary mold, the ingot has a clearly dendritic structure, with large, coarse grains, and the carbide is almost entirely in solution.



Photomicrograph of High Carbon Chrome Steel, Cast Centrifugally and Heat Treated. Etched in picric acid. Magnification 100 dia.

To obtain a finer grain structure, the ingot has to be worked; an 8-in. sq. ingot, for example, is "welded" under a hammer into a 6-in. sq. billet. The forging must be done at a good red heat and with powerful blows, and requires great care and expert attention to temperature and the handling of the hammers, which naturally affects the cost of the product.

At the same time there are certain conditions in the structure of the metal which steel for ball bearing races must satisfy, viz., the grain must be fine, there should be no appreciable excess of cementite, and the cementite in the pearlite should be all "globularized." This latter is very important because, as pointed out by H. C. Ihsen in a recent issue of *Forging and Heat Treating*, steel with the cementite in the spheroidal condition shows excellent wear-resisting properties, as the small globules of cementite, which are very hard, will resist wear, while the soft ferrite matrix gives ductility to the material.

Hitherto the spheroidization of the cementite has been obtained by annealing, and the production of the fine grain by expert hot working (forging) of the billet. That the latter part of the process is not necessary is proved by the photomicrograph herewith reproduced of a ring of high carbon chromium steel taken from a centrifugally cast steel tube. As shown by this, the structure of the metal is purely pearlitic, no excess of cementite being present; the pearlitic grains are small, notwithstanding the fact that the casting has not been subjected to any mechanical working, either hot or cold, the tube having been simply annealed as cast and cut into rings.

This is, the writer believes, the first instance that a casting in alloy steel has shown the same grain on annealing as a forged billet, and opens up important theoretical and practical possibilities, indicating that it is possible to *cast* steel in such a manner as to avoid the dendritic ingot structure, a fact which has been repeatedly stated by the late Dr. Henry M. Howe.

Just why centrifugal casting in this case has given such a fine structure it would be difficult to say at the present time. The metal was cast in a rotating mold having a temperature, at the time of the casting, of about 1700 deg. Fahr. The cooling of the metal was therefore comparatively slow and, in a stationary mold operated under the same conditions, one would have obtained columnar crystals and a coarse grain structure. And yet, in a spinning mold one gets a fine structure similar to that of a well-forged material.

The most likely explanation is that it is the mechanical stirring due to the rapid rotation of the mold (1400 r.p.m.) that affects the grain size, and possibly also the powerful impingement of hot particles of the metal on the layer next to it outwardly; then, in the process of freezing, this impingement may prevent by purely mechanical means the growth of the crystals and the peculiar ingot dendritism.

In any event, at least for ball-bearing race steel, it is now possible to produce by simple casting and annealing, a material equal in structure to a forging, and thus eliminate the forging operation, a fact which any steel man who has had to carry the forging department payroll, will have no trouble in appreciating.

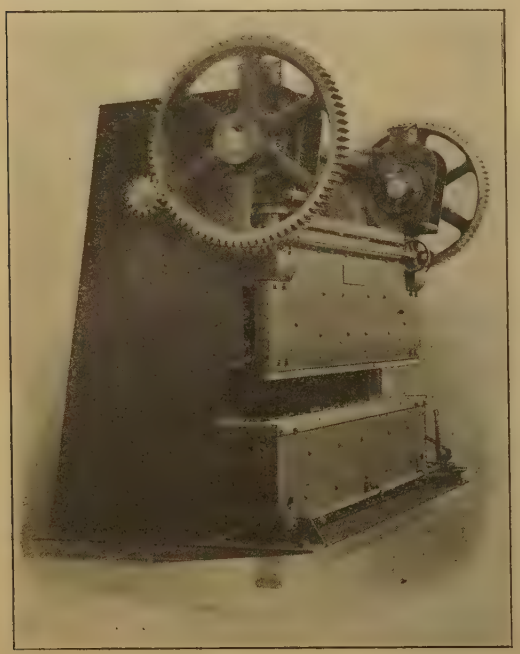
Despite the fact that the shortage of cement has delayed the completion of many paving and concrete road projects throughout Michigan, building permits for the first week in Detroit reflect optimism. These permits cover 297 new buildings, costs estimating $5,196,105 comparing with $1,856,445 for the preceding week.

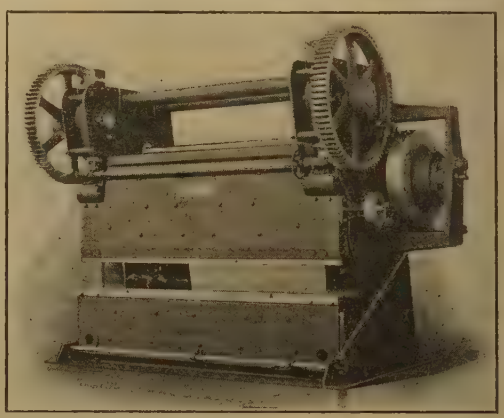
NEW HEAVY FORMING BRAKE

Steel Plate Construction and Open Throat Housing—Erection Simplified—Speed Increased

A line of all-steel power press brakes in capacities from 50 to 600 tons, for material from No. 16 gage to ¾ in. thick, and incorporating new features has been brought out by the Cincinnati Shaper Co., Cincinnati.

The advantages claimed for the new machine include maximum strength and power with minimum weight and greatly reduced deflection as compared with previous machines of corresponding capacities. Open-throat construction, reduction of the headroom required, quick action and increased operating speed, unusual ease of installation and erection, and a greater factor of safety than usual are also features emphasized.





The Cincinnati Shaper Co.'s Brake for Forming Heavy Sheet Metal and Plates Is Now Built of Steel Plates with Most of the Parts Electrically Welded Together Rather Than Riveted or Bolted. The open-throat construction, with clear working space in front of the machine, and space between the housings in the rear for operating or stacking sheets, are features

Outstanding changes in design are the employment of steel plate in the construction and the use of the open-throat type of housing to give a clear extended working space in front of the machine and to facilitate the handling of material. As most bends are made near the edge of the plate, the full length of the die-holding surface can be utilized. Thus, it is pointed out, for most classes of work this type of machine can be rated according to the length of the die-holding surface instead of the length between the housings. This feature is emphasized also as permitting of a narrower and more rigid machine, with a saving in cost and floor space. The space between the housings in the rear of the machine is available for operating or stacking sheets, and work requiring more than one operation may be passed through the machine, the turning of work end for end being eliminated.

To a large extent bolts and rivets have been eliminated by electric welding many of the parts, uniting the component members of the machine in a way that gives the effect of a solid unit rather than that of a built-up section. Where bolts are used in the solid members to draw plates into place, the bolts themselves are welded as well as the plates, so that they become an integral part of the member and remove the danger of working loose.

The driving mechanism is entirely contained within the housings, the latter being shipped with the mechanism assembled, it only being necessary to place them on their foundations and attach the cross members and drive shaft. The machine is shipped as four main pieces with the drive shaft and cross brace in addition, making six pieces to be assembled. To aid in the erection of the machine, self alining features have been incorporated.

The bed and ram are of heavy plates and bars, which with the cross ribs are welded to each other, this construction serving to make a heavy, solid beam of box section with the metal placed where needed. The housings are framed of steel plate with cast steel members interlocked and welded to the plates. These members are provided with heavy trunnions for supporting the bed. A large factor of safety has been used, it is stated, thus to provide additional strength against accidental or excessive overloading.

Automatic sight feed lubrication is provided on all power-driven bearings. The flywheel, clutch, worm and worm wheel in the ram-adjusting device, and the power drive for this, all run in a bath of oil. Shafts are of high-carbon steel, the eccentric shafts being 0.50 to 0.60 per cent carbon forgings with the eccentrics forged integral with them. Main-drive bearings are of special bronze.

A splined trip shaft running the full length of the machine has mounted on it a foot treadle which permits the operator to engage the clutch from the most convenient position. The ram is gibbed endways as well as sideways, which is essential when using the machine as a gang punch.

The machines have been designed to operate at a greater number of strokes than usual, thus increasing productive capacity. When motor driven, the motor is mounted on a bracket attached to the housing, the drive being through a belt held in tension by a weighted idler on the slack side. The flywheel is mounted on ball bearings. Cut gears and steel pinions are used throughout. The clutch, it is stated, has been especially developed for the machine and accessibility and simple adjustment are features. It is of the multiple-disk type, operated in oil and low unit pressures are used in its operation.

Widths between housings are from 6½ to 14½ ft., and the weights of the machines from 18,000 to 120,000 lb.

The Westinghouse Electric & Mfg. Co., which now is working on an order for 120 electric locomotives for Paris-Orleans Railway, France, recently was awarded the contract for the electric control equipment.

The Three-Shift Day at Steel Works

A Special Report by Bradley Stoughton to the Federated American Engineering Societies Puts Cost of the Change Below Common Estimates

IN view of the investigation of the same subject now being made by a committee of the American Iron and Steel Institute, headed by the institute's president, Judge E. H. Gary, special interest attaches to the report on the three-shift day at iron and steel works, which was prepared recently by Bradley Stoughton, consulting engineer, New York. Mr. Stoughton, after a period of plant experience and of consulting work, was for a number of years secretary of the American Institute of Mining and Metallurgical Engineers and is the author of a well-known work on the Metallurgy of Steel. His report on two-shift and three-shift operation was presented on Friday, Sept. 8, at a meeting in Boston of the executive board of the American Engineering Council of the Federated American Engineering Societies. At the same meeting Horace B. Drury presented a voluminous report on "Two-Shift and Three-Shift Operations in the Continuous Industries." Mr. Drury is the author of a paper on the "Three-Shift System in the Steel Industry," which he read before a joint meeting of the Taylor Society and the Metropolitan and Management sections of the American Society of Mechanical Engineers in New York, Dec. 3, 1920. This paper was the result of an investigation Mr. Drury had made for the Cabot Fund, Boston. Mr. Stoughton's report is based on an investigation he carried on, also under the auspices of the Cabot Fund.

Progress in the Direction of the Shorter Work Day

Mr. Stoughton's report consists of 51 closely typewritten pages and the subject is considered under 19 sectional heads. Beginning with historical data, these sections treat of the reasons why the 12-hour day exists in the iron and steel industry, technical considerations in changing from two shifts to three shifts, cost of labor under the three-shift and two-shift systems, labor cost in relation to total costs, handling of peak labor loads at the blast furnace and at open-hearth furnaces, possible economy in rolling mills, consequences that must be realized if the change from two shifts to three shifts is to be a commercial success, and other considerations. Mr. Stoughton's own summary of his report is as follows:

THE 12-hour day is strongly established in the iron and steel industry by long custom, and by its unusual adaptability to the requirements of this industry. However, recent progress in the industry has been in the direction of a shorter work-day, as well as a reduction in the proportion of those men who are on duty for seven days a week.

Peak Loads: An Original Cause for the Persistence of the 12-Hour Day

For some decades past the labor requirement of the iron and steel industry has included some peak loads of great intensity, from the standpoint of physical endurance, or of heat exposure, or both. Between these peak loads will come periods of rest, or of very light labor. This type of labor requirement has been due in part to the special liability of iron and steel furnaces, rolling mills, or accessory apparatus, to break-downs, which necessitate intense activity of the "maintenance men" until they are repaired, with consequent idleness of the other men. Another cause of peak and valley loads is the nature of the operations themselves: For example, during and immediately after the "tapping" of blast furnaces or open-hearth furnaces all hands are subjected to severe labor. The same is true of the charging of the old-fashioned type of open-hearth furnace. This makes it almost imperative to rest thereafter, in the case of all three examples.

Recent improvements in equipment, and the adoption of electrical appliances, have greatly decreased the frequency and the duration of interruptions of the different processes due to break-downs, especially in the rolling mills. Also mechanical and other labor-saving devices have lessened the severity of peak loads due to the processes themselves, both in respect of physical endurance and heat exposure.

Notwithstanding the improvements mentioned above, break-downs still occur at times, and the labor requirements of some of the processes are still variable. For this last reason, and because of habit due to established custom, it is usual to allow the men periods of rest while on duty, with the result that the 12-hour shift is not always over-taxing, and the 8-hour shift is sometimes too short from the economic standpoint to employ the energy of the men to the best advantage. But this is not always so. When the blast furnace "goes on a bum"; when emergencies arise in other departments; and often when a mill runs without interruption and with unusual vigor, the 8-hour day is long enough for any workman, and it is not uncommon to meet emergencies when all hands are occupied with severe labor and scarcely any opportunities for a few minutes rest for 12 consecutive hours.

In the majority of cases, however, labor at the blast furnaces and open-hearth furnaces is more or less variable and irregular. The more efficient, alert and careful the laborers, the less will emergencies arise, and the less the break-downs. This has been urged as one of the advantages of the 8-hour day, because the men are more alert and efficient.

Labor-Saving Devices Promote the Economy of the 8-Hour Day

To work three crews instead of two crews per 24 hours involves the necessity of increasing the labor costs per day, unless either daily wages per man are reduced, or else any four men, working only 8 hours per day can do as much mork as six men working 12 hours. It is obvious that the six men will be almost as efficient and productive per hour as the four men, provided they have so much resting time as to keep them in good condition. Therefore, anything which tends to eliminate peak loads and idle periods increases the relative efficiency per day of the 8-hour men as

compared with that of the 12-hour men, and consequently decreases the added labor cost per ton of working three shifts. Labor-saving devices also reduce the labor cost per ton, by actually eliminating some of the labor; this factor renders less serious an increase of the proportionate labor cost. (For example: If labor costs $1 per ton on the 12-hour system, and it must be increased by 20 per cent to adopt the 8-hour system, then the increase will be 20c. But if, by means of labor-saving devices, the labor costs are reduced to 60c. per ton on the 12-hour system, then a 20 per cent increase will only amount to 12c, per ton.)

To the last argument objection will be made by some that cost reductions due to labor-saving devices should benefit the stockholders rather than the workmen; but this suggests the general principle stated elsewhere in this report, namely, that the main object is to run the industry economically under competitive conditions. The investigator has found that the majority of managers and executives interviewed believe that if by means of labor-saving devices the plant can be commercially operated upon an 8-hour shift system instead of a 12-hour system, the good of the industry can be better served by eliminating the 12-hour shift than by increasing dividends.

Some Plants Having the 8-Hour Day Are Operating With Commercial Success

The circumstance that already many plants are operating successfully under competitive conditions on the three-shift system, indicates that profits need not suffer, if the change is made with wisdom. Opponents of the three-shift system explain these instances by declaring that they find always some special condition in the case of every plant that employs successfully the three-shift system: Either they are owned by the interest that purchases their product, and so do not have to compete, or else they are making a special product at a special price, or they are geographically removed from the center of competition, etc. But this argument does not always hold; although it applies in many such cases. And, even if it did hold good, it would not prevent the experience of these plants applying generally in the industry, because there are special circumstances operating in every iron and steel district of the country, whereby each has an advantage or disadvantage in competition which is far greater than the labor cost per ton as influenced by this problem. For example, it is well known that the cost of labor which must work at the blast furnaces either on the 12-hour shift or the 8-hour shift is well under $1 per ton of pig iron. If this sum be doubled it would still be small in comparison with the advantages some companies have because of wise purchasing policy, technical skill, low overhead and ample capital. Judge Gary recently (June, 1922) testified before the Lockwood Committee in New York that the United States Steel Corporation could produce at $3 per ton less than its competitors.

Conditions to Be Assured in Advance and Conditions to Be Avoided

The experience of those who have made the change from the 12-hour shift to the 8-hour shift with commercial success gives very definite information as to the conditions which must be prepared in advance in order to produce the desired result; they include:

1. Having the equipment in satisfactory condition;
2. Assuring the co-operation of the men in the change;
3. Assuring that the necessary labor will be available.

Likewise this experience indicates what conditions must be avoided if the change is to be made without disaster to the industry. For example, the change should not be made:

1. During a period of labor unrest;
2. After strife, or when bitterness is rife and mutual confidence is lacking;
3. When labor is arrogant or elated by a defeat of the management;
4. Making too sudden changes;
5. Any conditions which lessen the power that management can exert on labor to prevent misuse of the extra hours of free time, tardiness, absence, deliberate shirking, etc., will defeat the commercial benefits of the three-shift system.

The fear has been expressed that if 12 hours pay were given for 8 hours work, the men would soon ask for 12 hours work at the advanced hourly rate. Concerning this there is a difference of opinion, with a rather general agreement that foreign laborers want to make the most money that the work will bring, regardless of how many hours they labor, but that the better class of laborers, and Americans, are satisfied with the shorter day if it brings a living wage. The remedy that has been applied with apparent success to the discontent which some show with the 8-hour shift is a very simple one, namely: Precede the change from 12 to 8 hours' work by time observations to determine how much the crew could produce if working at some greater efficiency; then pay the same hourly rate for 8 hours as for 12, but add a bonus so adjusted that the men will earn the same daily wage as before, provided they work hard for 8 hours. It is said with some positiveness that, if the crew works as diligently as it can for 8 hours, none of them will be agitating for 12 hours' work, and it is also said that the crew itself can be relied upon to see that every man does his work without shirking; disciplinary measures are not necessary for this when a bonus depends on the result. The working of this plan was so good at one plant that the manager declares that 8 hours' work with a bonus will pay for itself.

When wages are paid to the 12-hour men on the tonnage basis, they have an incentive to work hard and it is not reasonable to expect any greater efficiency for 8 hours' work, unless the men are actually more capable on the shorter shift.

Disadvantages of the 12-Hour Shift

In some departments of the iron and steel industry 12 hours' work has been found too long for the men, and it is customary to have "spell hands" to relieve them at intervals. In one case, at least, the crews are actually doubled, and each man works only one-half the time. Where the work is not so continuous, with peak and valley loads, the 12-hour duty is not overtaxing, but here there arises another very serious objection. It is customary for the night men to work 13 hours and the day men 11 hours; in cases of emergency at the furnaces (at the blast furnaces this is technically known as "going on a bum"), the night men, exhausted by 13 hours of taxing labor, often find it impossible to get sufficient rest in their congested homes, especially in hot weather and when the children are at home from school. It is then not a matter of being exhausted by the labor, but of not having sufficient resting time between periods, so they return to their work with lowered efficiency. On the 8-hour shift they always have time to rest, and always some hours for sleep during darkness and when the rest of the family is quiet and when it is comparatively cool.

To deliberately permit laborers to loaf while on duty is wrong from the standpoint of morale and discipline. A few minutes breathing spell after exertion may be wise, but the peak and valley loads of the iron and steel industry require more than this, when operating on the 12-hour shift. We now tacitly accept the sight of men idling, resting, and even sleeping, on duty, as a relic of the days before the severe labor was performed by mechanical appliances, and are apt to forget that the principle of sleeping during paid time is evidence of economic waste. At some plants, sleeping on the night shift is not officially tolerated, but the practice is allowed to go unobserved, when the men are not needed. On the three-shift system rest or sleep during working hours is not necessary, even at the blast furnace.

Advantages of the 8-Hour Shift

Results from working the 8-hour shift have disclosed the following economic advantages, which compensate in part for the extra cost of working three crews instead of two. It is not to be supposed that all of these advantages will be experienced in every case and in every department, but any of them may result when the hours of labor are reduced below 12 per day,

(*Continued on page* 689)

Bituminous Coal Moving More Freely

Relief Coming to Many Industries—Large Increase in Number of Cars Loaded—Legislation Enacted at Washington

WASHINGTON, Sept. 12.—That industries of the country have already received relief from the fuel and transportation situation is indicated by a growing production of soft coal and the increased movement of cars. While distribution of coal by the Government is to be continued on the strength of legislation passed to that end as well as to prevent profiteering through a system of car distribution, there is no longer any concern as to supplies of bituminous coal. Transportation is the outstanding problem. This, however, seems to be growing less serious, as is evidenced by the action of the Interstate Commerce Commission in exempting all open top cars with sides 42 in. and under in height from being given preference as to coal loading. It is estimated that this adds 34,000 cars for use by industries of the country over and above 62,000 open top cars which did not come under the preference ruling.

The success of the railroads in loading cars with coal is shown in the report of the Association of Railway Executives which says that 167,428 cars were loaded with coal during the week ended Sept. 2. This was the largest number of cars loaded since the strike of miners began on April 1 and also exceeded the preceding week by 49,610 cars. The railroads also are reducing the number of surplus cars, as is shown by the fact that on Aug. 23 there were 120,961 surplus freight cars, representing a decrease of 19,292 cars compared with the total on Aug. 15. Subsequent reports show further improvement.

Movement to Great Lakes Region

Movement of coal to the upper Great Lakes region under the program of the Federal fuel distribution committee is proceeding satisfactorily. It is estimated that a lakeward movement of 800,000 tons was attained last week. The coal from West Virginia and Kentucky districts directed lakeward under priority orders is now arriving at lake ports in considerable quantity and comprises a large percentage of present dumpings at these ports. Lake coal now being loaded is moving almost entirely under its natural Class 2 movement and with only a very limited application of the No. 1 priorities. A problem in the transportation of lake coal has arisen because of delays in the unloading at lower lake ports of cargoes of iron ore from the Northern ranges from boats which carry coal on their return trips to Lake Superior ports. This delay in unloading ore boats which has been occasioned by deficiencies in the railroad car supply, will be obviated, it is hoped, by the issuance of special permits for the use of cars to transport iron ore.

While enough coal is being mined to take care of the country's current needs, the supply is not yet sufficient to provide for proper storage demands and for the special lake program in addition to general current requirements. Instructions were given last week to the various district coal committees to wind up the affairs of their offices with the completion of priority orders of the committee.

Fact Finding Commission

Legislation for coal distribution and establishing of a fact-finding commission with regard to the coal industry has been passed by both branches in Congress. The Senate fact-finding commission provides for five members to investigate the coal industry and make recommendations. The House bill fixes the membership at nine. By an amendment adopted, the Senate measure calls for separate and distinct inquiries in the soft and hard industries. The general purposes of the two measures, however, are similar. The Senate bill provides that work of the commission shall be begun immediately after its members are named and that a report on the soft coal industry shall be made within five months after the law goes into effect, while the report regarding the anthracite coal industry is to be made on or before July 1, 1923. The commission also is called upon to make a study and report regarding the wisdom or advisability of nationalizing the coal industry. This was the subject of sharp debate in the Senate, as was also the question of Government regulation and control. The other bill covers car distribution for coal shipments and is designed also to prevent profiteering. Arguments were made by some members of the Senate that this legislation is unnecessary and that it would have been better to allow the law of supply and demand to operate, for the benefit of the public, as well as of the coal industry itself. There are those who think that the supply of coal will within a short time be so great, provided the transportation situation is satisfactory, that fuel will be selling under prices agreed upon by the Government and operators.

Moderate Increase in Production in Connellsville Region

UNIONTOWN, PA., Sept. 9.—Observers in the Connellsville bituminous region, with the Labor Day demonstration, in which 10,000 men marched as affiliated with the United Mine Workers, still fresh in their minds, are declaring that the strike in the non-union district here has been broken. Union leaders declare that their cause is stronger than ever, but the appeals being sent out for financial assistance and developments during the past few days hardly carry out that conviction.

Yesterday the tent colony at Filbert folded up their tents en bloc and flitted away—to Cokeburg, where the miners of the colony are reported to have gone to work.

The number of evictions in the region has been increased during the week, an average of nearly 100 eviction warrants a day being issued. Further temporizing, apparently, has been done away with on the part of the companies, which are determined to resume operations at capacity and have been permitting some of their old employees to remain in company houses with the hope that they would return to work. The situation now apparently has narrowed down to the fact that the companies have given the old employees their last opportunity to return to work and are making places now for men who are coming into the region by hundreds.

W. J. Rainey, Inc., this week prepared to resume on an intensive scale and several hundred imported workers have been sent to their plants in the region. Arrival of one large group was the signal for the explosion of dynamite in a field near Royal, apparently to intimidate the new arrivals. No damage was done.

A trip over the county shows unmistakably that the coal and coke industry is on the upgrade. At night the flare of coke ovens is a welcome sight again and the shipments on the railroads tell the story of increased production with even more effect than do the production figures.

The H. C. Frick Coke Co. alone added 300 ovens to its active list this week. Estimated production of coke

in the Connellsville region during the week ending Sept. 2 was 90,300 tons, an increase of 4200 tons over the preceding week. The production for the week ending Sept. 9 will show an even greater gain.

Operators already are giving serious consideration to the prospect for car shortage. The strike situation has ceased to be a problem insofar as there was any doubt as to the success of the campaign against unionization of the field. The fight put up by the H. C. Frick Coke Co., backed by some of the larger independent companies, has brought its result, in the view of most observers, and the union has again failed in its efforts in the region. Of course the battle is not entirely over and the union leaders will not give up the region without a struggle, for they realize that this will mark the last chance of unionizing the field. The county has lost several hundred of its miners who have moved to other fields, West Virginia, principally; but many observers declare that the majority of these will return to the Connellsville region when the present tensity has been relaxed. Coming into this field are hundreds of experienced mine workers, some from union fields. The high wage scale, equal to that of the union and without the union checkoff, lures many men.

Many of the mines now operating signed the scale with the union in order to take advantage of the present situation, protect their investments and make a good profit before the bottom drops out of the market as production figures soar. Coal is selling now at $4.75 and $5 in this region. Car shortage may hold this price all through the winter, but if there is an adequate car supply, many observers look for a lower price.

Transportation Is the Controlling Factor

WASHINGTON, Sept. 12.—Pointing out that the limiting factor in the supply of soft coal has now become transportation, the Geological Survey says that instead of the 9,400,000 tons suggested by the first report, final returns on soft coal production show only 9,142,000 tons in the week ended Sept. 2. The record of the week was awaited with interest as an indication of the supply to be expected after general resumption of mining under the Cleveland agreement. For the week of Sept. 4-9, because of the Labor Day holiday, the Survey says that the output can hardly exceed 8,700,000 tons. On Labor Day, 10,021 cars were loaded by non-union mines, confirming the experience of other years, that the day counts for a third of an ordinary working day. The double holiday on Sunday and Monday increased the number of empty cars available for placement on Tuesday and on that day 33,085 cars were loaded, the largest number for any day since last March. On Wednesday, Sept. 6, however, loadings dropped to 30,652 cars and on Thursday to 28,238 cars.

It is true that some thousands of miners are still on strike, notably in the Connellsville and Kanawha districts, but the tonnage offered for shipment by the other mines at work will absorb the available transportation facilities, says the Survey. It adds that the demand for coal is active and prices are high. Under such conditions coal is offered for shipment up to the limit of the ability of the railroads to transport it.

Dealing with the by-product and beehive coke situation in August, as affected by the coal supply, the Survey says:

> Shortage of coal cut deeply into the production of by-product coke during the month of August. The total output was 1,794,000 net tons, a decrease when compared with July of 692,000 tons, or 28 per cent. The average daily production in August was 57,858 tons, as against 80,182 in July. The ovens operated at 48.9 per cent, or less than half of capacity. Of the 71 plants, 57 were active and 14 idle.
>
> These statistics are based upon reports from 67 plants and include estimates for four small plants not heard from at the date of publication.
>
> The loss in by-product coke was in part compensated for by an increase of 89,000 tons in the production of coke at beehive ovens. A gradual recovery from the strike in the Connellsville district brought the output of beehive coke from 450,000 tons in July up to 539,000 tons. The total of all coke produced—2,333,000 tons—was 10 per cent above the average for 1921, though still 46 per cent short of the 1920 average.
>
> To produce the coke manufactured in August required 3,427,000 tons of coal, of which 2,577,000 tons were used in by-product ovens and 850,000 tons in beehive ovens. The cut in consumption in by-product plants was nearly 1,000,000 tons as compared with July. The districts in which the greatest difficulty was experienced in obtaining coal were Buffalo, Baltimore, Youngstown, Cleveland, Pittsburgh and Chicago. In New Jersey, New England, the South and the Far West no great curtailment of operations was reported through failing coal supply.

Detroit Expects Ample Fuel Supply

DETROIT, Sept. 12.—The consensus of opinion among coal and railroad operators that Michigan will receive an ample fuel supply for current needs seems to be substantiated by the receipt of 3100 cars in Detroit during the past week. Industries in general have not suffered as yet. Dependent upon car supply, Michigan should receive from 60 to 80 per cent of its normal fuel requirements. This will not permit of any reserve stacks being piled. Two of the railroads operating in the State have placed an embargo on open top equipment excepting the low-sided type, and with the improved railroad situation manufacturers are planning production schedules for the remainder of the year. The Ford company's scheduled closing on Sept. 16 seems to be more probable as the date approaches. Suspension of shipment to the Ford plants has been to the advantage of other consumers, as it has released a large portion of the D., T. & I. equipment for general fuel delivery.

Persistent rumors indicate that at least two local automobile manufacturers will cut their production in half by Sept. 15. A general survey of the industry, however, shows a production schedule equalling August figures, with enough orders already placed with parts and accessory manufacturers to keep them busy until Jan. 1. The Detroit Employers' Association figures show 178,000 now employed as against 177,000 a week ago, and indicate that unemployment is below normal.

The recent action of the Interstate Commerce Commission in relieving certain types of open top equipment, heretofore listed as coal carriers, has given contractors and builders some hope that the present shortage of building materials will be relieved.

Sheet quotations show an upward tendency, 3.75c. being the prevailing price on black and 4.75c. for galvanized. Manufacturers are receiving a sufficient supply for their weekly needs, and probably the shortage of sheets is no more acute than many other materials. In general, Detroit industries are receiving current supplies on all materials.

The Lockhart Iron & Steel Co., Pittsburgh, which several months ago acquired the plant of the Sligo Iron & Steel Co., Connellsville, Pa., soon will start operations at the purchased unit. Extensive alterations have been made in the Sligo works, which now has 21 puddling furnaces. J. Porter Gillespie is manager of the Sligo plant.

The force at the plant of the Robbins & Myers Co., Springfield, Ohio, has been increased this week. It is expected that by Oct. 1 the company will have greatly increased its force and that all departments will be in operation.

The Nicholson File Co. and the American Screw Co., Providence, R. I., effective Sept. 5, have advanced wages of all plant employees 16 2/3 per cent, and will operate on a full-time schedule.

German Price Advances Causing Uneasiness

Mills Heavily Booked, But New Building Work Checked —Dollar the Standard Unit of Reference Selling on a Sliding Scale

BERLIN, GERMANY, Aug. 25. — Present price increases assume dimensions which make business exceedingly difficult. Even trades which sold at fixed prices, with a certain increase in case of rising wages, are now reverting to prices on a sliding scale altogether. The dollar is now to a great extent the standard to whose fluctuations most trades adjust their prices, having lost all other bases for calculations. In some cases manufacturers and traders are increasing prices in advance of the depreciation. Most of the daily papers have the exchange value of the dollar printed every day in a prominent place and complaints about the spasmodic increase in the prices of commodities, etc., are even by the small shopkeeper retorted with a "Well, but look at the dollar!"

The rapid increase in cost of production has led to a suspension of building at several large works and there is less demand for labor. The increases in the wages in all trades are considerably behind those taking place in the prices of commodities and there is already considerable unrest among the workers and the salaried employees. Wages are about 60 times pre-war standard while foodstuffs alone have gone up to over 100 times pre-war prices.

Most firms in the iron trade have orders to last them till February, 1923. Wholesalers who had a stock of at least a thousand tons in ordinary times have hardly two hundred tons now; and any supply coming in is going straight to firms using the material. The insufficient home supplies have led to greater imports of Luxemburg, Belgian and French iron, which can be had within about a fortnight. The advances in foreign ore and coal has also greatly enhanced the capital requirements and bank credits have to be relied upon to a greater extent, which the banks are very careful in granting. In some industries as much as 50 per cent of the price is asked with the order. As private firms find it increasingly difficult to provide the large amounts of capital involved, and especially in buying raw material, quite a number of them are being transformed into joint stock companies.

Further Industrial Concentrations

Meanwhile concentrations in the industries and increases in capital are assuming great dimensions. The Siegen-Solingen Gussstahl Aktien Verein is increasing its capital to 114 million marks by the issue of new shares. The amount raised in this way (52.8 million marks) is to be used especially for the erection of new works at Gross-Kayna and for other enlargements of the concern.

A new combination similar to the Rhein-Elbe Schuckert-Union, which had been formed under the leadership of Stinnes, is now being developed. It includes the mining concerns of Phoenix and Rheinstahl, the Dessauer Gas Co. and the two electrical firms Sachsenwerk Licht und Kraft A. G. and Max Schorch & Co. A. G. Negotiations to include the General Electric Co. have not been successful. The Phoenix A. G. plans to build a new electric power station, a tube works, a Bessemer plant, and several blast furnaces near Düsseldorf and Hörde. The General Electric Co. (A. E. G.) has acquired the Iron and Steel Foundry of Hartung A. G. in Berlin in order to secure regular supplies of castings to its works.

The great works in the iron industry were prosperous last year which is also shown by the 1921-22 returns of the Becker Steelworks. The gross profit amounted to 123.9 million marks (44.8 million in the previous year), overhead charges amounted to 28.6 (10.3) million marks, and after a depreciation of 60.9 (20.5) million marks, the net profit is 37.9 (15.2) million marks. The capital of the company is 100 million marks and the reserve fund has been brought up to the same amount. Several other accounts which have figured largely in previous balance sheets have been written down to one mark. A dividend of 30 per cent is being paid.

Mark Exchange the Governing Factor

BERLIN, GERMANY, Aug. 23.—The market continues to be entirely governed by the mark exchange collapse. Prices are ever higher, the demand and the shortage ever greater, and the unwillingness of producers to commit themselves to long contracts ever stronger. The price-rises of the Eisenwirtschaftsbund for pig iron from Aug. 21, and of the Steel Syndicate for its semi-finished and rolled mill products from Aug. 19 have been briefly reported by cable. The following report has merely a historical interest, as prices are now being changed at weekly or ten days' intervals. The prices are in marks per metric ton:

	Aug. 21	Aug. 9	July, 1914
Hematite	16,548	11,317	79½
Foundry iron I	13,637	10,481	75½
Foundry iron III	13,567	10,411	70½
Siegerland steel-iron	12,472	10,649	79
Spiegeleisen	13,561	11,823	75

These increases in no way injure Germany's ability to compete. They are far more than equalized by the exchange drop. The Eisenwirtschaftsbund has, however, provided for supplements to the basic prices according to future exchange movements and to possible new increases in coal prices and railroad rates. Railroad rates will be increased 50 per cent on Sept. 1; but by then a new increase of the above basic prices is almost inevitable.

To the latest prices of the Steel Syndicate a considerable addition is also inevitable. On Aug. 15 a governmental proposal to reimpose legal maximum prices on the Steel Syndicate's products was defeated by a large majority. Only labor's representatives, and not all of these, supported the proposal. Present prices are:

	Aug. 19	Aug. 8	July, 1914
Ingots	17,800	15,670	82½
Blooms	19,560	17,140	87½
Billets	20,280	17,770	95
Slabs	20,800	18,320	97½
Construction forms	23,700	20,776	110
Bars	24,050	21,070	97–99
Wire rods	25,000	22,700	117½
Thick plates	27,000	23,660	105
Medium plates	30,680	26,880	110
Thin plates	32,980	28,900	125
Thin plates, under 1 mm.	34,620	30,330	...

The Steel Syndicate's mark prices have of late risen considerably more rapidly than the prices of most other products, and the complaints of manufacturing consumers continue. The producers reply that they are using increased quantities of British coal, which at the present low mark exchange costs three or four times as much as German.

Qualifications of Fixed Price Contracts

Business is extraordinarily active. Western chambers of commerce report that 50 per cent more pig-iron and rolling-mill goods could be sold than is produced. The obstacle continues to be coal and labor shortage. The market for small iron goods and for fine steel articles is sharing in the industrial boom. The centers of these branches, Hagen, Solingen, Remscheid and Velbert, all report having abundance of orders; but working capital is short and the demand for advance payment of one-fourth to one-half of the contract price is the rule. Such contracts as contain fixed prices are qualified with the note "Freibleibend," which means that the producer may refuse to deliver at the agreed-on price if (as with present exchange conditions is inevitable) production cost continues to rise. A great stir has been made by recent decisions of the Leipzig

Court of Appeal freeing manufacturers from their fixed-price contracts on no other ground than that between the contract date and the date of delivery production cost underwent such a rise that contract fulfillment would have caused the seller a heavy loss.

Cutlery Exports

Solingen steel exports exceed the best pre-war periods. It is a fact, however, that exports to America rose abnormally in anticipation of the tariff legislation; and here a heavy decline is expected owing to saturation of the American market. The Solingen industry has always been predominantly an export branch. When its production of arms, other than luxury weapons, was stopped by the Versailles treaty, it largely went over to manufacture of bicycle parts, hair-cutting machines and tools, though the chief production is still in good-class cutlery.

Exports of Solingen goods classed as fine cutlery averaged annually in 1907-13 4500 metric tons, of the value 28,000,000 gold marks. Exports in 1920 were 4517 tons, valued at 632,000,000 paper marks. Solingen has almost entirely lost its French market. At present rates and present exchange, the hourly wage in the Solingen industry is under 3 American cents. This means extraordinarily low production costs.

FRENCH MARKET STRONG

Deliveries Becoming Extended—Foreign Competition Successfully Met

(*Special Correspondence*)

PARIS, FRANCE, Aug. 31.—The trade is now in a satisfactory situation, and producers, whose capacity of production is still somewhat restricted, have enough orders on hand to uphold prices. In the northern district, where no blast-furnace has been in operation since the war, because local works preferred to purchase semi-finished products from Lorraine, companies such as Denain et Anzin, Nord et Est, Firminy, etc., are contemplating the reconstruction of their blast furnaces.

Iron Ore.—Present prices of French iron ore at mines are:

	Francs
Briey	15
Thionville	11
Longwy-Nancy	10 to 13
Pyrénées	30

Pig Iron.—Chill-cast foundry pig iron No. 3 P. L. is maintaining its newly acquired firmness. The present average price is 210 to 215 fr. The producers of hematite iron, freed from the control of the Comptoir des Fontes Hématites, have to build up a clientele of their own and are, of course, feeling their way. Very low prices are being quoted. The price of 270 fr. at producing works noted in last week's market was offered by the Société de Paris et d'Outreau and by the Société des Aciéries de France, the latter selling from an old stock. As low as 250 fr. has been proposed by a company in the center of France, which is outside the area of British competition.

Semi-Finished Steel.—Inland orders are satisfactory and prices are firmer. Quotations are as follows for basic steel: Blooms, 320 to 325 fr.; billets, 340 to 345 fr. From 20 to 25 fr. more is charged for open-hearth material. Delivery is from six to ten weeks. Exports of semi-finished products to Great Britain are reported.

Beams and Rails.—It is believed that orders for beams and rails received in August by the Comptoir Sidérurgique (which controls the inland sales of these products) will make a record for this year. Some beams have been sold at 385 to 390 fr. (Belgian currency) f.o.b. Antwerp.

Sheets.—The market on sheets is very firm. Delivery is now about six weeks for heavy and medium sheets and three months for light sheets. British competition is practically non-existent. Belgian sheets could still be sold in the northeast of France; but the Comptoir des Tôles is making special delivered prices which fully meet that competition. French producers are now able to cover fully all national requirements.

Rolled Merchant Products.—It seems that the question of price is subordinated to the question of delays of delivery. For instance, some works which agreed to deliver within six or eight weeks have obtained prices up to 450 to 480 fr.; while the average price quoted by Lorraine works is only 435 to 455 fr., but with protracted delays in delivery: four or five months for medium specifications and six months and more for small iron bars and flats under 7 mm.

On open-hearth steel merchant products there is a good export demand and orders were recently awarded by the Lorraine and P. L. & M. railroads. The prices now accepted by Lorraine works are: 420 to 440 fr. for large shapes and 440 to 460 fr. for other shapes.

Castings.—Improvement in castings continues. Foundries are well occupied with orders and deliveries are becoming more extended.

American Versus British Rails

Considerable controversy has arisen, according to the *Engineer*, London, over a contract for steel rails for the Glasgow Corporation tramways. The lowest tender, amounting to £15,325, came from an American firm, the lowest British offer being £18,262. The former was recommended for acceptance but, after discussion before the Tramways Committee, it was agreed to refer the recommendation back in order to inquire into the American conditions of labor. Labor members contend that American steel workers are obliged to work 12 hr. a day and are not allowed trade union rights, whereas in Britain the workers have an 8-hr. day and recognition of their unions. Laborists therefore assert that the "fair wage" clause in Corporation contracts is not observed by American producers.

As announced by the cable message on page 566, Aug. 31, the contract was eventually awarded to the United States Steel Products Co.

Fall Meeting of New York Steel Treaters

The first fall meeting of the New York chapter of the American Society for Steel Treating will be held Wednesday evening, Sept. 20, in the assembly room of the Merchants Association of New York, Woolworth Building. G. C. McCormick, metallurgist, Crompton & Knowles Loom Works, Worcester, Mass., will read a paper, "Furnace Atmospheres and Their Relation to the Formation of Scale." An illustrated paper on "Duralumin" will also be presented by H. C. Knerr, metallurgist Naval Aircraft Factory, Philadelphia. Both of these papers are part of the regular program for the annual convention in Detroit, Oct. 2 to 7, and the first one was published in the society, *Transactions* for August.

Sheet Bars Sold at $40 at Youngstown

YOUNGSTOWN, Sept. 12.—A Valley producer of semi-finished steel has sold upward of 9000 tons of sheet bars for September delivery at $40. Another interest has taken a substantial tonnage of black sheets for next quarter delivery at 3.50c. Several companies are endeavoring to establish a higher differential than 1c. on galvanized grades, owing to higher labor charges and spelter costs.

For the fourth quarter, the steel bar market is stabilizing at 2.15c. to 2.25c. One Valley interest is accepting plate tonnage on a basis of 2.25c. to 2.50c.

Coal prices are softening. Coking coal is now obtainable at $5 for run-of-mine material, at the mine. Merchant coke price averages around $12 per ton.

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ESTABLISHED 1855

THE IRON AGE

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Steel Prices and Wages

Labor leaders recently have been boasting their success in keeping up war-time wages in employments in which militant unionism is strongest. Mr. Gompers has declared that "it is safe to say that the full volume of wage reductions, if spread over the working population and averaged up, would amount to less than 5 per cent. * * * This is a stark defeat for employers. It is a magnificent victory for the workers." He does not stop to inquire what sort of a victory it is that causes costs to rise and to that extent reduces the purchasing power of the pay-envelope for workers in industries apart from coal mining, transportation and building. That wages have not been reduced in harmony with the reduction of the cost of living is well attested by recent statistics. But Mr. Gompers evidently did not see what wreckage his boast of only a 5 per cent wage reduction—if it were true, as it is not—makes of all the claims of railroad workers and others that wages must be kept up to meet the rising cost of living.

The latest comprehensive information on the movement of living costs in the United States, as reported by the National Industrial Conference Board, shows that the increase in the cost of living, from the beginning of the war to July, 1922, was 55.6 per cent. The increase in the average wage paid by the steel companies is nearly 80 per cent, comparing 1915 with the rates to-day. These facts show one reason for the increase in the cost of manufacturing steel and prove that the purchasing power of the steel worker's dollar is now much greater than it was in 1915 and immediately before.

Although at the recent rehearings before the Railroad Labor Board in regard to wages of maintenance of way employees, some arguments were submitted to the effect that wage payments by the steel companies in the past year had not been so liberal as those of the railroads, a large buyer of steel sees clearly the present situation. Samuel M. Vauclain, president of the Baldwin Locomotive Works, who recently completed a 10,000-mile trip throughout the country, has given the results of his observation in an article in *Collier's* of Sept. 9. As to prices of steel, Mr. Vauclain says:

> Of more consequence to the country than the strikes and the passing disorders is the price of steel. This is preeminently a steel country. Steel is the basic industry of the nation, and when that great industry operates at a loss, the whole country suffers. A great many things have happened to increase the cost of production of steel—the high railroad rates, the high wages, the high coal prices, the lowering of the number of working hours. The most important factors in raising the cost of production have been the railroad rates and the price of high volatile coal. In the face of these increasing costs, the steel makers, in order to get business and keep their organizations together, lowered prices until now many of them are producing below cost. They thought that they would have to do this for only a little while, but the period has been longer than they looked for, and the steel trade is not prosperous.

Thus a broadminded man who has been in close touch with both railroads and steel plants for many years sees what some labor leaders and some railroad men and attorneys who attended the recent rehearing at Washington were unable to comprehend. Prices of some steel companies have risen so rapidly of late that Mr. Vauclain's statement, which doubtless was written a number of weeks ago, should be somewhat modified to-day. While steel manufacturers are not selling below cost to the extent that was true six months ago, the fact remains that the steel business is not on the sound basis of prosperity that it would be if both costs and selling prices were reduced. It is unfortunate that at a time when deflation was needed, a reinflation movement set in as the result of the "victory" of the coal miners over the farmers, the steel workers and employees in every industry that has had to share in the painful readjustments of the past two years.

The feature of the most significance in the world's electrical production in 1921 is the part played by the electric furnace in the steel foundry. In three countries, the United States, Great Britain and Canada, which had a total electric steel production in 1921 of 213,400 tons, 54.3 per cent or 115,700 tons was steel castings. This represents a large percentage gain in only two years,

the electric steel output of the same three countries in 1919 having been 476,900 tons, of which 31.1 per cent was castings. Viewed as a whole the electric steel industry suffered only a temporary set-back in the world-wide depression of 1921. The decline from 1920 is by no means as sharp as the decline for all countries in pig iron and total steel.

Greater Adaptability of Business

Much assurance as to the success of business in the United States in the next few years is furnished by the adaptability that was exhibited during the war and since, and even now is being shown. In steel the trade has managed to function despite price fluctuations that before the war would have been destructive of all stability and indeed productive of chaos. Steel prices nowadays move in a way that would have been considered violent before the war. Three of the ten years before the war showed a difference of 30 cents between the high and low price of nails, and one showed a difference of only 5 cents, while the average divergence, between the high and low points of each year, was only 21 cents. In merchant steel bars the years having great price swings showed differences of $7 a ton and the average difference was only about $4 a ton. Nowadays a single market change of 20 cents a keg in nails is not regarded as formidable. In bars an advance or decline of $5 a ton is not considered much, while at a given moment there may be a difference of $5 a ton or more between the cost of deliveries that are not very widely separated.

The great upward movement in steel prices in 1909 carried the average of all rolled steel products over a range of scarcely more than $5 a ton, while the average advance in 1912 was less than $7 a ton. Yet these were distinctly "major" price movements. Towards the close of each movement warnings were being sounded that should the mills advance prices any more they would destroy their demand.

The difference between conditions then and conditions of late is not that the dollar is inflated, so that a movement in dollars means less; for if the dollar is inflated the inflation cannot be claimed to be more than 50 per cent, and 50 per cent added to pre-war price fluctuations would not produce figures comparable with the fluctuations that are now common.

In all the history of American railroading before the war there was only one serious freight congestion—that which extended approximately from October, 1902, to March, 1903. In its time it was regarded as a calamity. The railroads were humble in their apologies, arguing that this was the first and possibly it would be the last. Since late in 1916 we have had several periods of traffic congestion and we are now faced with prospects of another.

Strikes before the war were numerous, but they were not so serious as those we have had since. They caused loss to the strikers and to their employers, but they did not injure the public as have recent strikes, nor did they interfere with the conduct of general business in any way at all comparable with the troubles business has had thrust upon it in the past three years.

If these disturbances, these handicaps to the orderly conduct of business, had been threatened before the war the menace would have been considered exceedingly serious. With the greater adaptability business has acquired they are simply regarded as obstacles to be overcome. They do not produce chaos or cause business to stop.

In gaging the future of business in the light of the "troubles" we have had and are likely still to have, a new and longer unit of measuring has to be used. It requires much more than formerly to make an impression on business, which has grown more alert and more able to bear trouble.

Economics and Psychology

Since the armistice all thinking men have directed their attention more than formerly to economics. Possibly we are still "a nation of economic illiterates" as we were dubbed about six years ago, but striking an average of all the people we are not altogether so illiterate as we were, and it may be suggested also that some foreign countries have not exhibited as much economic sense as might have been attributed to them.

Some individuals, possibly many, seem to have a feeling that this new interest in economics is more or less peculiar to them. They are not altogether certain that they have not acquired a sort of hobby, which they must be careful not to ride too hard or at least to exhibit too freely. These men should feel reassured. The interest in economics is general. It is no fad. The interest is the natural development of circumstances. There has been a great change in conditions and economic laws are working out results. Before the war the working was slow and almost invisible. Men could adapt themselves to such gradual changes as occurred without giving much thought to the underlying causes.

We are taking more interest in economics, as we ought to do and indeed must do, and no doubt we are making progress. But in connection with our increased study of economics a note of warning needs to be sounded. That is, that the aspect of psychology that involves considering what is in other men's minds must not be neglected.

In not a little of the current talk on economic subjects is an insistence that other men ought to obey economic laws that the speaker undertakes to lay down. Impatience is exhibited that some men are conducting themselves as they are. They are flying in the face of Providence, so to speak, in flouting these newly recognized economic laws, and punishment is on the way.

It may be, however, that these supposedly ignorant people know more about economics than appears. They may have motives of their own. They may have moderately good reasons to hope that they will escape direct punishment. Economic laws work out certain results, but never has it been shown that they punish each individual in the precise measure of his failure to

square his conduct with the general economic good.

It is found, for instance, that it would be for the general economic good for bricklayers to lay 1000 bricks a day instead of 500. It does not follow that the individual bricklayer deserves punishment. Study shows that a machine may be operated with seven motions when the operative takes ten. He may have reason for preferring the ten, particularly if he need not select the same ten each time. There are too many coal miners but it does not follow that it is the duty of any particular individuals to get out.

Further Advance in Centrifugal Castings

There are new evidences of progress in the centrifugal casting of metals. In THE IRON AGE of Aug. 31 an article described the production in a Scottish plant of a class of iron castings by this process which are apparently not made anywhere else. Piston ring sleeves, engine cylinder liners, even chilled wheels and rolls, are being cast, having properties quite different from those of sand-cast products. It is evident that there are large possibilities in the application of the centrifugal process to small castings of suitable section, besides straight pipe as in the De Lavaud process.

Attention is called to the author's comment on the centrifugal production of nickel-chromium chilled iron car wheels. The advantage of alloy iron car wheels, sand cast, was brought out at the June convention of the American Society for Testing Materials in 1921. Doubtless unusual properties would be secured by the centrifugal casting of wheels of this composition, due to the difference in structure, for one thing. This may be ultimately one solution of the chilled iron wheel problem in the United States.

Of equal interest and importance, in another field, is an article on another page describing the casting in a centrifugal machine of a high-carbon chromium steel, probably the first account of the successful production of an alloy steel casting by the centrifugal process. The chief feature is the attainment directly of a structure which only the most careful and time-consuming forging or rolling, with subsequent heat treatment, can develop in the same kind of alloy steel cast as an ingot. The centrifugally cast chromium steel, unworked and heat treated, is at least equal in structure and properties to similar metal treated by present methods. To this is added the possibility of producing an alloy with higher carbon and chromium than can be secured in ordinary working by present methods.

American engineers will learn with surprise that the London Electric Railways Co. is about to have five experimental all-steel cars built by as many different car-building concerns. Especially will this surprise be manifested in such cities as New York, Boston and Philadelphia, where the underground service has been performed for years by steel cars. So great has the superiority of the steel car been found, especially in its resistance to buckling in a collision and in its relative immunity from fire, that no other type now is permitted in trains underground in American cities. Some wooden or partly wooden vehicles still persist among the smaller cars, operated singly, as in the dense population area of Boston, but even on elevated structures the tendency is to get away from such construction as rapidly as possible.

CORRESPONDENCE

Further Federal Legislation to Control Industrial Relations

To the Editor: Apropos of your editorial, "The Railroad Injunction," may I submit some suggestions for Federal legislation to decentralize and control organizations of capital and labor. The leading motives of such legislation should be:

1. The recognition of the fact that co-operative effort, both by owners of capital and by workmen, is a legitimate outgrowth of a normally developing modern civilization.

2. For the common good, methods of safeguarding the public against the arbitrary and selfish use of the power gained by co-operation must be devised.

Public opinion already has rendered an adverse verdict against unrestrained combinations of capital. The present methods of restraint, such as the Sherman and Clayton acts, etc., should be carefully examined and revised along the line suggested above in (1).

Public opinion also has rendered a favorable verdict on the abstract question of the right of workmen to organize for common defense, etc. The arbitrary and selfish use of the power of association by workmen is also a menace to the public welfare. This has been strikingly illustrated by the action of some of the railroad unions and the United Mine Workers of America. Some practical methods must be adopted, therefore, to prevent the abuse of power by labor organizations.

The law encourages the association of men with capital in the form of corporations. It should also, by definite legislation, encourage the organization of the employees of a corporation into a "company union," which should be incorporated and thus made responsible for its acts.

The suspension, discharge, or other discrimination against an employee because of his relation to an association of fellow workmen should be prohibited under proper penalties.

The law aims to prevent two or more corporations from effecting combinations so powerful as to menace the common welfare. The law should also prevent like powerful combinations of the employees of two or more corporations, which would also menace the common welfare.

Certain industries, such as railroad companies, coal mining companies, and public utility companies, should be declared to be vested with a public interest.

For the purpose of adjudicating disputes between corporations vested with a public interest and incorporated company unions, there should be established one or more Federal industrial commissions. These commissions should have the usual powers of a court to call for witnesses, papers, etc., and after hearing both parties should render a decision as to the merits of the controversy.

This decision, however, *should be purely advisory and should not be legally binding on either party;* the idea being that such decisions will merely serve as an impartial guide in the formation of public opinion, which must be depended upon to bring sufficient pressure to bear upon the party refusing to accept the decision of the commission.

No incorporated company union of employees of public interest corporations should engage in a strike, nor should any such corporation lock out its employees,

until the questions at issue shall have been submitted to a properly constituted Federal tribunal. Proper penalties should be provided to be enforced against the individual at fault. PUBLIC INTEREST.

Suggestions to American Buyers of British Coal

To the Editor: It is estimated that nearly one and a half million tons of British coal has been purchased for importation to the United States, of which slightly more than one-third has reached its destination. Thus, only recently actual results as to its burning and heat-giving qualities have been ascertained, and already there is much complaint regarding the unsuitability as well as the poor quality of some of these coals. I have made inquiry as to the grounds of such complaints, because ordinarily a well chosen British coal should give in most cases almost the same satisfaction as a well chosen American coal.

On investigation among various consumers, including railroads, public utilities and industrial companies, I was more than surprised to find that, while the purchases have been made on analyses, no particular attention was given to other considerations which are highly important. No coal producing country in the world possesses such a variety of coals as Great Britain. There are the Welsh district, Scottish district, the Newcastle district, Yorkshire, Lancashire, Monmouthshire and other smaller districts; and it has not been appreciated in some cases that these districts have coals of differing qualities, ranging from high volatile by-product to low volatile steam coals.

A good many purchases have been made stipulating Welsh steam, or Monmouthshire steam, or Newcastle steam, with a certain percentage of volatile and sulphur, on the supposition that such coal should be equal to American coals of similar analyses coming under the classification of pools, these pools more or less clearly defining the general qualities of the coal. This is not the case.

Furthermore, a good many of these purchases have been made on the basis of two-thirds screened and one-third small, with the idea, I presume, of equaling coal that on this side would come under the category of run of mine. To my mind a great mistake has been made in purchasing such a mixture, as the majority of Continental railroads, public utilities and industrial companies, when purchasing coal from Great Britain, will only accept screened coal. The British coals, constituted as they are and worked in many cases in thin seamed mines, require the screening to improve the quality, and it has been customary for decades back to screen all coals with the exception of the high volatile. In fact, up to 25 years ago, the small coals were heaped at the pit's head because no use was found for them. Only with the introduction of special ratings and other mechanical improvements did these small coals become a marketable article. Therefore, by purchasing two-thirds large (otherwise screened) and one-third small, you get a poorer coal and yet have to pay for the cost of the screening.

My main purpose in writing is to suggest to purchasers of British coals not only to be careful that they do not purchase coals designated merely as from a given district but that they insist on coal from certain named collieries; furthermore, to insist that shipments be accompanied with colliery certificates duly attested by an American consul. British coal shipped to foreign countries has long been purchased on colliery certificates, which stand both for quality and quantity.

The average consumer in this country is at a disadvantage in not knowing which of the British collieries produce the quality suitable for his purpose. But a letter to any of the chambers of commerce in the respective coal districts, stating the writer's requirements and what he has been accustomed to use, would bring forth full information as to the best quality of coal to purchase. If consumers here continue to purchase by specifying simply steam or gas coal from a certain district, they are bound to have difficulties and in many cases find their coal unsuitable for their equipment. Those who do the stoking may have the best intentions, but will not be able to get satisfaction out of the coal. I know of cases in which the users of imported coal were actually unable to raise steam with it. While of the same volatile content as the American coals to which the buyer had been accustomed, they required entirely different handling under the boiler.

There is an impression that with the reopening of the mines in this country there will be no longer a necessity for purchasing British coal. I hold a different viewpoint. Although the productive capacity of the American mines may be even larger than the increased demand caused by the shortage owing to the strike, I am confident that the railroads will not be able to carry sufficient quantities to cope with such an extreme pressure as is caused by the shortage, owing to the long duration of the strike. Consequently within a month or so, especially with the approaching winter months, the pinch will be felt again and of necessity further large purchases will have to be made, principally as to hard coal. And although Great Britain would not be able to spare any consequential quantities of anthracite, yet there are certain dry coals, or so-called bastard anthracites, which will be a better substitute than the higher volatile coals.

The main mischief has been done so far by having bought coals somewhat indiscriminately merely on volatiles, without considering how the coal burns and how it requires to be stoked. The whole position can be improved by applying proper methods of handling the coal under a boiler according to the actual quality, in which case it will be necessary not only to know from what district the coal comes but also from what colliery in the district the coal was drawn.

Where it has been ascertained that the coal is absolutely unsuitable, it might be possible to arrange with consumers who could utilize such coals, as there are many consumers who are in the same dilemma. Some of them require just the coal the other has and yet cannot use, or if he is able to use it, is not able to get the fullest satisfaction out of it. Consumers should avoid the purchase of mixed cargoes of certain analyses, under which category the merchant would be left to consider his profits rather than the more important point whether the coals will be suitable or not. It is a mistake to consider dollars per ton as the most important factor, since a saving of 25c. a ton on the purchase might easily mean the losing of $2 or more a ton in results achieved.

To say that it would be difficult to exercise such careful discrimination would be far-fetched, as large buyers like the Swedish State Railway or other Continental lines will buy British coals by the millions of tons, as will gas works and industrial companies. They will all tell you they have bought British coals for decades by collieries and never by districts; have bought screened coals and never thought of purchasing a mixture of two-thirds large and one-third small.

R. C. MARTENS.

New York, Sept. 8.

The New Fiat Electric Furnaces

To the Editor:—In the article which appeared in THE IRON AGE, July 20, p. 151, "New Fiat Electric Furnace," it is stated that the Fiat should produce 1000 tons a month of steel ingots. This should be corrected, as the production was 1000 tons a month of steel castings for automobile and truck parts, which the Fiat produced in extraordinary numbers during the war for the Italian army and also the allies. The electric foundry for steel castings was of the greatest assistance in developing the campaign.

In another place the article mentions "carbon" electrodes. As the readers must have already understood by a consumption so small as 2.85 kg. per ton of steel, this did not refer to carbon electrodes, but American graphite electrodes.

DR. ALFRED STROMBOLI

Turin, Italy, Aug. 8.

ENGINEERS AND 8-HOUR SHIFT

Action at Boston on Reports Dealing with Continuous Industries

BOSTON, Sept. 9.—The Executive Board, American Engineering Council of the Federated American Engineering Societies, held a two-day meeting Sept. 8 and 9, at Hotel Bellevue, this city. The most important matter under consideration was the acceptance of two reports, one prepared by Horace B. Drury, industrial investigator and formerly of the faculty of Ohio State University, and the other prepared by Bradley Stoughton, consulting engineer, New York, formerly secretary American Institute of Mining and Metallurgical Engineers. These reports deal with the two-shift day and the three-shift day in continuous industries, and are based on two lines of inquiry extending over a period of nearly two years. The one directed by Mr. Stoughton embraces the iron and steel industry. While much of the report is favorable to the three-shift day, Mr. Stoughton raises some questions, including the following:

> If men are given 12 hours' pay for 8 hours' work, will they not still be discontented or dissatisfied and agitate for 12 hours' work at the advanced rate? There seems to be good reason to fear such a result. Further, do the men want the 8-hour shift? If this question really means, Do the men want the 8-hour shift with 8 hours' pay at the present hourly rate? then I believe there can be no question that they do not. The present daily wage of $3.60, which is for 12 hours' work at 30c per hour, is as low as even "common labor" can live on in America and support a family.
>
> The first question can be answered; the second one means that the "common labor" must be paid the same daily wage as at present, and some technical or commercial compensation found in the conduct of the operations, if possible. If it is not possible, and if profits at present cannot stand the extra production cost, then the 12-hour shift must be continued until a change occurs.

The investigations were made possible, under the direction of the council's committee on work periods, of which H. E. Howe, Washington, is chairman, by financial co-operation from the Cabot Fund, Boston. Presentation of the original reports was made to the council at Pittsburgh in May, at which time they were referred to a committee for editorial changes.

The question of accepting the reports developed rather vigorous opposition from a small minority of the council. Both reports subsequently were accepted and authorized to be published, with a few editorial corrections. The opposition took the stand that the American Engineering Council of the Federated American Engineering Societies should not accept the responsibility of these reports, which are sure to have a far reaching influence. It was argued that adverse criticism of the council would be invited, which might lead to unpleasant notoriety. It was brought out during the discussion that a group of ministers some time ago issued a report on working conditions in steel mills, which is the laughing stock of engineers the country over. It was intimated that this latter report might indirectly influence the public attitude toward the reports under consideration. It also was suggested that the two reports are not of an engineering nature, but more along social reform lines.

J. Parke Channing, New York, a member of the committee on work periods, as well as other members of the council, vigorously supported the reports. They stated that the nature of the data collected during the investigations is such that it cannot be set down in decimals and figures, which the opposition contended should constitute a basis for an engineering report. It was urged that the study ran into human as well as engineering problems, and that human problems cannot be tabulated.

As to the council's responsibility for the publication of the reports, it was contended that they recommended nothing, holding strictly to the findings of the investigators. Also that every man serving on the committee on work periods is an engineer, competent of judging the merits of the reports. In addition, the constitution and by-laws of the American Engineering Council of the Federated American Engineering Societies justifies that organization's sponsorship of the reports under question. Mortimer E. Cooley, president of the federation, as well as dean of engineering schools, University of Michigan, who presided at the session, during the discussion of acceptance turned the chair over to Calvert Townley, New York, in order that he might support acceptance. [Summaries of the reports appear on other pages.—EDITOR.]

Dean Cooley made the announcement, following the meeting, that he was about to start on a nationwide tour to arouse the engineering organizations of the leading industrial centers to greater zeal in the public service. A chief purpose of Dean Cooley's mission will be to familiarize American engineers with the findings of the council's committee on work periods. "The 12-hour day in continuous industry must go," said Dean Cooley. "A nationwide survey has shown conclusively that three shifts of eight hours each is desirable both for capital and labor. The eight-hour day makes for more harmonious labor relations, tends to safeguard management, and unquestionably brings about more contented workers and happier homes. Millions of men, women and children will profit when all continuous industries abolish the 12-hour shift."

PRODUCTION INCREASING

Improvement in Blast Furnace and Mill Operations in Mahoning Valley

YOUNGSTOWN, Sept. 12.—Iron and steel production is expanding in the Youngstown district, as coal shipments reaching the Valleys increase in volume. Improvement is reflected in both blast furnace and rolling mill operations. With the blowing in of the 600-ton stack of the Trumbull-Cliffs Furnace Co. at Warren, scheduled for resumption Sept. 13, 21 of 47 furnaces in the Mahoning and Shenango Valleys will be pouring. Mattie blast furnace at Girard of the A. M. Byers Co., Pittsburgh, will also be blown in at an early date.

Pig iron production is therefore approaching 50 per cent, as compared with an average of less than 30 per cent in August. Most of the hot metal being produced is used in steel making, comparatively little being sold in the merchant market.

Iron and steel makers show considerable optimism over fourth quarter business and production, one interest predicting a 70 per cent average for the final quarter of 1922.

Fifty-nine of 66 open-hearth furnaces in the Mahoning Valley are melting; independent operations in the Valley are estimated at 70 per cent. Three of four Bessemer plants are active, while 104 of 113 sheet mills were scheduled at the beginning of the week.

Production of merchant iron is being retarded by the scarcity and high cost of coke. In the Shenango Valley one merchant furnace is in blast, but the output is absorbed as hot metal by a producer of ingot molds and castings.

Sales executives reported undiminished demand for the lighter steel products.

Steel Works Electrical Engineers Meeting

CLEVELAND, Sept. 12.—The Association of Iron and Steel Electrical Engineers began its sixteenth annual convention in the Public Hall in this city yesterday with a registration of over 1100 for the first two days. Monday was devoted to a business meeting and reports of committees. Starting to-day technical sessions will be held until Friday noon. The annual banquet takes place Thursday evening and inspection trips will be made to Cleveland plants on Friday afternoon. A large exhibit of electrical equipment is being shown in connection with the convention.

The Norwalk Iron Works Co., South Norwalk, Conn., a builder of compressors, has merged with the Automatic Carbonic Machine Co., Peoria, Ill., the plant and equipment of which is being moved to South Norwalk. Through this consolidation the company will be able to supply, in addition to its standard ammonia equipment, a completely developed line of carbonic gas equipment for refrigeration and ice making.

METAL SCHEDULE CHANGES

House Recedes on Most Rates—Foreign Valuation Prevails—Zone Plan Abandoned

WASHINGTON, Sept. 12.—The metal schedule of the tariff bill as finally reported to-day from conference is left in the form in which it passed the Senate in all important respects. Almost invariably the House conferees receded, as was done with regard to the vast proportion of the rates and provisions throughout the bill.

The bill, which now is before the House, after which it will go to the Senate for final passage, retains the duty of 1c. per lb. on manganese ore and 1⅞c. per lb. on ferromanganese and continues the ferroalloy section in other respects as acted upon by the Senate. In the general steel section of raw and rolled products, the Senate rates also are carried with few exceptions of minor importance.

Alloy Steel Rates

One important change, however, made regarding alloy steel consists of a change in verbiage in paragraph 305, which provides that additional duties shall be applied to all alloy steels instead of only to those in paragraph 304 relating to ingots, blooms, billets, bars, etc. This change was made by inserting the word schedule instead of referring to the single paragraph.

On anti-friction balls and rollers, the conference retained the Senate specific duty of 10c. per lb. and adopted a House amendment carrying an additional duty of 45 per cent ad valorem instead of 55 per cent as proposed by the Senate. The House bill imposed a duty of 20 per cent American value on welded cylindrical furnaces and iron or steel tubes not specifically provided for, while the Senate bill provided 30 per cent foreign value. The House receded with an amendment making the duty 25 per cent foreign value. The House American value duty of 25 per cent on flexible metal tubing and rigid electrical conduit and the Senate foreign value duty of 35 per cent were changed to 30 per cent foreign value. Senate rates on chain were adopted except on chains less than ⅜ and not less than 5/16 in. in diameter, and less than 5/16 in., the House rates of 2½c. and 4c. per lb., respectively, being accepted. The conferees compromised on a duty of 35 per cent instead of the Senate duty of 40 per cent on the House duty of 30 per cent on spiral nut locks and lock washers. The House receded with an amendment restoring the classification on metallic magnesium and metal magnesium scrap, but making a duty of 40c. per lb. and 40c. plus 20 per cent on magnesium alloys, tubing, wire, etc.

Compromise on Magnesite

A compromise was reached on magnesite, the Senate rates being increased and House rates lowered. The duties finally determined upon are equivalent to $11.50 per net ton on dead burned and grain, or 23/40c. per lb.; $12.50 or ⅝c. per lb. on calcined, and $6.25 or 5/16c. per lb. on crude. The Senate rates on graphite were adopted except that the conference accepted a House amendment changing the rate on crystalline flake to 1½c. per lb. Senate rates on fluorspar were accepted. A number of compromises were made regarding cutlery, clocks and surgical instruments.

The House receded on the American valuation plan and accepted the Senate foreign valuation plan and the provisions for flexible tariff rates to be declared by the President under certain conditions. The Senate receded on its provision for the establishing of foreign trade zones.

EXPORT TRADE INACTIVE

Rail Orders Still Largest Item — Tonnage for Bolivia Bought—Chilean Railroads to Inquire

NEW YORK, Sept. 12.—Export trade to all markets, including Japan, is at an extremely low ebb. While business is still appearing from Japan, it is almost entirely from Governmental sources and the purchases are largely confined to rails. The black sheet business, which it was hoped would continue as large as it was last year, because of the municipal ordinances calling for fireproof roofs throughout the country and other uses, is at a minimum. This dullness in light gage sheets is partly explained by large stocks on hand, said by some to amount to as much as 80,000 tons and also by the fact that the Japanese are now purchasing British and Continental sheets, which are lower in price.

The recent tender of the Imperial Government Railways, which called for 4700 tons of 75-lb., 20-lb. and 16-lb. rails has been awarded to Suzuki & Co., New York, and the Government railroads have issued a new tender calling for 4000 tons of 60-lb. rails. Beside these official rail purchases, American export houses report that they are bidding on some small tonnages for private interests. One of these calls for about four miles of 25-lb. rails to be shipped c.i.f. Takao. The South Manchuria Railway Co., which, some time ago, received bids for furnishing about 700 tons of tie plates, has not yet awarded the contract to an exporter. Work on the hospital building for this railroad at Dairen, Manchuria, which it is estimated will cost about $1,500,000, will probably be started about Jan. 1. The contract was awarded to George A. Fuller of the Orient, New York. This company, which is working on several buildings in Tokio, Japan, generally purchases the major part of materials for construction work in the United States.

Tenders will be issued some time in October by the Chilean State Railways, 141 Broadway, New York, for furnishing locomotive tires, steel axles, plates and similar equipment. Request for bids on the annual rail requirement of the Chilean railroads will probably be made in December. The Ulen Contracting Co., 120 Broadway, New York, executing a contract with the Bolivian Government, which calls for the building of about 204 kilometres of railroad, has closed on the preliminary tonnage of rails for the work, amounting to about 60 per cent of the total amount needed. This tonnage of 8250 tons with accessories was placed with the United States Steel Products Co., which received 2250 tons, and with a Belgian mill, which will roll the remaining 6000 tons. Immediate delivery was given by the American seller, the rails being shipped to the north end of the road. The Belgian delivery was slightly extended but the price was lower. This is the extent of the rail purchases of the company for this year.

Between 12,000 and 13,000 tons of 60-lb. rails will be needed for completion of the railroad, but these will be purchased later. The Bolivian Government has announced that bids will be accepted on the construction of the remainder of the Potosi-Sucre Railroad, totaling about 60 miles, 40 miles of this road, from Potosi to Betanzos having been constructed under Government direction.

The most recent bids received on the project for electrification of the railroad from Durban to Pietermaritzburg, South Africa, will be opened in October. Bids for furnishing materials and performing the engineering work have been obtained and rejected several times during the past year. There have been some American bids submitted.

The Machinery Club of Chicago will hold its annual picnic at Thatcher's Woods, River Forest, Ill., Sept. 16.

Iron and Steel Markets

OUTPUT GROWING

Fifteen Blast Furnaces Resume in the Week—Steel Supply Easier

Railroads Pressing for Car Deliveries—Steel Works at 60 Per Cent

Blast furnace resumptions by steel companies are coming more rapidly than in the first week of September. Pittsburgh, Youngstown, Cleveland, Chicago and eastern Pennsylvania report 15 furnaces started in the past week, and indications are that all the August loss of 28 furnaces will be made up by another week or ten days.

Such an increase in pig iron production points to a correspondingly easier situation in the near future in respect to steel deliveries, subject to the handicap of insufficient car supply for the moving of certain rolling mill products.

The embargoes announced by various railroads in the past week have had no important effect as yet on steel shipments. Ample supplies of cars are still available for coal shipments and thus far the steel industry has not been directly affected by priority rulings.

One factor of uncertainty grows out of Washington proposals for co-operation by coal producers in furnishing tonnages for use as required to keep prices in check. Since steel makers are being pressed by railroads and car builders to supply steel for cars and locomotives they are making every effort to increase output.

In the past week special efforts have been made to expedite the delivery of railroad steel. With much equipment in bad order, the railroads are urging car works to make deliveries, since new equipment will operate for a considerable period without needing attention.

Locomotive works also are expediting deliveries on the unusual volume of business they have booked recently. Late orders include 75 locomotives for the New York Central and 50 for the St. Louis & San Francisco. A considerable item in the machine tool trade is a $500,000 list of shop equipment for the Missouri, Kansas & Texas.

The Steel Corporation ingot production this week is at more than 60 per cent of capacity and several independent companies are again close to 60 per cent, with prospects of some further increase.

August steel ingot output, as expected, fell off much less from the July rate than did pig iron—about 25 per cent for pig iron and only 11 per cent for steel. As against a 35,000,000-ton yearly rate in July, the August rate was nearly 31,000,000 tons, and to-day it is nearer 32,000,000 tons.

Buyers of steel are disposed to limit their purchases at present prices, which still show a considerable range, in view of the Steel Corporation's evident purpose to continue its conservative policy.

An important mill in the Chicago district has had in the past week the heaviest inquiry that has come to it in 18 months. However, agricultural buying in that market, which began on a moderate scale some weeks ago, has gradually fallen off as prices have advanced.

Eastern bar iron manufacturers have advanced their price $3 per ton, or to 2.25c., Pittsburgh. About 500 tons of Belgian steel bars have been brought in at Philadelphia for sale at about 1.90c., Pittsburgh.

Significant of an easing situation is the Ford Motor Co.'s release this week of a portion of the steel sheets it had held up at the mills when it published its plan to close down on Sept. 16.

Connellsville coke supply increases slowly, so that pig iron output at merchant furnaces can make only a gradual gain in production. The trend of pig iron prices at Pittsburgh is still upward, but in other sections the advance seems to be arrested and in eastern Pennsylvania a prominent steel company is selling foundry grades on a basis of $32, or $2 below the recent prevailing price. The leading Virginia interest, which expects to blow in a furnace in a few days, has announced a schedule based on $32 for No. 2 plain, but has made no sales. The Birmingham market seems to be settling to $25, although Southern basic has sold as high as $27.50. Deliveries from the South continue to be extremely slow.

The scrap market is in commotion. There is the cumulative effect of the abnormal use of old material at steel works since pig iron became so scarce, added to the scant offerings of railroad scrap during the strike, also the long curtailed production of scrap at many metal-working plants. In an excited market prices have advanced by $1 to $3 a ton in the past week.

Of 8250 tons of rails bought by Bolivia, Belgium will supply 6000 tons. The remainder for early shipment was placed in the United States. Somewhat later upward of 12,000 tons additional will be needed.

THE IRON AGE composite price for pig iron has advanced $1 to $31.52 per gross ton, the highest figure since the first week of 1921. Four weeks ago it was $26.77; one year ago it was $19.81 per ton.

Pittsburgh

Demand for Steel Still Exceeds Supply—Pig Iron Price Trend Upward

PITTSBURGH, Sept. 12.—Blast furnace resumptions in this and nearby districts have been so numerous lately as to give rise to hopes of an easier supply situation in steel in the near future. Practically all of the furnaces which have gone on—and the total for the western Pennsylvania, Wheeling and Valley districts since the settlement of the coal strike a little more than two weeks ago has been 18 with three more ready to start—have been steel works stacks. In another week, it is expected, the number of active will be close to the peak reached early in July of 76, out of a total of 139 furnaces.

So far, the increased production of iron has not caused any weakening in the steel situation. On the contrary, the demand, though showing less urgency in a number of lines, still exceeds the supply and because of that condition, prices can be based on costs,

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton	Sept. 12, 1922	Sept. 5, 1922	Aug. 15, 1922	Sept. 13, 1921
No. 2X, Philadelphia‡	$34.64	$36.14	$33.14	$20.84
No. 2, Valley furnace†	35.00	35.00	30.00	21.00
No. 2, Southern, Cin'ti†	29.05	29.05	24.05	23.50
No. 2, Birmingham, Ala†	25.00	25.00	19.50	19.00
No. 2 foundry, Chicago*	32.00	32.00	30.00	22.00
Basic, del'd, eastern Pa.	32.00	32.00	27.25	19.25
Basic, Valley furnace	**32.50**	30.00	26.00	19.00
Valley Bess., del. Pitts	34.77	34.77	28.76	21.96
Malleable, Chicago*	32.00	32.00	30.00	22.00
Malleable, Valley	33.00	33.00	28.00	20.00
Gray forge, Pittsburgh	**36.77**	34.77	30.00	21.96
L. S. charcoal, Chicago	36.15	36.15	33.15	33.50
Ferromanganese, seaboard	67.50	67.50	67.50	70.00

Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$40.00	$40.00	$40.00	$47.00
Bess. billets, Pittsburgh	**40.00**	38.00	35.00	29.00
O.-h. billets, Pittsburgh	**40.00**	38.00	35.00	29.00
O.-h. sheet bars, P'gh	40.00	40.00	35.00	30.00
Forging billets, base, P'gh	**45.00**	43.00	40.00	34.00
O.-h. billets, Phila	45.17	45.17	42.67	35.74
Wire rods, Pittsburgh	**47.50**	45.00	42.00	38.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	2.00	2.00	2.00	1.70
Light rails at mill	2.00	2.00	1.90	...

Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	**2.575**	2.42	2.325	1.95
Iron bars, Chicago	2.25	2.25	2.15	1.75
Steel bars, Pittsburgh	2.00	2.00	1.90	1.65
Steel bars, Chicago	2.10	2.10	1.90	1.85
Steel bars, New York	2.34	2.34	2.24	2.03
Tank plates, Pittsburgh	2.00	2.00	1.90	1.65
Tank plates, Chicago	2.30	2.30	1.90	1.75
Tank plates, New York	2.34	2.34	2.34	2.03
Beams, Pittsburgh	2.00	2.00	1.90	1.65
Beams, Chicago	2.20	2.20	1.90	1.80
Beams, New York	2.34	2.34	2.24	2.03
Steel hoops, Pittsburgh	2.75	2.75	2.50	2.15

Sheets, Nails and Wire,	Sept. 12, 1922	Sept. 5, 1922	Aug. 15, 1922	Sept. 13, 1921
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	3.35	3.35	3.15	2.75
Sheets, galv., No. 28, P'gh	4.35	4.35	4.15	3.75
Sheets, blue an'l'd, 9 & 10	2.50	2.50	2.40	2.20
Wire nails, Pittsburgh	2.60	2.60	2.40	2.90
Plain wire, Pittsburgh	2.35	2.35	2.25	2.60
Barbed wire, galv., P'gh	3.15	3.15	3.05	3.55
Tin plate, 100-lb. box, P'gh	$4.75	$4.75	$4.75	$5.25

Old Material, Per Gross Ton:				
Carwheels, Chicago	**$23.50**	$22.50	$20.50	$13.50
Carwheels, Philadelphia	**21.00**	20.00	17.50	17.00
Heavy steel scrap, P'gh	**19.50**	18.50	17.50	13.50
Heavy steel scrap, Phila	**16.00**	15.50	15.00	11.50
Heavy steel scrap, Ch'go	**18.50**	17.50	15.75	11.00
No. 1 cast, Pittsburgh	**21.50**	19.00	19.00	17.00
No. 1 cast, Philadelphia	**21.00**	19.00	19.00	17.00
No. 1 cast, Ch'go (net ton)	**22.00**	21.50	18.50	13.25
No. 1 RR. wrot, Phila	**21.00**	18.50	18.00	15.00
No. 1 RR. wrot, Ch'go (net)	**18.00**	17.50	14.50	11.50

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	**$11.00**	$10.00	$14.00	$3.25
Foundry coke, prompt	**12.50**	12.00	15.00	4.25

Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	14.12½	14.12½	14.12½	12.25
Electrolytic copper, refinery	13.75	13.75	13.75	12.00
Zinc, St. Louis	**6.37½**	6.25	6.15	4.20
Zinc, New York	**6.72½**	6.60	6.50	4.70
Lead, St. Louis	**5.60**	5.55	5.55	4.40
Lead, New York	**5.95**	5.90	5.90	4.60
Tin (Straits), New York	*32.12½*	32.50	32.12½	26.75
Antimony (Asiatic), N. Y.	**6.25**	5.37½	5.25	4.45

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.
The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price, Sept. 12, 1922, Finished Steel, 2.412c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel

Sept. 5, 1922,	2.412c.
Aug. 15, 1922,	2.255c.
Sept. 13, 1921,	2.279c.
10-year pre-war average,	1.689c.

Composite Price, Sept. 12, 1922, Pig Iron, $31.52 Per Gross Ton

Based on average basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

Sept. 5, 1922,	$30.52
Aug. 15, 1922,	26.77
Sept. 13, 1921,	19.81
10-year pre-war average,	15.72

which are not receding much, with labor scarce and not especially efficient and scrap prices advancing with much rapidity.

Pig iron prices still show an upward tendency and with coke so scarce as to prevent the blowing in of merchant furnaces, relief from the present scarcity is not believed to be immediately ahead. It is a question whether furnaces dependent upon Connellsville coke could find accommodation even if the prices of iron advanced sufficiently to permit the payment of present coke prices. The strike in that region still is far from being over.

The past week has seen further stiffening in semi-finished steel prices and this is generally considered to forecast further upward revisions of prices of finished products. The claim is set up that with sheet bars at $40, the base gage of black sheets should bring 4.25c. to net a fair profit. Some makers have advanced their prices to $5 to $7 a ton above the Steel Corporation bases. Premiums also are common on hot-rolled flats. An advance of $3 per ton has been made by all of the independent makers of wire products. In these several changes, the Steel Corporation has not yet followed and its price policy generally is a conservative one. Suggestions persist that tin plate must command more money to offset the higher producing costs.

Ample supplies of cars still are available for coal shipments and the steel industry as yet is unaffected by the priority regulations. The Connellsville region, however, on account of the curtailed production, is not demanding many cars and since union mines have not reached capacity operations, no real strain has been placed upon supplies, especially as there were available not only the railroad cars in storage, but those privately owned. Car shortages for fuel movements are looked for and makers of wire products and other steel products, which for sake of safety are moved in box cars, find it necessary to resort to the use of low-sided open top cars, because of the scarcity of box cars.

Blast furnace resumptions have caused a demand for coke that has sent the price up $1 a ton. Advances of 50c. to $3 are noted in scrap.

Pig Iron.—Although lacking in activity, the market has lost none of its recent strength and it is freely predicted that prices will go still higher before they take a turn in the other direction. It is believed that

production of the steel works furnaces which recently have gone on will be needed by the producers themselves, since reserves were quite generally exhausted while the furnaces were down and any surplus iron that is made will be put into reserves. Merchant furnaces probably could make iron profitably even at the current cost of $11 per net ton at ovens for beehive oven coke, but this does not mean that many such furnaces will go in immediately, because the strike in the Connellsville district is not yet over and the question of price is unimportant by comparison with lining up tonnages. Getting the men back to work is preliminary to getting coke supplies and when that can be accomplished is merely a guess. Little has been done here in the past week outside of a sale of 2000 tons of basic iron to an Allegheny Valley sheet maker at $32.50, Youngstown. This sale sets the market on basic at that figure. A Valley independent is negotiating a sale of 20,000 tons of basic. We quote foundry iron on the lower silicons at the same price as No. 2 grade for the reason that it is not available at less.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$32.50
Bessemer	33.00
Gray forge	35.00
No. 2 foundry	35.00
No. 3 foundry	35.00
Malleable	33.00

Ferroalloys.—Interest in the tonnage alloys is low, despite the increasing rate of steel works operations. Prices show little change. Spiegeleisen is $1 per ton lower at $38 furnace, for average 20 per cent material and $37 for 16 to 19 per cent, this being due to the fact that production is gaining owing to a better coke supply. British ferromanganese still is being offered for future delivery at $67.50, c.i.f. Eastern seaboard, but purchases are light since present indications are that the new tariff bill will be a law before shipments can be landed. There has been a rather good demand for ferrotungsten in this district lately, with several sales of foreign material at 45c. per lb. contained tungsten.

We quote 78 to 82 per cent ferromanganese, $75 c.i.f. Atlantic seaboard for domestic; British, spot, $70 to $72.50; British, future, $67.50; German, 76 to 80 per cent, $67.50 to $70. Average 20 per cent spiegeleisen, $38 furnace; 16 to 19 per cent, $37 furnace; 50 per cent ferrosilicon, domestic, $55 to $60 furnace, freight allowed. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, $50.50; 11 per cent, $53.80; 12 per cent, $57.10; 13 per cent, $61.10; 14 per cent, $64.10; silvery iron, 6 per cent, $39; 7 per cent, $40; 8 per cent, $41.50; 9 per cent, $43.50; 10 per cent, $45.50; 11 per cent, $48.80; 12 per cent, $52.10. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $3.66 per gross ton.

Tin Plate.—Demands of container manufacturers in connection with the pack of perishable foods have been pretty well satisfied and since current requirements are neither extensive nor pressing, the supply situation is comparatively easy. Costs, however, are much higher now than in the second quarter of the year and as they promise to remain rather high in the final quarter, prices are firm. On really large orders, slight concessions from the "official" quotation of $4.75 per base box, Pittsburgh, are being made, but instead of 15c. to 25c., this is now a matter of only 5c. to 10c. per box. Unless there is a drop in steel prices, or some other means of cutting costs, an "official" quotation of $5 per base box is likely by independents on first quarter, 1923 business. The leading interest is silent on the matter of future prices.

Cold-Finished Steel Bars and Shafting.—There has been no relief for most makers in this district in the matter of supplies of hot-rolled bars and while the demand for cold-finished bars is not of hugh proportions, it is sufficient to sustain the recent advance to 2.50c., base, Pittsburgh, for carload lots. The principal demand is from the automotive industry, makers of agricultural implements and machine tools still being negligible buying factors. Ground shafting is unchanged at 2.90c., base, f.o.b. mill for carloads.

Hot-Rolled Flats.—The market is at a minimum of 2.75c., but on orders calling for early delivery, 2.85c. to 3c. has been obtained and some makers will not consider narrow widths at less than 3c., and have quoted as high as 3.25c. Only small tonnages, however, are moving at the higher prices.

Cold-Rolled Strips.—With no easing in costs of hot-rolled material, there is no inclination on the part of makers of cold-rolled strips to consider less than 4.25c., base, Pittsburgh.

Nuts and Bolts.—The recent advance is well maintained and with the demand fairly active and no signs of an immediate easing in prices of raw material, it looks as though present prices soon would be minimums. Discounts are given on page 683.

Rivets.—Recent price advances do not seem to be affecting demand and the new prices daily are becoming more firmly established. With bars at 2c., base and rods at $47.50 per gross ton, it is claimed that present rivet prices are low enough. Prices and discounts are given on page 683.

Track Fastenings.—We make no change in prices this week. The market, however, is firm and there is a brisk demand for small spikes in connection with coal mine resumptions incident to the ending of the strike. Prices are given on page 683.

Billets, Sheet Bars and Slabs.—Producers still are hesitant about naming prices on fourth quarter tonnages because of the uncertainty as to costs. With blast furnace and steel works operation increasing, it is probable that costs will be less than they are at present, but this is not assured, since the coal strike is not over in the Connellsville district and transportation conditions now seem likely to interfere with plant operations. The market at present is entirely a spot affair and business is generally at sellers' valuations. Sales of several thousand tons of sheet bars recently have been made in the Youngstown district on a basis of $40 and that is as low as they can be had here. One local maker will take Bessemer sheet bars at $40, but does not want open-hearth bar business at that price. At the moment, Bessemer steel appears to be a little more plentiful than open hearth. Billets have sold at $40, Pittsburgh for 4-in. soft steel and there also have been sales at $42, mill, outside this district and of foreign steel at from $47 to $50, mill. The Steel Corporation is out of the market on all forms of semi-finished material.

We quote 4 x 4-in. soft Bessemer and open-hearth billets at $40; 2 x 2-in. billets, $40; Bessemer and open-hearth sheet bars, $40; slabs, $40; forging billets, ordinary carbons, $45 to $47, all f.o.b. Youngstown or Pittsburgh mills.

Iron and Steel Bars.—As a selling price, 1.90c., Pittsburgh, steel bars have disappeared even for indefinite delivery. The Steel Corporation has not yet succeeded in making headway against its obligations and can take little business for delivery as promptly as most buyers desire. Independents are quoting from 2c. up to 2.25c. for reasonably early delivery. The Carnegie Steel Co. priority scheduling of its mills still is in effect. Concrete bars rolled from billets are available at 2c. from independent mills. Iron bars are firm.

We quote steel bars rolled from billets at 2c. to 2.25c.; reinforcing bars, rolled from billets, 2c. to 2.25c. base; rail steel reinforcing bars, 1.90c. to 2c.; refined iron bars, 2.45c. in carloads, f.o.b. mill, Pittsburgh.

Steel Rails.—No trouble now is experienced by makers of light rails rolling them from new steel in getting 2c., base, and some business with coal companies has been done a trifle higher. As high as 2.25c., base, is quoted, but sales at that price are few and small.

Iron and Steel Pipe.—There has been no material letup in the demand for merchant pipe, notably in the butt welded sizes, but due to better operating conditions resulting from the improved fuel situation, some progress is being made toward reducing obligations. Oil country and line pipe business is rather slow, because supplies of oil above the ground still are excessive and so long as this condition exists, prices must remain low and drilling be restricted. A move to definitely limit new drilling is reported to be afoot, but so far has not found general adoption. Business in wrought iron pipe seems to have suffered as a result of the advance of a few weeks ago. Discounts are given on page 683.

We quote 25 to 45-lb. sections, rolled from new steel, 2c. to 2.25c. base; rolled from old rails, 1.90c. to 2c. base; standard rails, $40 per gross ton mill for Bessemer and open-hearth sections.

Steel Skelp.—The market is quotable from 2c. to 2.50c., but only the Steel Corporation customers are

getting accommodation at the lower figure and then only for limited tonnages and not for specified delivery. Independent makers are not quoting less than 2.25c. and claim ability to obtain 2.50c. for prompt tonnages of narrow grooved skelp.

Wire Products.—Late last week, independent producers announced new prices, which as compared with those previously in effect and to which the Steel Corporation subsidiary still is adhering in a nominal way, show advances of $3 per ton. This puts the independent market at $2.75, base, per keg, Pittsburgh for nails, $2.50, base, per 100 lb. Pittsburgh, for wire and $2.25 base, per count keg for coated nails. One independent company, however, is quoting the latter product at $2.35. A cut of 1½ points in the discount on woven wire fence has been made by most independents, but one has cut the discount only one point. To jobbers, the discount on this product now is 70½ per cent off list, as quoted by independents and 72 per cent off list, the latest price of the leading interest. Discount to retailers is 2½ points less. The new prices generally have not yet found much basis in sales, because most makers owed considerable tonnage at lower figures and distributors naturally are specifying against these orders instead of buying. There has been, however, a strong effort to get the mills to take on more business at the old prices. Shortage of box cars has forced two makers here to resort to the use of open top cars, with tarpaulin covering, and one is making acceptance of shipments in this fashion a condition of early delivery. Prices are given on page 683.

Wire Rods.—Sales of ordinary soft rods have been made here at $47.50 for prompt shipment and that now is as low as any can be had, although the Corporation continues to quote $43. The latter, however, is taking no business. No prices yet have been named on fourth quarter tonnages. Whether they will be at the basis of recent business or below depends largely on whether the upward slant of steel works operations is checked by transportation difficulties and labor shortages. Both factors are operative now, but the mills are figuring that cool weather will bring about a better supply of help.

We quote No. 5 common basic or Bessemer rods to domestic consumers, $47.50; chain rods, $47.50; screw stock rods, $52.50; rivet and bolt rods and other rods of that character, $47.50; high carbon rods, $54.50 to $57.50, depending on carbon, per gross ton, f.o.b. Pittsburgh or Youngstown.

Structural Material.—Deliveries on plain steel to fabricating companies still are laggard, but improvement is expected in this direction, since new demands are lighter and a better operation of blast furnaces and steel works should be helpful to production. Building costs, notably in labor, are rising rapidly and the development is causing the postponement of some projected work. Here, the contractors find it necessary to pay bonuses to get men so they can live up to their contracts. The men are seeking the bonus jobs and neglecting others. The prevailing market on structural shapes is 2c., but on small tonnages for early shipment, premiums up to $5 a ton are demanded. Prices are given on page 683.

Plates.—Demand is not very heavy in this district, but it looms big in comparison with production and supplies. The market is quotable from 2c. to 2.50c., Pittsburgh, but independents are not interested in less than 2.25c. Tank builders are not getting many new inquiries. Prices are given on page 683.

Boiler Tubes.—Iron boiler tubes appear to be priced too high to sell well, but a satisfactory business is reported in steel boiler tubes, notably in seamless tubes, in connection with recent big locomotive orders. Discounts are given on page 683.

Sheets.—With the sheet bar market strong and sales of several thousand tons reported at $40, Youngstown, there is a disposition on the part of independent makers to seek higher prices. Several already are quoting blue annealed at 2.75c., base, Pittsburgh, black at 3.75c., base, and galvanized at 4.75c. base or $5 to $7 a ton above the Corporation prices. With sheet bars at $40, it is claimed that still higher prices must prevail, since it is figured that the cost of making No. 28 gage black sheets would be more than 3.70c. The Corporation sheet-making subsidiary is holding at third quarter prices, but is not letting customers specify beyond their usual average requirements. This company is operating at 65 per cent of capacity this week, a gain of 5 per cent, chiefly in the tin plate mills, due to a better supply of Bessemer sheet bars. Independent companies still are running above 80 per cent, the average for August having been about 85 per cent. Prices are given on page 683.

Coal and Coke.—The market on furnace coke is no longer quotable at less than $11 per net ton at ovens. That price has been paid on the requirements for two months of one furnace which will soon be blown in and on other sales, the total of which is 30,000 tons. It is hard to figure a much lower price, since beehive oven production cannot increase much so long as the men in Connellsville district insist on union recognition as a condition of their return to work and once the production does rise it will be wanted by furnaces which will be going in. Not much by-product coke is available for open market sale, as steel works stacks require about all of the production. Foundry coke also is stronger, not now being available at less than $12.50 per net ton ovens. The coal market is rather soft, as supplies are now ample for all demands. Gas coal lately has been at $5.50 at mines, against $6 previously, while coking coal is right around $5 and steam grade at $4.50 for tipple coal and as low as $4 from wagon and stripping mines.

Old Material.—Prices on most grades have advanced sharply since a week ago, due to increased interest on the part of melters, which has emphasized the shortage in the available supply and encouraged dealers to make still higher appraisals on their yard holdings. Actual sales, however, have been made at advances of from 50c. to $3 or more a ton. Some sales of heavy melting steel were made last week at $19, but this week, bids of $19.50 by melters have found no takers. Our specialties, such as railroad knuckles, couplers, springs and angle bars, as much as $23 recently has been paid, while the market has advanced on sales $1 a ton on billet and bloom crops. As much as $17 has been paid for short shoveling turnings, which are in demand in connection with blast furnace resumption. Compressed sheets are rated higher in sympathy with heavy melting grade. Pittsburgh mills as a rule are balking at paying the prices asked, but are not successful in weakening dealers' ideas since outside districts are paying the prices.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

	Per Gross Ton
Heavy melting steel	$19.50 to $20.00
No. 1 cast, cupola size	21.50 to 22.00
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va.; Franklin and Williamsport, Pa.	21.50 to 22.00
Compressed sheet steel	17.00 to 17.50
Bundled sheet sides and ends	16.00 to 16.50
Railroad knuckles and couplers	22.50 to 23.00
Railroad coil and leaf springs	22.50 to 23.00
Low phosphorus standard bloom and billet ends	24.00 to 25.00
Low phosphorus, plates and other grades	22.00 to 23.00
Railroad malleable	17.00 to 17.50
Iron car axles	27.00 to 28.00
Locomotive axles, steel	25.00 to 26.00
Steel car axles	21.50 to 22.00
Cast iron wheels	22.50 to 23.00
Rolled steel wheels	22.50 to 23.00
Machine shop turnings	14.50 to 15.00
Heavy steel axle turnings	17.00 to 17.50
Short shoveling turnings	16.50 to 17.00
Cast iron borings	17.00 to 17.50
Heavy breakable cast	19.00 to 19.50
Stove plate	16.00 to 16.50
Sheet bar crop ends	23.00 to 24.00
No. 1 railroad wrought	16.00 to 16.50

Detroit Scrap Market

DETROIT, Sept. 11.—The market has a firm tendency and the large producers have been able to secure equipment to maintain shipments to melting points in that these points are south or in the direction of the mines. Automobile cast has been very active—some few sales having been made as high as $23.50.

The following prices are on a gross ton basis f.o.b. cars producers' yards:

Heavy melting steel	$15.25 to $15.75
Shoveling steel	14.50 to 15.50
No. 1 machinery cast	15.50 to 16.50
Cast borings	12.00 to 13.00
Automobile cast scrap	22.00 to 23.50
Stove plate	14.00 to 14.50

Chicago

Heavy Demand for Steel from Many Sources—Railroad Buying Active

CHICAGO, Sept. 12—For one important local mill, inquiry during the past week was the heaviest in a year and a half. Demand is well distributed, covering practically all commodities and coming from all of the usual sources of business, except the farm implement industry. Agricultural equipment makers commenced to buy on a moderate scale some three months ago, but orders from them have grown more infrequent as steel prices have advanced. The railroads and the car builders are still the most conspicuous factors in the market. The latter are pressing the mills hard for deliveries against contracts because the carriers are anxious for deliveries against their car orders. With a heavy coal traffic thrust upon them as the grain movement is getting under way, the roads need cars badly. As much of their present equipment is in bad order and they are behind on repair work, they want their new cars, because new equipment will operate for a considerable period without requiring attention.

While the mills are still handicapped in making the desired deliveries to the car companies, the outlook for improvement in steel production is better. The Illinois Steel Co., for example, has been able to put on two more blast furnaces at Gary and one at South Chicago, giving it 12 active stacks out of 29 in the district. At the same time, it has increased its steel output from slightly over 50 per cent to 60 per cent of ingot capacity. The Inland Steel Co., however, remains on a 60 to 65 per cent basis. While coal deliveries have improved sufficiently to enable a steel producer to put in three blast furnaces, the supply of fuel is still uncertain because of car shortage, and one merchant stack, an Iroquois furnace, was forced to bank to-day.

Evidently the rapidity with which production is resumed depends entirely on transportation. The level of steel prices shows little change, with prompt material commanding premiums as heretofore. The Inland Steel Co. has allocated among its customers much of its fourth quarter tonnage and additional orders will have to be squeezed into present rolling schedules.

Pig Iron.—Prices of local pig iron remain unchanged, although production has been further curtailed. While the mines are again producing, a shortage of cars is interfering with coal movement. The seriousness of the transportation situation is indicated by the fact that an Iroquois furnace was forced to bank to-day. This reduces the number of active stacks represented by the leading Northern merchant, to four, namely, one Iroquois, one Federal, one Mayville, and the Zenith furnace. Car scarcity is also impeding the shipment of iron, for the railroads will not give the furnaces gondola cars with sides exceeding 44 in. in height, as they are assigned exclusively to the movement of coal. Demand is largely for prompt iron, although some inquiries for both first and second quarter deliveries, regarded as in the nature of feelers, have been received. Additional sales of St. Louis iron have been made in this territory, one for 1000 tons of malleable for prompt shipment being placed with a Wisconsin melter and another for 200 tons of foundry for fourth quarter being closed with a Northern Illinois user. Southern iron is still difficult to obtain because of transportation conditions. Two Southern furnaces are quoting $25 base, Birmingham, with a dollar differential for each point 50 per cent of added silicon, and another stack is quoting $26. The Sloss-Sheffield Steel & Iron Co. entered the market last week at $25 base, Birmingham, with a 50c. differential, but has since withdrawn. The Virginia Iron, Coal & Coke Co. is soliciting business for fourth and first quarters at $32 base furnace, the freight to Chicago being $6.18. Silvery has advanced to a minimum of $41.50, Jackson furnace, for 8 per cent. A sale of two cars of 7 per cent on the new basis has been made in Chicago. Low phosphorous pig iron is scarce and both copper free and copper bearing are commanding about the same prices. A sale of 300 tons of copper bearing in Chicago and another of 100 tons of copper free in Milwaukee were both closed at the equivalent of approximately $38 Valley furnace.

Quotations on Northern foundry, high phosphorus malleable and basic irons are f.o.b. local furnace and do not include a switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards, or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$36.15
Northern coke, No. 1, sil. 2.25 to 2.75	33.00
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	32.00
Northern high phos.	32.00
Southern No. 2	$31.00 to 32.00
Malleable, not over 2.25 sil.	32.00
Basic	32.00
Low phos., Valley furnace, sil. 1 to 2 per cent copper free	38.00
Silvery, sil. 8 per cent	46.29

Ferroalloys.—A carload of spiegeleisen for local shipment has been sold at $50, delivered. Ferromanganese for October shipment is being offered at $67.50, seaboard, but prompt material is difficult to obtain. Prices on 50 per cent ferrosilicon have advanced to $65, delivered, for both prompt and future shipment.

We quote 78 to 82 per cent ferromanganese, future, $75.06; prompt, $82.56, delivered; 50 per cent ferrosilicon, $55 delivered on contract and $65 prompt delivery; spiegeleisen, 18 to 22 per cent, $50, delivered.

Plates.—Orders and inquiries for railroad cars and oil storage tanks are few, but demand on the mills for plates is still heavy. Plates, as well as shapes and bars, continue to be bought by the railroads for car repair works. The quotation on tank plates for indefinite shipment remains 2.05c., Chicago, while the minimum on material for specific delivery is 2.30c., Chicago. As high as 2.25c., Pittsburgh, is being paid for shipment within a few weeks. The Inland Steel Co. has allocated much of its fourth quarter tonnage among customers, but can still offer November shipments.

The mill quotation is 2.05c. to 2.59c., Chicago. Jobbers quote 2.90c. for plates out of stock.

Cast Iron Pipe.—Detroit has placed 800 tons with the United States Cast Iron Pipe & Foundry Co. and the same maker is low bidder on 188 tons for Milwaukee. Marshalltown, Iowa, took tenders yesterday on 140 tons and Chicago will receive bids on 200 feet of 12-in. and 1000 feet of 8-in. class B pipe Sept. 13.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $50.70 to $52.20; 6-in. and above, $46.70 to $48.20; class A and gas pipe, $3 extra.

Bars.—Demand for mild steel bars is heavy from all sources except the farm implement industry. The minimum price for indefinite shipment remains 1.95c., Chicago, while the best quotation on material for specific delivery is 2.10c., Chicago. A mill able to make prompt shipment is selling at from 2.50c. to 2.60c., Chicago. Sales by Eastern mills have been made at 2.25c., Pittsburgh. Demand for bar iron is decreasing, but prices remain firm at 2.25c. to 2.50c., Chicago. Rail steel buying is improving, with business coming largely from manufacturers, notably bedstead makers. Bar equipment manufacturers also are buying after a long absence from the market. Mills here are quoting 2c. to 2.10c., Chicago Heights, while the Moline mill has advanced to 2c. f.o.b. plant or slightly over 2.15c., delivered Chicago.

Mill prices are: Mild steel bars, 1.95c. to 2.50c., Chicago; common bar iron, 2.25c. to 2.50c., Chicago; rail steel, 2c. to 2.10c., Chicago mill.

Jobbers quote 2.80c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.80c. for rounds and 4.30c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 2.50c. base; hoops, 3.90c.; bands, 3.55c.

Rails and Track Supplies.—The placing of rail business for 1923 delivery still awaits the naming of a price. Inquiry for spikes, bolts, angle bars and tie plates is heavy and orders are in good volume, one mill having booked an aggregate of 50,000 kegs of spikes and bolts.

Standard Bessemer and open-hearth rails, $40; light rails rolled from new steel, 2c. to 2.25c., f.o.b. makers' mills.

Standard railroad spikes, 2.75c. to 3c., mill; track bolts with square nuts, 3.75c. to 4c., mill; tie plates, steel and iron, 2.15c. to 2.25c., f.o.b. mill; angle bars, 2.40c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.50c. base and track bolts 4.50c. base.

Wire Products.—Buyers continue to press business on the mills and the prospects for a heavy fall trade

are good. Orders from the South are particularly liberal and while there is some apprehension concerning the Western and Northern agricultural regions because of the low level of grain prices, it is pointed out that the crops are very large and the returns to the farmer will be sizable though the unit prices per bushel are low. Mill operations have not yet improved, but betterment is in sight. For mill prices, see finished iron and steel, f.o.b. Pittsburgh, page 683.

We quote warehouse prices, f.o.b. Chicago: No. 9 and heavier black annealed wire and No. 9 and heavier bright basic wire, $3.20 per 100 lb.; common wire nails, $3.35 per 100 lb.; cement coated nails, $2.75 per keg.

Bolts and Nuts.—Specifications against contracts closed at the old discounts are heavy. Business at the new discounts is rather light, but buyers are expected to close contracts soon for their fourth quarter requirements. Ruling prices are those on page 683 except that the basing point is Chicago.

Jobbers quote structural rivets, 3.50c.; boiler rivets, 3.60c.; machine bolts up to ⅞ x 4 in., 50 per cent off; larger sizes, 50 off; carriage bolts up to ⅞ x 6 in., 45 off; larger sizes, 45 off; hot pressed nuts, squares and hexagons, tapped, $2.75 off; blank nuts, $2.75 off; coach or lag screws, gimlet points, square heads, 55 per cent off; quantity extras are unchanged.

Sheets.—The Inland Steel Co. has allocated practically all the fourth quarter tonnage it cares to book at this time. Customers took all the tonnage allocated to them and in most cases wanted more. Demand continues active with inquiries coming from all sections of the country and from abroad.

Mill quotations are 3.35c. to 3.50c. for No. 28 black, 2.50c. to 2.60c. for No. 10 blue annealed and 4.35c. to 4.50c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Reinforcing Bars.—A surprising number of new jobs, many of them large ones, are being placed notwithstanding the caution of sellers. Deliveries from the mills are still very slow, but improvement is looked for with the betterment in the fuel situation. In the meantime, however, dealers are carefully watching their warehouse stocks. Recent awards include:

Durant Motors Co., plant, Flint, Mich., 700 tons, to Paul J. Calman Co.

Reynolds Wire Co., plant, Dixon, Ill., 200 tons, to Paul J. Calman Co.

Illinois Improvement Co., Thirty-ninth Street sewer, Chicago, 375 tons, to Concrete Steel Co.

Kentucky highway work, 300 tons, to Corrugated Bar Co.

Bridge, Constantine, Mich., 100 tons, to Corrugated Bar Co.

High school, Wichita, Kan., 400 tons, to Concrete Engineering Co.

Filtration plant, Oklahoma City, Okla., 200 tons, to Concrete Steel Co.

Bridges, northern Minnesota, 250 tons, to Corrugated Bar Co.

Pending business includes:

Chicago Trust Co. Building, Chicago, 400 tons.

Pine Grove Apartment Building, Chicago, 300 tons.

South Side High School, St. Louis, 550 tons.

Public Service Co. of northern Illinois, power station, Waukegan, Ill., 100 tons.

Structural Material.—A considerable number of fabricating awards have been reported during the past week, some of them covering large tonnages. Shops are crowded with work, but continue to quote on new business. Demand for plain material is heavy with 2.05c., Chicago, the quotation on steel for indefinite delivery and 2.25c., Chicago, the minimum price for specific shipment. Eastern mills are taking business for prompt shipment at as high as 2.15c., Pittsburgh.

The mill quotation on plain material is 2.05c. to 2.49c., Chicago. Jobbers quote 2.90c. for plain material out of warehouse.

Warehouse Prices.—Local jobbers have advanced bolts and nuts in keeping with the advances of manufacturers. New discounts are to be found under bolts and nuts. Small rivets have also been advanced, the discount being 55.

Old Material.—The market continues to advance in price in all departments. A feature of the week's business was the purchase of open-hearth grades by two of the leading steel mills. Buying of iron mill grades is not so brisk as a week ago, and variations in consumer demand for other grades are also to be noted, but in the aggregate the available supply of scrap is far short of demand. Recent advances have caused some scrap to be released by country dealers, but this has not been in sufficient volume to weaken the market at a time when railroad offerings are almost nil. The Santa Fe, the Soo Line and the Chicago Great Western are advertising about 300 tons each.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$22.00 to $22.50
Cast iron car wheels	23.50 to 24.00
Relaying rails	25.00 to 30.00
Rolled or forged steel car wheels	22.50 to 23.00
Rails for rolling	19.50 to 20.00
Steel rails, less than 3 ft.	21.50 to 22.00
Heavy melting steel	18.50 to 19.00
Frogs, switches and guards cut apart	18.50 to 19.00
Shoveling steel	18.25 to 18.75
Drop forge flashings	12.50 to 13.00
Hydraulic compressed sheet	14.25 to 14.75
Per Net Ton	
Iron angles and splice bars	22.00 to 22.50
Steel angle bars	18.50 to 19.00
Iron arch bars and transoms	22.50 to 23.00
Iron car axles	24.50 to 25.00
Steel car axles	19.50 to 20.00
No. 1 busheling	15.50 to 16.00
No. 2 busheling	10.50 to 11.00
Cut forge	17.00 to 17.50
Pipes and flues	13.00 to 13.50
No. 1 railroad wrought	18.00 to 18.50
No. 2 railroad wrought	17.00 to 17.50
Steel knuckles and couplers	19.50 to 20.00
Coil springs	21.00 to 21.50
No. 1 machinery cast	22.00 to 22.50
No. 1 railroad cast	19.75 to 20.25
Low phos. punchings	17.00 to 17.50
Locomotive tires, smooth	16.00 to 16.50
Machine shop turnings	10.50 to 11.00
Cast borings	13.00 to 13.50
Stove plate	17.50 to 18.00
Grate bars	17.50 to 18.00
Brake shoes	17.50 to 18.00
Railroad malleable	21.00 to 21.50
Agricultural malleable	21.00 to 21.50

Little Change in Refractories

PITTSBURGH, Sept. 11.—The situation in refractories has undergone little change since last reports other than that with the upward slant of iron and steel plant operations, incident to the settlement of the coal strike, specifications by that industry are heavier than they had been recently. Strictly new business for blast furnace and steel works use, if by-product plant requirements are excluded, is not especially heavy, since orders for brick for iron making and steel melting units were pretty heavy prior to the advances made Aug. 23, and most current shipments are against those orders. The largest new projects are the new open-hearth furnace plants to be built by the Wisconsin Steel Co., South Chicago, and the Otis Steel Co., Cleveland, and the by-product plants at Clairton, Pa., and Weirton, W. Va. Because costs have been increased by the coal strike settlement and the wage increase made to other kinds of brick plant labor, the lately established prices are well observed on new business. The leading maker of silica brick in the Birmingham, Ala., district has announced a price of $48 per 1000. A further advance of $5 per 1000 has just been announced in the price of chrome brick, the new quotation being $45 per 1000.

We quote per 1000, f.o.b. works:

Fire clay	High Duty	Moderate Duty
Pennsylvania	$40.00 to $43.00	$36.00 to $40.00
Ohio	40.00 to 43.00	36.00 to 40.00
Kentucky	40.00 to 43.00	35.00 to 39.00
Illinois	40.00 to 42.00	37.00 to 39.00
Missouri	40.00 to 42.00	35.00 to 39.00
Ground fire clay, per net ton		7.00 to 8.00
Silica brick:		
Pennsylvania		45.00
Chicago		53.00
Birmingham		48.00
Ground silica clay, per net ton		9.00
Magnesite brick:		
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.)		60.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)		32.00
Chrome brick:		
Standard size, per net ton		50.00

New York

Much Uncertainty as to Embargoes—Foreign Iron Prices Lower

NEW YORK, Sept. 12.—Embargoes declared by nearly all Eastern railroads against almost all kinds of freight except foodstuffs and anthracite, have caused much apprehension among iron and steel manufacturers, and opinions vary as to what the effect will be. While it is hoped that it will not be necessary to continue the embargoes for a long time, there is great uncertainty and developments will be awaited with keen interest.

Pig Iron.—There is marked scarcity of domestic iron, but on the other hand, makers are not apparently very anxious to place orders. One broker who has a fair tonnage of iron for sale circularized his trade extensively and met little response. Prices of the domestic iron are on a basis of $32, Eastern furnace, for No. 2 plain, that price being made by a steel company, while other sellers ask $34. One broker who was unable to obtain a few hundred tons of domestic iron for prompt delivery paid $36, Boston, for foreign iron. The principal sales of the week were foreign iron, including 8000 to 10,000 tons by one firm and about 5000 tons by another. Reports as to prices on Scotch and Continental iron vary greatly. One importer has disposed of 2000 to 3000 tons at about $22.50, c.i.f. New York, for iron equivalent to No. 2X, but sales of Scotch are being made at from $30 to $32, and French, Belgian and other Continental irons analyzing 2.50 to 3 per cent silicon at $26.50 to $28, c.i.f. New York. The Virginia Iron, Coal & Coke Co. has announced that it will blow in a furnace in about 10 days and will sell on a basis of $32 for No. 2 plain for delivery the last quarter of this year and first quarter of 1923. So far no sales have been reported.

We quote delivered in the New York district as follows, having added to furnace prices $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$36.27 to $38.27
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	35.27 to 36.27
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	34.27 to 36.27
Buffaalo, sil. 1.75 to 2.25	37.91 to 38.91
No. 2 Virginia, sil. 1.75 to 2.25	No. sales

Ferroalloys.—An active demand for British ferromanganese continues and sales are reported of 3000 to 5000 tons in the last week at $67.50, seaboard. One seller has sold all the October shipment available and some of his November allotment. Very little spot alloy is offered, but two carloads are noted at a considerable advance above the prevailing quotation for forward delivery. The spiegeleisen market is only moderately active. Both domestic and foreign alloy are available at $38 to $39, seaboard or furnace, and sales of several lots of 50 to 100 tons each of British alloy for importation are noted. There is a fairly active demand for prompt and early delivery of 50 per cent ferrosilicon at a minimum of $57.50 per ton, delivered. Some producers are quoting a minimum of $65 per ton, delivered. Specifications on contract made some time ago at lower prices are good. No activity in the manganese ore market is noted, but importations in July were very heavy at 62,518 gross tons, the largest for any month this year. In this connection it is also of interest to note that Government statistics show that the importations of ferromanganese in July were 25,841 tons, also the largest for any month this year and for any month in several years. Quotations are as follows:

Ferromanganese, domestic, seaboard, per ton	$67.50
Ferromanganese, British, seaboard, per ton	$67.50
Spiegeleisen, 17 to 19 per cent, furnace	$38.00
Spiegeleisen, 20 per cent, furnace	$38.00 to $39.00
Ferrosilicon, 50 per cent, delivered, per gross ton, carloads	$57.50 to $65.00
Ferrosilicon, 10 to 15 per cent, delivered, per gross ton	$38.00 to $40.00
Ferrotungsten, per lb. of contained metal	40c. to 50c.
Ferrochromium, 4 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr., delivered	12c. to 14c.
Ferrovanadium, per lb. of contained vanadium	$3.00 to $3.50
Ferrocarbontitanium, 15 to 18 per cent, in carloads, per net ton	$200.00
Ores	
Manganese ore, foreign, per unit, seaboard	28c. to 30c.
Tungsten ore, per unit, in 60 per cent concentrates, nominal	$3.50 up
Chrome ore, basis 48 per cent Cr_2O_3, crude, per ton, Atlantic seaboard	$15 to $18.50
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	45c. to 50c.

Finished Iron and Steel.—Though there is a continued easing in the steel mill situation, the willingness of the mills to sell a little more freely has not brought out a corresponding interest among consumers. Whether consumers believe that the increase in the coal and coke supply will eventually bring about an easier price situation in steel, or whether they are loath to commit themselves on steel purchasers until their coal supply is well assured, does not appear clear, but it is conceded that some influence has checked the eagerness of consumers which was displayed when steel was less easy to get. There is quite a wide spread in the price which mills are quoting on plates, shapes and bars. On plates quotations have been made from 2.10c., Pittsburgh, to 2.50c., but very little business has been placed at the latter figure. A majority of the mills are asking 2.25c., Pittsburgh, but it is difficult to negotiate anything but small or very urgent business on that basis. Shapes and bars are somewhat easier than plates, and are to be had from 2c. to 2.25c., Pittsburgh. Wire products have been advanced by some makers to the basis of $2.50 per 100 lb. for plain wire and $2.75 per 100 lb. keg, base, for wire nails. There is a falling off in fabricated steel business which mills and fabricators are unable to account for, except that buying generally has been checked. Inquiry by railroads for rolling stock also appears to have become considerably smaller in volume. For construction work on the Queens Boulevard, Long Island, bids are being asked on 4000 tons of concrete reinforcing bars.

We quote for mill shipments, New York delivery, as follows: For indefinite delivery, soft steel bars, structural shapes and steel plates, 2.19c. to 2.24c.; for delivery in a number of weeks, soft steel bars and plain structural material, 2.34c. to 2.59c.; steel plates, 2.44c. to 2.84c.; bar iron, 2.59c.

Cast-Iron Pipe.—Pipe makers are well filled with orders for the remainder of the year. Deliveries on the small sizes are still extended, from three to four months being about the best offered by one foundry in this territory. No new municipal tenders are reported. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $54.50; 4-in. and 5-in., $59; 3-in., $64.80, with $4 additional for Class A and gas pipe.

Old Material.—Prices continue strong all along the line. The tendency generally is upward, with cast iron in greater demand than steel. Practically all mills are buying, the only obstacle to the movement of heavy tonnages being a disinclination on the part of dealers to sell large orders except on much advanced prices. Although $18.50 per ton is reported as the best price done in Pittsburgh on heavy melting steel, offerings at as high as $20.50 per ton without takers is reported. Shipments by barge to Buffalo are stated to have declined somewhat. No. 1 heavy melting steel is still quotable at $11.50 to $12, and railroad steel ranges from $12.75 to $13.25 per ton. Not only does the upward trend of prices seem to be continuing, but there are rumors of sales of various items at higher prices than those now prevailing.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard	$11.50 to $12.00
Steel rails, short lengths, or equivalent	12.75 to 13.25
Rerolling rails	12.75 to 13.25
Relaying rails, nominal	27.00 to 28.00
Steel car axles	17.00 to 18.00
Iron car axles	23.00 to 24.00
No. 1 railroad wrought	15.00 to 15.50
Wrought iron track	12.75 to 13.25
Forge fire	10.00 to 10.50
No. 1 yard wrought, long	13.00 to 13.50
Cast borings (clean)	10.75 to 11.25
Machine-shop turnings	10.25 to 10.75
Mixed borings and turnings	10.25 to 10.75
Iron and steel pipe (1 in. diam., not under 2 ft. long)	10.75 to 11.25
Stove plate	12.00 to 12.50
Locomotive grate bars	12.00 to 12.50
Malleable cast (railroad)	13.00 to 13.50
Cast-iron car wheels	13.50 to 14.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast	$18.50 to $19.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	16.50 to 17.00
No. 1 heavy cast, not cupola size	14.00 to 14.50
No. 2 cast (radiators, cast boilers, etc.)	12.50 to 13.00

Coke.—The coke market continues slightly easier and much difficulty is experienced in getting high-grade fuel. Furnace coke is quoted at $10.50 to $12, Connells-

ville ovens, and foundry at $13 to $14.50, with by-product $14, seaboard.

Warehouse Business.—Active business is reported by practically all warehouses here, those handling structural material stating that the demand is particularly good in this line. While prices are strong and the tendency undoubtedly upward, the consensus of opinion seems to be that in the main prices have about reached their limit. A slight decline in the demand for black and galvanized sheets is noted. Brass and copper warehouses report good business, but no change in prices. Wrought iron and steel pipe dealers state that there has been a considerable improvement in business during the past few weeks and a distinct shortage of small sizes in both the iron and steel pipe is being felt. We quote prices on page 712.

High-Speed Steel.—The market is quiet and prices unchanged. Producers continue to quote 18 per cent tungsten high-speed steel at about 75c. per lb., with special brands of some companies ranging up to 90c. per lb.

Birmingham

Round Lot of Basic Sold at High Price—Slight Increase in Stocks

BIRMINGHAM, ALA., Sept. 12.

Pig Iron.—At the close of last week, the Birmingham iron market base was a spread from $25 to $27.50 with business done at both prices. The chief business done at $27.50 was 10,000 tons of basic for delivery from October to January, and is said to have been taken by a Kentucky steel maker. Other sales at this base were car load and up to 100-ton lots for prompt delivery. For immediate delivery, any price asked was accepted by several stranded consumers. On the other hand, the principal foundry maker did not advance above $25, Birmingham base, and is understood to have sold several thousand tons during the week in lots as high as 500 tons. St. Louis is credited with having taken 1000 tons of Birmingham iron at $25 base. The leading steel interest, which does not consider itself a regular participant in the foundry iron trade, is known not to be holding iron at higher than $25, and it is presumed that a large tonnage might be placed at $24. The solider part of the market at the close of the week was at $25 base, and in this part is the largest remaining unsold tonnage. If the Eastern markets steady down this week, the Birmingham market should be back to a base of $25 maximum. Most makers wish the advance to stop. The surprise of the week was the showing of stocks on yards. On a production of 204,000 tons, only 35,000 tons was added to the low record of Aug. 1. Stocks on Alabama furnace yards Aug. 1 and Sept. 1 were as follows: foundry, 25,000 and 58,000 tons; machine cast, 1000 and 4800; warrants, 2000 and 1700; basic, 8500 and 7100; totals, 36,400 and 72,000 tons. The extreme low of basic indicates the heavy operations in finishing mills. The largest individual holdings were 21,000 tons.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	$25.00 to $27.50
Basic	24.00 to 27.50
Charcoal, warm blast	33.00 to 34.00

Finishing Mills.—Except for slowing down to 5000 tons of rails a week in the Ensley mill on account of the car situation, the Tennessee company continues 100 per cent operations with double turn in Bessemer, Fairfield and Ensley mills. The plant of the Chickasaw Shipbuilding & Car Co. has begun turning out 25 new steel cars together with numbers of repaired ones daily. This quota of new cars is the capacity for which the plant was planned. The Conners Steel Co. is operating both Woodlawn mills and shipping cotton ties on a brisk demand. A small shipment of hoops was made to China. The Gulf States Steel Co. and the American Steel & Wire Co. operate finishing mills at or near capacity under a very active demand.

Cast Iron Pipe.—The pipe markets are strong, but new business is not so great owing to unsteadiness of iron prices and poor delivery of pipe. The pressure pipe base remains at $40 and the sanitary base at $60.

Coal and Coke.—The coal market has eased up since withdrawal of the Western demand. Steam coal maximum is at $3. Coke is very strong at $8 and $10. The Sloss-Sheffield Steel & Iron Co. reduced its by-product coke pile by 35,000 tons during the month.

Old Material.—The scrap market has shown much more life, with advancing prices and heavy movements from yards at these prices. The whole list has been revised.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails	$15.50 to $16.00
No. 1 steel	14.50 to 15.00
No. 1 cast	17.00 to 19.00
Car wheels	17.00 to 19.00
Tramcar wheels	16.00 to 18.00
Stove plate	15.00 to 16.00
Cast iron borings	8.00 to 9.00
Machine shop turnings	8.00 to 9.00

Boston

Sales of Foreign Pig Iron Continue in Lots Not Exceeding 300 Tons

BOSTON, Sept. 12.—A good business in foreign pig iron in lots not exceeding 300 tons is reported for the past week. A reliable estimate of aggregate sales cannot be given due to the fact that some lots of iron represented resales through brokers. Scotch continues the most active foreign iron with sales covering September, October, November and December sailings. Continental irons are more attractive to buyers than heretofore because of their relative cheapness. The demand for English iron is much less than either Scotch or Continental. No. 3 Scotch in this market is $30 to $33 c.i.f. local dock, English $27 to $29, and Continental $26.50 to $31, depending on analysis. A limited tonnage of spot Scotch sold at $35 on cars dock. It now develops a Massachusetts textile machinery maker bought 2000 tons Continental, silicon 2.50 to 3.00, at $26.50, instead of 1000 tons previously reported. In domestic irons, activity centers in Alabama. A small tonnage sold ex-dock Providence, R. I., at $35 base, and on cars at furnace at $28 base. Due to the condition of railroad equipment, car loadings are smaller. For instance, cars heretofore loaded with 60 tons are now loaded with 30 tons. This practice places an additional cost burden on the New England foundry.

We quote delivered prices, on the basis of the latest reported sales, now infrequent, and as follows, having added to furnace prices $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75	$38.15 to $39.15
East. Penn., sil. 1.75 to 2.25	37.65 to 38.65
Buffalo, sil. 2.25 to 2.75	39.41 to 41.41
Buffalo, sil. 1.75 to 2.25	38.91 to 40.91
Alabama, sil. 2.25 to 2.75	35.10 to 38.10
Alabama, sil. 1.75 to 2.25	34.60 to 37.60

Warehouse Business.—The recent advance in iron and steel has not checked business, which holds to the August rate of activity. Warehouse quotations in structural steel take a wider range than heretofore, holders of small stocks quoting as high as $4.50 a ton base, compared with $3.25, the low point of the market. Stocks of small rounds, flats and bands continue broken. Bolts and nuts have gone up 10 per cent, but no change in washer prices is noted. Cut and hard steel nails have advanced 15c. a keg, the former now being quoted at $4.05 per keg base, and the latter at $8 base. Small rivets are 50 and 10 per cent discount, contrasted with 60 per cent heretofore. The call for large rivets is only fair at best. Jobbers anticipate an advance in wood screws shortly. Coach and lag screws have advanced 10 per cent.

Jobbers quote: Soft steel bars, $3.25 per 100 lb. base; flats, $3.85; concrete bars, $3.25; structural steel, $3.25 to $3.50; tire steel, $4.50 to $4.85; open-hearth spring steel, $5 to $6.50; crucible spring steel, $12; steel bands, $4.25; hoop steel, $4.75; cold rolled steel, $4 to $4.50; refined iron, $3.25; best refined iron, $4.50; Wayne iron, $5.50; Norway iron, $6 to $6.50; plates, $3.35 to $3.55; No. 10 blue annealed sheets, $4.15 per 100 lb. base; No. 28 black sheets, $5.40; No. 28 galvanized sheets, $6.40.

Coke.—New England by-product foundry coke producers are making freer deliveries on contracts than heretofore, due to their better position as to coal supplies. Foundries therefore show less interest in coke made outside this territory. Definite arrangements have been made for further shipments of Alabama by-product coke into New England. Most of it will be unloaded at Providence, R. I., due to the risk of demurrage at Boston. At present there is a large fleet of foreign steamers in Boston harbor with coal under heavy demurrage. Alabama coke is $19 delivered and English coke continues at $15 to $16 on local dock. More of such cokes are being purchased by public utilities, etc., than by New England foundries. Connellsville coke is offered at $14.50 to $14.75 ovens with few takers.

Old Material.—Renewed activity in old materials is noted with a further strengthening in prices. The American Steel & Wire Co., Worcester, Mass., has purchased heavy melting steel at $14.50 a ton delivered, while sales against Pennsylvania mill contracts at $12 to $13 on cars shipping point are reported. A Rhode Island concern is in the market for railroad malleable at $15 a ton delivered. Sales of wrought iron at $18 delivered Pennsylvania, or about $13 on cars here, figure in the past week's transactions. The demand for mixed borings and turnings is brisk and the market is easily 50c. a ton higher. Short shoveling machine shop turnings easily command $10.25 while bush material has sold at around $9.25 and higher. Bundled skeleton suitable for steel mills sold at $9 to $9.50, while selected forged scrap changed hands at $10 and $10.50. The Sullivan Machinery Co. is in the market for 100 tons of No. 1 cotton mill machinery cast, and the Saco-Lowell Shops for 200 tons. Such material as well as general run of machinery cast is in limited supply. Foundries have absorbed stocks in small yards about as fast as accumulated. A sale of No. 2 machinery cast, the first noted in some time, at $17 delivered, is reported.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$20.00 to $21.50
No. 2 machinery cast	18.00 to 19.00
Stove plate	15.00 to 16.00
Railroad malleable	16.50 to 17.00

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$12.00 to $13.00
No. 1 railroad wrought	14.50 to 15.00
No. 1 yard wrought	12.50 to 13.00
Wrought pipe (1 in. in diameter, over 2 ft. long)	10.00 to 10.50
Machine shop turnings	9.25 to 10.25
Cast iron borings, rolling mill	11.00 to 11.50
Cast iron borings, chemical	13.50 to 14.00
Blast furnace borings and turnings	9.50 to 10.00
Forged scrap	10.00 to 10.50
Bundled skeleton	9.00 to 9.50
Street car axles	18.00 to 20.00
Street car wheels	15.00 to 15.50
Rerolling rails	12.50 to 13.00
Shafting	18.00 to 18.50

Cincinnati

Little Pig Iron for Prompt Shipment—Virginia Furnace Will Resume

CINCINNATI, Sept. 11.—There was little activity in the local pig iron market during the past week, the reason apparently being the lack of iron available for prompt shipment. Melters are not contracting ahead to any extent, the majority of the orders booked being carload lots for immediate shipment. The railroad situation is handicapping Southern furnaces greatly, and while a few carloads came through last week, most third quarter shipments are still en route. Receipt of this iron will mean that much less to be supplied during fourth quarter, but stocks on foundry yards have been depleted to such an extent that it is expected that melters will be willing to take in all iron now on contract, with enough additional tonnage to build up a stock for emergency purposes. Prices, while ruling at the same level as last week, are very firm, and with stocks so low and demand for fill-in purposes becoming more insistent, further advances are considered likely. A large Southern interest opened its books for last quarter at $25, Birmingham basis, but Southern iron has sold, for September shipment, at $27 and $30 is being quoted by several furnaces. Southern Ohio iron is available in limited quantities at $32 to $34, and silveries at $41.50 for 8 per cent. No standard basic is available, but there are several small lots of off-iron being offered. Sales include 700 tons of southern Ohio basic to an Indiana steel company, 500 tons of Southern foundry to an Indiana melter, and 500 tons of malleable to an Indiana foundry. We also note a sale of 500 tons of ferromanganese to a Wheeling district consumer and 3000 tons of spiegel to a northern Ohio interest. Two inquiries for malleable, for 800 and 500 tons respectively, are current. Jisco silvery furnace will blow in about Sept. 15, and a furnace of the Virginia company, the first to operate in that State for over a year, will go in in about ten days. One Ashland stack of the American Rolling Mill Co. has gone out for relining.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$29.05
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	29.55
Ohio silvery (nominal), 8 per cent	43.77
Southern Ohio coke, sil. 1.75 to 2.25 (No 2)	34.27
Basic Northern	32.27
Malleable	34.27

Plant Operations.—The American Rolling Mill Co.'s plants at Middletown and Zanesville continue to operate at capacity, with the Ashland works running at approximately 60 per cent. With a higher stage in the Ohio River following a "wave" the Whitaker-Glessner Co. at Portsmouth is assured of a coal supply sufficient to insure continuous operation for a few weeks. The Andrews Steel Co. and the Newport Rolling Mill Co. are maintaining their recent schedules of operations. It looks as though the steel plants in this district have passed through the worst of the coal shortage, and it is expected that current schedules will be maintained.

Finished Material.—The demand is insistent for prompt shipment materials, but more resistance is developing among purchasers to paying the higher prices asked. This is noticeably the case in the matter of plates, the demand for which has fallen off considerably. An independent company recently offered plates in the district, delivery in four to six weeks, at 2.25c. Pittsburgh, but the response by consumers has been disappointing. Bars, however, are in better demand, and 2.25c. has been done on several orders with delivery promises of six weeks. Sheets, too, are active. Most of the independent mills are not quoting further ahead than October, the prevailing prices being 2.75c. on blue annealed, 3.60c. on black, 4.50c. on galvanized and 4.95c. on automobile body sheets. The demand for wire products is improving, but shipments are poor owing to difficulty in securing box car equipment. No price changes in wire products have been made by mills in this district, though it is expected that further advances will soon be forthcoming. There is little activity in the structural field, three highway bridges being the only new inquiries out. In concrete reinforcing bars, a factory building in Cincinnati has been awarded, the Bourne-Fuller Co. receiving the order for approximately 250 tons.

Warehouse Business.—Local jobbers continue to do a heavy business, and are placing fair-sized orders to replenish their stocks. Concrete reinforcing bars and structural shapes are moving well, and nails and wire fence are being inquired for with more regularity. Roofing sheets are also in much improved demand. Prices, while strong, remain as last quoted, although there are prospects of a further upward movement of about $2 a ton.

Cincinnati jobbers quote: Iron and steel bars, 2.95c. base; reinforcing bars, 3.05c. base; hoops, 4.05c. base; bands, 3.85c. base; shapes and plates, 3.05c. base; cold-rolled rounds, 3.75c. base; cold-rolled flats, squares and hexagons, 4.25c. base; No. 10 blue annealed sheets, 4c.; No. 28 black sheets, 4.70c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, $2.85 per 100 lb.; common wire nails, $3.05 per keg, base.

Coke.—There is fair activity in the coke market, and we note a sale of 900 tons of by-product fuel at $16, ovens, for immediate shipment. On contract coke by-product producers are naming $11, ovens, for September shipment. Connellsville furnace is quoted at

$10 to $11, foundry at $12.50 to $14, Wise County furnace at $11, foundry at $13.50 to $14, New River foundry at $14 to $15 and Pocahontas foundry at $14.

Old Material.—The scrap market is strong and active. Several steel mills in this district are in the market for various tonnages, but with embargoes existing on a number of railroads, it is difficult to close deals. Cast grades are also more active, due to the shortage of pig iron, and some fair sized tonnages are being booked. Prices are very firm, with some grades bringing 50c. a ton over last week. We note an inquiry for 1000 tons of axles.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

	Per Gross Ton	
Bundled sheets	$9.50 to	$10.00
Iron rails	15.50 to	16.00
Relaying rails, 50 lb. and up	26.50 to	27.00
Rails for rolling	14.50 to	15.00
Heavy melting steel	15.00 to	15.50
Steel rails for melting	14.00 to	14.50
Car wheels	17.00 to	17.50
Per Net Ton		
No. 1 railroad wrought	13.50 to	14.00
Cast borings	10.50 to	11.00
Steel turnings	9.50 to	10.00
Railroad cast	16.00 to	16.50
No. 1 machinery	19.50 to	20.00
Burnt scrap	10.50 to	11.00
Iron axles	19.50 to	20.00
Locomotive tires (smooth inside)	12.50 to	13.00
Pipes and flues	7.50 to	8.00

Buffalo

Marked Scarcity of Basic Pig Iron—Moderate Sales of Foundry Grades

BUFFALO, Sept. 12.—Increased blast furnace operation which several producers expect to put in effect in September is more likely to be devoted to the production of basic iron than foundry iron and several furnaces predict basic iron will be much higher in this district this year. None is available now and if sales were made under present conditions, it is likely this product would bring $35. Sales of foundry iron continue for small quantities and the aggregate business here does not exceed 2000 tons for the week. For No. 2 plain $35 has been asked and received by the only one of the five producers who has foundry iron for sale. All sales are scattered and are for spot shipment; only a small quantity of last quarter iron has been sold here. Two furnaces are preparing to put stacks in blast this month. The falling off of inquiry is not a matter of serious concern to Buffalo producers at this time because those who normally have merchant iron for sale have sufficient business booked ahead to warrant their disinterest in further sales. Rogers, Brown & Co. are working on the 70,000 ton order placed last spring by the American Radiator Co. and two other furnaces have in excess of 10,000 tons each contracted for, not permitting any addition to new business.

We quote f.o.b. per gross ton Buffalo as follows, the higher prices being for early shipment:

No. 1 foundry, 2.75 to 3.25 sil.	$35.00 to	$36.00
No. 2X foundry, 2.25 to 2.75 sil.	34.00 to	35.00
No. 2 plain, 1.75 to 2.25 sil.	34.00 to	34.50
Basic		34.00
Malleable		36.00
Lake Superior charcoal		36.28

Finished Iron and Steel.—Return to the market on a wider variety of steel products by the local branch of a large independent is the only new development based on the easier fuel situation in this district. This interest is able to take bar business in a restricted way; acceptances subject to its ability to fit in tonnages on rolling schedules now existent. Acceptances on plates and structural shapes are freer. There is likelihood of an advance in tin plate prices and sheet demand with all sellers is strong. The labor shortage grows more serious and this is expected to be an obstacle to full acceptance of large tonnages regardless of any improvement in the coal situation. Demand for wire products is big and the leading wire maker is interested only in caring for its regular trade. No new structural projects have appeared and the general unsettled labor situation is expected to hold up a number of projects now in architects' offices. The maximum bar price is 2.25c. and bar tonnages named in inquiries range from carload lots to 200 tons. A price of 1.95c. is now said to be the lowest quotation on bars.

We quote warehouse prices, Buffalo, as follows: Structural shapes, 3.10c.; plates, 2.90c.; soft steel bars, 3.[illegible]c.; bands, 3.80c.; blue annealed sheets, No. 10 [illegible], galvanized steel sheets, No. 28 gage, 5.85c.; [illegible] sheets, No. 28, 4.85c.; cold rolled round shafting, 3.95c.

Old Material.—Heavy melting steel has advanced 25c. and the ruling quotation is now $17 to $17.50; with all mills buying, the situation amounts to a shortage of this product, or at least a shortage of large tonnages. Mills are not as rigid in their inspections as they were a few weeks ago when larger tonnages were available. A shortage of cars is holding up the movement of old material offered by the railroads and several roads are unable to ship material sold recently. A demand for other products has brought about new quotations which are listed below.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel	$17.00 to	$17.50
Low phos., 0.04 and under	18.00 to	19.00
No. 1 railroad wrought	16.00 to	16.50
Car wheels	20.00 to	21.00
Machine shop turnings	13.00 to	14.00
Cast iron borings	15.00 to	16.00
Heavy axle turnings	14.00 to	14.50
Grate bars	14.00 to	14.50
No. 1 busheling	15.00 to	15.50
Stove plate	15.00 to	15.50
Bundled sheet stampings	11.50 to	12.00
No. 1 machinery cast	19.50 to	20.50
Hydraulic compressed	15.00 to	15.50
Railroad malleable	19.50 to	20.50

St. Louis

Pig Iron Strong—Good Demand for Structural Steel

ST. LOUIS, Sept. 12.—The market for pig iron continues strong, with Northern iron unchanged at the previous week's advance of $2 to $32, f.o.b. Chicago, while Southern iron has advanced to $25 to $27, f.o.b. Birmingham. The only sales of consequence during the week were made by a Sheffield maker, one of 500 tons, one of 350 tons and one of 150 tons for shipment by barge to Metropolis, Ill., thence by rail, and these shipments have been coming through. Other rail shipments from the Birmingham district have met with considerable difficulties in their movement northward. The sales for the most part were in small lots, melters seeming to realize the difficulties in getting orders placed and then shipped. The Granite City maker sold additional tonnage of low silicon iron during the week. Thirty days ago, it had 40,000 tons of this grade of iron in its yards; at the close of the week, it had sold all but 18,000 tons, with the prospect of the yard being completely cleaned out of it shortly. This maker is now negotiating for the sale to an Ohio melter of 750 tons of foundry iron and 750 tons of malleable. The Granite City furnace has sold its current make of foundry iron for the next 30 days. A Michigan melter wants 1000 tons of foundry iron.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago and $5.17 from Birmingham and 81 cents average switching charge from Granite City:

Northern foundry, sil. 1.75 to 2.25	$32.16
Northern malleable, sil. 1.75 to 2.25	32.16
Basic	[illegible]
Southern foundry, all rail, sil. 1.75 to 2.25	$27.17 to 29.17

Finished Iron and Steel.—There continues to be a good demand for structural steel, and one of the local fabricators has recently booked more than 10,000 tons. The E. C. Gerhard Building Co. was the low bidder on the South Side High School, St. Louis, and the contract will be signed after approval by the Board of Education this week. Inquiries continue to come in from the purchasing agents of railroads. The Missouri Pacific has asked for prices on its 1923 requirements for rails, the tonnage not being specified. The Mobile & Ohio Railroad wants 900 kegs of track spikes; the Wabash 370 kegs of track bolts, the St. Louis Southwestern 500 kegs of track bolts and 300 kegs of track spikes, and the St. Louis & San Francisco, 600 tons of structural

[illegible] The [illegible] have been [illegible] and there was an inquiry for [illegible] shapes. The stocks of steel are very small, and with the demand continuing it is felt by some men in the trade that it will not be long before the mills will be allocating material, as was done during the war. Warehouse prices have advanced.

[illegible] 3.40c. per 100 lb.; boiler rivets, 3.70c.; tank rivets, 7/16 in. and smaller, 60 per cent off list; machine bolts, large, 50 and 10 per cent; small, 50-10 and 10 per cent; carriage bolts, large, 50-5 per cent; small, 60 and 10 per cent; lag screws, 60 per cent; hot pressed nuts, square or hexagon blank, $3.50; and tapped, $3.25 off list.

Coke.—The market for coke is even stronger than last week, due to the increasing demand and limited sources of supply. The Terre Haute and Indianapolis by-product producers are out of the market, and other territories are looking more and more to St. Louis for their supplies. There is one inquiry for 50 carloads of foundry coke from an Ohio user. The Granite City by-product foundry coke is selling at $12 f.o.b. furnace, and domestic coke at $10.50. Very little Southern coke is getting through because of the railroad congestion.

Old Material.—The market for old material shows added strength. Very little material is coming in, the first railroad list in two months coming from the Louisville & Nashville Railroad, being about 300 tons that had been loaded onto cars before the strikes. The mills here are in the market for considerable tonnage, especially for melting grades, but dealers are not eager to sell at present prices.

We quote dealers' prices f.o.b. consumers' works, St. Louis and local district and dealers' yards, as follows:

[illegible]	$[illegible] to $18.75
Rails for rolling	19.00 to 19.50
Steel rails, less than 3 ft.	17.50 to 18.00
Relaying rails, standard section	26.00 to 29.00
[illegible]	[illegible] to [illegible]
No. 1 heavy railroad melting steel	17.50 to 18.00
[illegible]	[illegible] to [illegible]
[illegible]	[illegible] to [illegible]
Scrap, axletrees and forgings not [illegible]	16.50 to 17.00
[illegible]	
Heavy [illegible]	[illegible] to [illegible]
Steel angle bars	[illegible] to 18.25
Iron car axles	[illegible] to [illegible]
Steel car axles	[illegible] to [illegible]
Wrought iron bars and [illegible]	[illegible] to [illegible]
No. 1 railroad wrought	[illegible] to [illegible]
No. 2 railroad wrought	[illegible] to [illegible]
Railroad springs	[illegible] to [illegible]
Steel [illegible] and [illegible]	[illegible] to [illegible]
Cast iron borings	11.00 to 11.50
No. 1 busheling	13.00 to 13.50
No. 1 railroad cast	19.50 to 20.00
Railroad malleable	15.50 to 16.00
Machine shop turnings	9.50 to 10.00

Cleveland

Four Blast Furnaces Added to Active List—Easier Conditions Expected

CLEVELAND, Sept. 12.—The fuel situation is growing somewhat easier and as the result three additional furnaces are being placed in blast in this territory. The Trumbull Steel Co., Warren, Ohio, resumed the operation of its blast furnace to-day, the Otis Steel Co. has re-lighted one Cleveland stack and will resume making iron to-morrow, and Pickands Mather & Co., Cleveland, blew in a Toledo stack Sept. 8. Both Toledo furnaces are now in blast. The one just started up has been shut down for a number of months. In all, four furnaces have been added to the active list in this territory since the fuel situation began to improve. However, the improvement applies only to furnaces using by-product coke. Furnaces using beehive coke are waiting for lower fuel costs, not being willing to start up on $11 contract coke. Furnaces that use coking coal from West Virginia and Kentucky report that with bad transportation facilities and priority orders for lake coal their fuel shipments from these districts are not improving.

Owing to the increase in plant operations, due to the easing up of the fuel situation, steel for early shipment has become somewhat more plentiful. Various embargoes are in effect on a number of railroads and these are interfering with pig iron shipments from several furnaces. However, railroads are handling steel shipments fairly promptly, except to points south of the Ohio River. Owing to a scarcity of box cars, sheet mills are shipping their products in open top cars.

Pig Iron.—The blowing in of additional merchant furnaces is expected to result shortly in the easing up of the pig iron situation. One lake furnace that placed a stack in blast during the week is again booking orders for delivery over the remainder of the year. Another lake producer that has started up a furnace has no iron to offer from this stack during the remainder of the year, but will be able to make shipments on existing contracts. The market is dull but very firm. A Cleveland producer has again advanced prices $1 per ton to $36 for foundry grades and has taken a few small lot orders at that price. This producer has sold some foundry iron in small lots at $35, Cleveland, for Pittsburgh district delivery, or equivalent to $36.60, Valley. One lake furnace interest is quoting foundry iron at $32 to $33, depending on the location, and reports sales aggregating 2500 tons in lots of 500 tons and under at [illegible] One eastern Ohio consumer was able to buy foundry iron at $35.50 furnace, but the freight rate brought it around to about $38.50, Valley base. Southern Ohio iron is still being offered in this market at $32 to $33. Considerable pig iron inquiry is coming from far extended points, as far as Maine and Minnesota. Low phosphorus iron continues fairly active. A Valley interest during the week sold several lots aggregating 1200 tons at $38. One Ohio silvery manufacturer has made a $4 advance to $41.50 for 8 per cent. This now seems to be the price commonly named by silvery producers.

Quotations below are f.o.b. local furnaces for [illegible] freight rate [illegible] quotations except basic and low phosphorus are for [illegible] $36 [illegible]

Basic, Valley furnace, nominal	$[illegible]
Northern No. 2 fdy., sil. 1.75 to 2.25	$36.00 to $36.00
Southern fdy., sil. 1.75 to 2.25	31.00
Malleable	[illegible]
[illegible] nom., sil. 3 per cent	[illegible]
[illegible] Valley furnace	[illegible]

Iron Ore.—The effect of the coal and railroad strikes on the iron and steel industry will be reflected in a falling off in iron ore shipments this month. The Pittsburgh Steamship Co. is laying up all of its barges this week, and some steamers will go out of commission. Some independent consumers have asked shippers to defer deliveries on contracts until next year. With coal moving in better volume, the ore supply for ore is now becoming short, as many cars are sent back empty to the coal mines. Both ore docks and furnace yards generally are well filled with ore and available dock space is becoming small. The amount of ore on dock increased over 600,000 tons during August. The amount on lower Lake docks Sept. 1 was 8,084,101 gross tons as compared with 9,226,308 tons on the same date a year ago. Receipts at Lake Erie ports during August amounted to 8,621,735 tons and for the season till Sept. 1 12,671,619 tons. Shipments from these ports during the month were 4,204,511 tons and for the season until Sept. 1, 13,129,500 tons.

We quote delivered lower lake ports, Old range Bessemer [illegible] 55 per cent iron, $[illegible]; Old range non-Bessemer [illegible] per ton; Mesabi Bessemer [illegible] per ton; Mesabi non-Bessemer 51.5 per cent iron, $[illegible].

Bolts, Nuts and Rivets.—Jobbers and implement manufacturers are placing orders freely for bolts and nuts and specifications on old contracts are fairly heavy. Prices are firm at the advance and while manufacturers are not eager to book orders for extended deliveries, some are taking fourth quarter contracts at the present prices. Rivet specifications on third quarter contracts placed at the old prices are heavy and small miscellaneous lot sales are reported at the higher prices now prevailing. While 65 per cent off list is being quoted on small rivets, the 65 and 5 per cent discount has not disappeared.

Semi-Finished Steel.—There is considerable inquiry for sheet bars, billets and slabs, for prompt shipment and fourth quarter, but the supply is very limited. We note the sale of about 1000 tons of billets by a local mill at $40.

Finished Iron and Steel.—Two or three independent mills that had been out of the market but have increased operations are now taking orders for steel bars, plates and structural material and are making better delivery promises. Mills that can make shipments in 30 to 60 days are getting a fair volume of orders, but buying for more extended deliveries has fallen off. There is apparently a disposition among buyers to place orders for only what they need for early requirements, evidently expecting that with an increase in the supply of steel some of the premium prices will disappear and the market will settle down to around the present minimum prices. The market continues firm with little change in the price situation. Quotations of steel bars range from 1.90c. to 2.25c., but sellers do not appear able to get the maximum price except for prompt shipment. Plate quotations by independent mills range from 2.25c. to 2.50c. While the lower quotation is more common, some of the mills are taking a few small lot orders at the higher price. On structural material the minimum quotation is around 2c. On hoops and bands, 2.75c. now appears to be the minimum price. While hot-rolled strip steel is commonly quoted at 2.75c., the 2.60c. price has not disappeared. At least one independent mill has advanced its price on nails to 2.75c. and on plain wire to 2.50c. The higher steel prices evidently have checked building work in this city, as several contracts that have been pending have not been placed, and new inquiries are light. However, local fabricators are figuring on considerable new work in other districts.

Jobbers quote steel bars, 2.81c.; plates and structural shapes, 2.91c.; No. 9 galvanized wire, 3c., No. 9 annealed wire, 2.50c.; No. 28 black sheets, 4.25c.; No. 28 galvanized sheets, 5.25c.; No. 10 blue annealed sheets, 3.50c. to 3.61c.; hoops and bands, 3.61c.; cold-rolled rounds, 3.60c.; flats, squares and hexagons, 4.10c.

Sheets.—The Ford Motor Co. has released a portion of the sheets that it held up recently when it announced that its plant would shut down Sept. 16. These sheets are shipped directly to the companies making car frames and other parts. The demand for sheets continues fair, although there has been some slowing down in orders from automobile manufacturers. The market is firm. Minimum quotations by independent mills are 3.50c. for black, 4.50c. for galvanized and 2.60c. for blue annealed.

Reinforcing Bars.—The demand for reinforcing bars continues active. An inquiry is pending for 3000 tons of mild steel bars for the Conners Creek sewer, Detroit, and as early shipment is desired, the order may be divided among several mills. Among new inquiries is one for 1100 tons for a filtration plant in Bay City, Mich., and another for 500 tons for the Tecumseh Storage Building, Toledo, Ohio. Hard steel bars are firm at 2c.

Coke.—Connellsville foundry coke has become more plentiful and the price has declined $1.50 per ton to $13. The supply is sufficient to meet the current demond, which is light.

Old Material.—With an increase in the consumption of steel making scrap, a scarcity due partly to the limited offering by the railroads and the difficulty in moving scrap because of transportation conditions, prices on many of the grades have further advanced 50c. to $1 per ton. Locally the activity is almost wholly due to purchases by dealers to cover old orders for the McKinney Steel Co. Dealers have bid scrap prices up to a higher point than mills may be willing to pay and believe there will be further advances. As high as $19.25 has been paid by a dealer for heavy melting steel delivered to a Cleveland consumer, but this price appears to be about 50c. a ton higher than the prevailing market price. The high price of pig iron has resulted in a further advance of various grades of cast scrap. A sale of steel car wheels is reported at $20.50 delivered, at the northern Ohio steel plant

We quote per gross ton, f.o.b. Cleveland, as follow:

Heavy melting steel	$17.75 to $18.25
Steel rails under 3 ft.	18.00 to 18.50
Steel rails for rolling	18.50 to 19.00
Iron rails	16.00 to 17.00
Iron car axles	21.00 to 22.00
Low phosphorous melting	18.00 to 18.25
Cast borings	13.50 to 14.00
Machine shop turnings	13.25 to 13.50
Mixed borings and short turnings	13.75 to 14.00
Compressed steel	16.00 to 16.25
Railroad wrought	16.00 to 17.00
Railroad malleable	18.00 to 18.50
Light bundled sheet stampings	12.00 to 12.50
Steel axle turnings	15.00 to 15.25
No. 1 cast	20.00 to 20.50
No. 1 busheling	13.00 to 13.25
Drop forge flashings over 10 in	12.25 to 12.50
Drop forge flashings under 10 in	13.25 to 13.50
Railroad grate bars	16.00 to 16.50
Stove plate	16.00 to 16.50
Pipes and flues	13.50 to 14.00

Philadelphia

Easier Situation in Iron and Steel Markets Pig Iron Lower

Increasing operations at western and eastern Pennsylvania steel plants and blast furnaces have brought about an easier situation in finished steel and pig iron within the past week. The Bethlehem Steel Co. has put four furnaces in blast, now having 10 active stacks. The Midvale Steel & Ordnance Co. put one furnace in blast at Johnstown, now having four active there, and blew in a stack at Coatesville to-day. The Coatesville plate mill, which has been operated at a very low rate for many months, will now increase output as rapidly as business will permit. Steel is being offered more freely for early delivery, but prices show no change downward, and there have been some belated advances. With its increase in active furnaces, the Bethlehem Steel Co. has again become a seller of foundry and basic pig iron and is offering contracts over the remainder of the year.

The price situation is decidedly mixed. Bars and shapes are offering by various mills at prices ranging from 2c. to 2.25c., Pittsburgh, while on plates there is a spread of $8 a ton, 2.10c. being the minimum and 2.50c., Pittsburgh, the maximum. Tin plate is firm at $4.75 and may be advanced; sheets are firm at 2.60c., 3.50c. and 4.50c. for blue annealed, black and galvanized, respectively, and may go higher, some mills already quoting 2.75c. on blue annealed. Bar iron has been advanced by Eastern makers from 2.10c. to 2.25c., Pittsburgh, for carload lots. Wire products have been advanced $3 a ton by nearly all independent mills. Light rails have been sold freely since the reopening of the coal mines at 2.25c., Pittsburgh, an advance of $5 a ton. In semi-finished steel there is marked strength, as high as $50 having been received for forging billets and $47.50 has been paid for wire rods.

Opening its books for fourth quarter, an Eastern pig iron producer has offered No. 2 plain at $32, No. 2X at $33 and No. 1X at $34, f.o.b. furnace, these prices being lower than the emergency quotations which have prevailed in the past two weeks. Basic is offered at $30, furnace.

Pig Iron.—The most interesting development of the week is the announcement of a leading Eastern producer of pig iron that it will take orders for delivery over the remainder of the year at $32 for No. 2 plain, $33 for No. 2X and $34 for No. 1X, f.o.b. furnace. This producer has been out of the foundry iron market for some time due to the shortage of coal and coke. Two other merchant producers which are active sellers have made no change in their prices and are quoting $34 for No. 2 plain, $35 for No. 2X and $37 for No. 1X. Another interesting development is the announcement that the Virginia Iron, Coal & Coke Co. will put a furnace in blast shortly and sales for fourth quarter are authorized at $32 for No. 2 plain, $33 for No. 2X, and $34 for No. 1X, f.o.b. furnace, with a freight rate

of $5.17 to Philadelphia. This will be the first blast furnace operation in Virginia since October, 1921. Except for some increases at steel plant blast furnaces there has been no addition to active furnaces. The Robesonia stack has been added to the idle list because of coke shortage. Current sales of foundry pig iron are largely foreign grades, which are now being sold at prices ranging from $26 to $28 for Continental; $26 to $30 for English, and $31 to $34 for Scotch, all f.o.b. cars, Philadelphia. The variation in price is due to differences in analysis. Receipts at this port are now fairly heavy, but most of the iron coming in has already been sold and is being unloaded from ship on cars and dispatched immediately. Including that arriving this week, upward of 30,000 tons will reach Atlantic ports within the next three weeks. One broker has contracted for iron for shipment as late as next December and has about 10,000 tons of Scotch iron and smaller quantities of English and Continental iron still unsold. The largest lot sold to any one foundry is 5000 tons. Some foundries which have used foreign iron experimentally have had very successful results and have entered orders for larger tonnages than were first bought. Pig iron inquiries for fourth quarter are coming into the market more freely, the tonnages asked for usually ranging from 500 to 1000 tons. There is no demand for basic iron, which is to be had from one furnace company at $30, furnace, while another asks $33, furnace. Malleable iron is available at $33, furnace. Copper bearing low phosphorous iron is quoted at $37 to $38, furnace.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia, and include freight rates varying from 76 cents to $1.64 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$33.64 to $35.64
East. Pa. No. 2X, 2.25 to 2.75	34.64 to 36.64
East. Pa. No. 1X	35.64 to 37.64
Virginia No. 2 plain, 1.75 to 2.25 sil.	37.17
Virginia No. 2X, 2.25 to 2.75 sil.	38.17
Basic delivered eastern Pa.	32.00 to 34.00
Gray forge	31.00 to 33.00
Malleable	35.00 to 36.00
Standard low phos. (f.o.b. furnace)	38.00 to 40.00
Copper bearing low phos. (f.o.b. furnace)	37.00 to 38.00

Semi-Finished Steel.—One company is still quoting $40 on open-hearth re-rolling billets and $45 on forging billets, Pittsburgh, but sales have been made by other producers at higher prices, $47.50 and $50, Pittsburgh, having been paid for forging billets. It is doubtful whether wire rods can now be obtained for early delivery at $45, which is the nominal quotation of some makers; sales have been made at $47.50, Pittsburgh.

Light Rails.—Re-opening of the coal mines has brought a renewed demand for light rails, which one large independent producer is selling from stock at 2.25c., Pittsburgh. Another producer still quotes 2c., but this is for deferred delivery.

Plates.—The wide spread in plate prices is one of the anomalies of the present steel situation. The lowest quotation is 2.10c. and the highest 2.50c., Pittsburgh, a difference of $8 a ton, and a peculiar thing is that business is being done at both levels, and also at 2.25c., Pittsburgh, which other mills are quoting. Three of the Eastern mills are quoting 2.50c. The volume of business is not large, but the mills have orders on their books ranging from a few weeks to two or three months' work. The Midvale Steel & Ordnance Co., which has been operating its Coatesville plate mill at low ebb for some months, is now willing to sell freely and will increase operations at Coatesville as rapidly as possible. A blast furnace there was blown in to-day. The Baldwin Locomotive Works will require about 1500 to 1800 tons of plates for 50 locomotives for the St. Louis & San Francisco Railroad.

Structural Material.—A Pittsburgh mill is offering shapes at 2c., Pittsburgh, but the sizes offered are mostly those from its 28-in. mill. Eastern mills are asking at least 2.25c., Pittsburgh, and one or two, which have little to sell, quote still higher. The largest job in the market is the addition to the Girard Trust Co. building, which will require about 1200 tons.

Bars.—Eastern makers of bar iron have advanced prices to 2.25c., Pittsburgh, for car-load lots and 2.50c. for less than car-loads. Advancing prices of scrap are a factor in this advance. Steel bars are generally quoted at 2.25c., Pittsburgh, but one Pittsburgh mill is offering bars at 2c. A local firm has imported 500 tons of Belgian bars of small sizes, which are being offered at a price equivalent to 1.90c., Pittsburgh.

Sheets, Strip Steel and Tin Plate.—An Eastern maker of blue annealed sheets has advanced its price $3 a ton to 2.75c., Pittsburgh. While other makers quote 2.60c., it is stated that a general advance by independents is probable. Black sheets are quoted at 3.50c. and galvanized at 4.50c., Pittsburgh, for early delivery and mills are not desirous of making fourth quarter contracts at this time. Cold rolled strip steel is firm at 4.25c. and hot rolled, except narrow bands, is quoted at 2.75c., Pittsburgh. Narrow bands are quoted at 3c. Tin plate is firm at $4.75 per base box and although business is limited an advance is predicted.

Warehouse Business.—Local warehouses have advanced prices all along the line about $2 a ton. Business continues in fair volume. We quote for Philadelphia delivery as follows:

Soft steel bars and small shapes, 2.90c.; iron bars (except bands), 2.90c.; round edge iron, 3.10c.; round edge steel, iron finish, 1½ x ⅛ in., 3.10c.; round edge steel planished, 3.85c.; tank steel plates, ¼-in. and heavier, 3c.; tank steel plates, 3/16-in., 3.20c.; blue annealed steel sheets, No. 10 gage, 3.85c.; black sheets, No. 28 gage, 4.60c.; galvanized sheets, No. 28 gage, 5.75c.; square twisted and deformed steel bars, 3c.; structural shapes, 3c.; diamond pattern plates, ¼-in., 4.80c.; 3/16-in., 5c.; spring steel, 4.25c.; round cold-rolled steel, 3.60c.; squares and hexagons, cold-rolled steel, 4.10c.; steel hoops, No. 13 gage and lighter, 4.10c.; steel bands, No. 12 gage to 3/16-in., inclusive, 3.70c.; rails, 2.90c.; tool steel, 8.50c.; Norway iron, 5.50c.

Coke.—Odd lots of blast furnace coke are available at prices ranging from $10 to $11, Connellsville, and foundry coke is quoted at $12 to $13, Connellsville. Supplies of coke are a little more plentiful, but the price of furnace coke is still too high to encourage furnace operators to make contracts.

Old Material.—Within the past week there has been a sharp advance in practically all grades of scrap. The advance on steel scrap has not exceeded 50c. to $1 a ton, but on some other grades there has been a rise of $2 a ton. With the settlement of the coal strike there have been increased operations at nearly all steel mills, but the coke supply has not increased rapidly enough to give these mills enough pig iron, hence most of them are seeking scrap. The railroad strike has seriously interfered with the gathering of scrap by the railroads, upon which considerable dependence must be placed during the next few months if steel mills are not to face an actual shortage of melting steel. Scrap sold by the Pennsylvania Railroad from its September list brought high prices, $21, Youngstown, for steel scrap and $21.50 for railroad wrought being examples. A Cumberland, Md., mill has paid $20 for heavy melting steel, this being the highest price steel scrap has reached in some time. Brokers are offering $21, Youngstown, for steel scrap. Johnstown, Pa., has paid $17.50 and $18, delivered.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$16.00 to $17.00
Scrap rails	16.00 to 17.00
Steel rails for rolling	17.00 to 17.50
No. 1 low phos., heavy 0.04 and under	22.00 to 24.00
Cast iron car wheels	21.00 to 22.00
No. 1 railroad wrought	21.00 to 22.00
No. 1 yard wrought	18.50 to 19.00
No. 1 forge fire	15.50 to 16.00
Bundled sheets (for steel works)	14.50 to 15.50
No. 1 busheling	13.50 to 14.50
No. 2 busheling	10.00 to 11.00
Turnings (short shoveling grade for blast furnace use)	13.50 to 14.00
Mixed borings and turnings (for blast furnace use)	13.50 to 14.00
Machine-shop turnings (for steel works use)	15.00 to 16.00
Machine-shop turnings (for rolling mill use)	15.00 to 16.00
Heavy axle turnings (or equivalent)	15.50 to 16.00
Cast borings (for steel works and rolling mills)	16.00 to 16.50
Cast borings (for chemical plants)	17.50 to 18.00
No. 1 cast	21.00 to 22.00
Heavy breakable cast (for steel plants)	19.00 to 20.00
Railroad grate bars	16.00 to 16.50
Stove plate (for steel plant use)	16.00 to 16.50
Railroad malleable	15.50 to 16.50
Wrought iron and soft steel pipes and tubes (new specifications)	15.00 to 16.00
Shafting	22.00 to 23.00

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Plates

Sheared, tank quality, base, per lb.....2.00c. to 2.50c.

Structural Material

Beams, channels, etc.....2.00c. to 2.25c.

Iron and Steel Bars

Soft steel bars, base, per lb.....1.90c. to 2.25c.
Refined iron bars, base, per lb.....2.45c.

Hot-Rolled Flats

Hoops, base, per lb.....2.75c. to 3c.
Bands, base, per lb.....2.75c. to 3c.
Strips, base, per lb.....2.75c. to 3c.
Cotton ties, per bundle of 45 lb.....$1.12

Cold-Finished Steels

Bars and shafting, base, per lb.....2.50c.
Strips, base, per lb.....4.25c.

Wire Products

Nails, base, per keg.....$2.60 to $2.75
Bright plain wire, base, per 100 lb..... 2.35 to 2.50
Annealed fence wire, base, per 100 lb..... 2.35 to 2.50
Galvanized wire, base, per 100 lb..... 2.85 to 3.00
Galvanized barbed, base, per 100 lb..... 3.15 to 3.40
Galvanized staples, base, per keg..... 3.15 to 3.40
Painted barbed wire, base, per 100 lb..... 2.65 to 2.90
Polished staples, base, per keg..... 2.65 to 2.90
Cement coated nails, base, per count keg.....2.10c. to 2.35c.
Woven fence, carloads (to jobbers).70½ to 72 per cent off list
Woven fence, carloads (to retailers).68 to 69½ per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads.60 and 10 per cent off list
Machine bolts, small, cut threads.50, 10 and 10 per cent off list
Machine bolts, larger and longer..50, 10 and 10 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads,
50, 10 and 10 per cent off list
Cut threads .....50 and 10 per cent off list
Longer and larger sizes.....50 and 10 per cent off list
Lag bolts .....60 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.:
Smaller and shorter.....45 and 10 per cent off list
Larger and longer sizes.....45 and 10 per cent off list
Hot pressed square or hex. blank nuts.....$3.75 off list
Hot pressed nuts, tapped.....3.75 off list
C.p.c. and t. sq. or hex. nuts, blank..... 3.75 off list
C.p.c. and t. sq. or hex. nuts, tapped..... 3.75 off list
Semi-finished hex. nuts:
9/16 in. and smaller, U. S. S.....80 and 10 per cent off list
⅝ in. and larger, U. S. S.....75 per cent off list
Small sizes, S. A. E.....80 and 10 per cent off list
S. A. E., ⅝ in. and larger.....75 and 10 per cent off list
Stove bolts in packages.....80 and 5 per cent off list
Stove bolts in bulk.....80, 5 and 2½ per cent off list
Tire bolts .....50, 10 and 10 per cent off list

Cap and Set Screws

Milled square and hex. head cap screws,
75 and 10 per cent off list
Milled set screws.....75 per cent off list
Upset cap screws.....80 per cent off list
Upset set screws.....80 and 5 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb.....$3.00
Large boiler rivets, base, per 100 lb..... 3.10
Small rivets .....65 to 65 and 5 per cent off list

Track Equipment

Spikes, 9/16 in. and larger, base, per 100 lb.....$2.75
Spikes, ½ in. and smaller, base, per 100 lb..... 3.25
Spikes, boat and barge, base, per 100 lb..... 3.25
Track bolts, base, per 100 lb.....$3.75 to 4.50
Tie plates, per 100 lb..... 2.25
Angle bars, base, per 100 lb..... 2.40

Welded Pipe

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛	51½	26	⅛ to ⅜.....+	1½	+27½
¼ to ⅜.....	57	31½	½	31½	13½
½	62	48½	¾	37½	22½
¾	66	54½	1 to 1½.....	39½	24½
1 to 3.....	68	56½			

Lap Weld

2	61	49½	2	34½	20½
2½ to 6.....	65	53½	2½ to 6.....	37½	24½
7 to 8.....	62	49½	7 to 12.....	35½	22½
9 to 12.....	61	48½			

Butt Weld, extra strong, plain ends

⅛	47½	31	⅛ to ⅜.....+	9½	+42½
¼ to ⅜.....	53	36½	½	30½	18½
½	59	48½	¾	37½	23½
¾	64	53½	1 to 1½.....	39½	25½
1 to 1½.....	66	55½			
2 to 3.....	67	56½			

Lap Weld extra strong, plain ends

2	59	48½	2	35½	22½
2½ to 4.....	63	52½	2½ to 4.....	38½	26½
4½ to 6.....	62	51½	4½ to 6.....	37½	25½
7 to 8.....	58	45½	7 to 8.....	30½	18½
9 to 12.....	52	39½	9 to 12.....	25½	13½

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 and 2½ per cent.

Boiler Tubes

Lap Welded Steel		*Charcoal Iron*	
1¾ in.	23½	1½ in. .....+	2
2 to 2¼ in.....	38	1¾ to 1⅞ in.....	8
2½ to 3 in.....	49	2 to 2¼ in.....	18
3¼ to 13 in.....	54	2½ to 3 in.....	23
		3¼ to 4½ in.....	25

To large buyers of steel tubes a supplementary discount of 5 per cent is allowed.

Standard Commercial Seamless Boiler Tubes

Discounts on cold-drawn tubes in carload lots, f.o.b. Pittsburgh, follow:

1 in.	57	2½ and 2¾ in.....	40
1¼ and 1½ in.....	49	3 in.	44
1¾ in.	33	3¼ to 4 in.....	49
2 and 2¼ in.....	36	4¼ in. and 5 in.....	41

Hot Rolled

3 in.	46	3¼ to 4 in.....	51

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30, base, 85 per cent off list. Carbon 0.30 to 0.40, base, 83 per cent off list. Plus usual differentials and extras for cutting.

Seamless Locomotive and Superheater Tubes

	Cents per Ft.		Cents per Ft.
2-in. O.D. 12 gage.....	13	2¼-in. O.D. 10 gage....	17¾
2-in. O.D. 11 gage.....	14	3-in. O.D. 7 gage.....	33
2-in. O.D. 10 gage.....	15	1½-in. O.D. 9 gage.....	13
2¼-in. O.D. 12 gage....	15	5⅜-in. O.D. 9 gage.....	51
2¼-in. O.D. 11 gage....	16	5½-in. O.D. 9 gage.....	53

Tin Plate

Standard cokes, per base box.....$4.75

Terne Plate

(Per package, 200-lb.)

8-lb. coating	$9.30	25-lb. coating I. C.....$14.25	
8-lb. coating I. C.....	9.60	30-lb. coating I. C.....	15.25
15-lb. coating I. C.....	11.80	35-lb. coating I. C.....	16.25
20-lb. coating I. C.....	13.00	40-lb. coating I. C.....	17.25

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....2.50c. to 2.75c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.35c. to 3.75c.

Galvanized

No. 28 (base), per lb.....4.35c. to 4.75c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.35c. to 3.50c.

Manufacturers have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic.	$0.325	Buffalo	$0.265	St. Louis	$0.43
Philadelphia, export...	0.235	Cleveland	0.215	Kansas City	0.735
Baltimore, domestic...	0.315	Cleveland, Youngstown		Kansas City (pipe)....	0.705
Baltimore, export.....	0.225	Comb.	0.19	St. Paul	0.595
New York, domestic...	0.34	Detroit	0.295	Omaha	0.735
New York, export.....	0.255	Cincinnati	0.295	Omaha (pipe)	0.705
Boston, domestic	0.365	Indianapolis	0.31	Denver	1.275
Boston, export	0.255	Chicago	0.34	Denver (pipe)	1.215
				Pacific Coast	$1.50
				Pac. Coast, ship plates	1.20
				Birmingham	0.69
				Memphis	0.385
				Jacksonville, all rail..	0.50
				Jacksonville, rail and water	0.415
				New Orleans	0.515

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 30c. to 40c.; ship plates, 30c. to 40c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 30c. to 40c.; sheets and tin plates, 50c.; rods, wire rope, cable and strands, 75c.; wire fencing, netting and stretcher, 50c.; pipe, not over 8 in. in diameter, 50c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

RAILROAD EQUIPMENT BUYING

About 1000 Cars Bought and as Many Fresh Inquiries

The Great Northern Railroad has asked for prices on 100 tank cars for fuel oil.

The Pittsburgh, Shawmut & Northern Railroad is inquiring for 200 stock and 50 box cars and 150 to 200 stock car bodies.

The Central Railroad of Georgia has placed an order with the Virginia Bridge & Iron Works for 100 flat cars.

The St. Louis & San Francisco Railroad has let 500 hopper bodies to the American Car & Foundry Co. in addition to the 500 reported two weeks ago.

The Atlantic Coast Line is inquiring for 2000 steel underframe box cars of 40 tons capacity.

The Pacific Electric has awarded 220 dump cars to the American Car & Foundry Co.

The Western Pacific is in the market for 100 gondola cars.

The Great Northern is inquiring for 100 tank cars.

The Texas & Pacific has ordered 150 10,000-gal. tank cars from the American Car & Foundry Co.

The Union Pacific has revived an inquiry for 50 caboose cars.

The New York Central system has awarded repairs on 11,000 cars to various builders.

The Elgin, Joliet & Eastern is inquiring for 200 steel gondola cars of 50 tons capacity.

The Peoria & Pekin has placed 6 switch engines with the Lima Locomotive Co.

New York, New Haven & Hartford is inquiring for 10 mountain type engines.

The Texas & Pacific is in the market for 8 Pacific type locomotives.

The St. Louis & San Francisco Railroad has ordered 50 locomotives from the Baldwin Locomotive Works.

FABRICATED STEEL BUSINESS

Shipbuilding Company Gets Large New York Hotel Job—Other Awards

Among the fabricated steel awards of the past week are the following:

An apartment hotel at 299 Park Avenue, New York, 4000 to 5000 tons, to New York Shipbuilding Corporation. Erroneously reported last week as the new Roosevelt Hotel to be built by the United Hotels Co. The latter job, which requires about 5000 tons, is still in the market.

Highway bridge over Passaic River at Paterson, N. J., 400 tons, to Phoenix Bridge Co.

Warehouse for Butler Brothers at Long Island City, 1800 tons, to Levering & Garrigues Co.

Addition to store of Oppenheim, Collins & Co., New York, 250 tons, to Hay Foundry & Iron Works.

Hotel at Manhattan Beach, New York, 400 tons, to Paterson Bridge Co.

Apartment house on West Ninety-fifth Street, New York, 300 tons, to Hedden Iron Construction Co.

Apartment hotel at Park Avenue and Thirty-seventh Street, New York, 650 tons, to Hedden Iron Construction Co.

Cornelia Copper Co., smelter, Ajo, Ariz., 2100 tons, to Wisconsin Bridge & Iron Co.

Robinson Building, Los Angeles, Cal., 2500 tons, to Llewellyn Iron Works.

Three 55,000-bbl. storage tanks, Crockett, Cal., for California Hawaiian Sugar Refining Co., 663 tons, to Pittsburgh Des Moines Steel Co.

Six ordnance buildings for United States Navy, Pearl Harbor, Hawaii, 300 tons, to American Bridge Co.

Allis Chalmers Mfg. Co., West Allis, Wis., plant addition, 250 tons, to Milwaukee Bridge Co.

Power house for Crossett Lumber Co., Crossett, Ark., 221 tons, to American Bridge Co.

Bridge across Bear River near Auburn, Cal., for California Highway Commission, 112 tons, to Minneapolis Steel & Machinery Co.

Crane runways for Richmand, Fredericksburg & Potomac Railroad, 130 tons, to unnamed fabricator.

Mayo Building, Tulsa, Okla., 2000 tons, to Mississippi Valley Structural Steel Co.

Warehouse and storage hopper bottoms for Fred Uhlman, Kansas City, Mo., 124 tons, to unnamed fabricator.

Harrisburg (Ill.) Bank, 70 tons, to Mississippi Valley Structural Steel Co.

Agey & Stead Building, Centralia, Ill., 61 tons, to Mississippi Valley Structural Steel Co.

Structural Projects Pending

Inquiries for structural steel work now being figured on include the following:

Addition to Chelsea Hotel, Atlantic City, 500 tons.

Addition to the Girard Trust Co.'s building, Philadelphia, 1200 tons.

Apartment house on East Forty-eighth Street, New York, 700 tons.

Addition to American Museum of Natural History, New York, 900 tons, James Stewart & Co., low bidder on general contract.

Kalan Bridge over Columbia River for Union Pacific System, 2800 tons, American Bridge Co. low bidder.

Pennsylvania Railroad, grade crossing elimination in New Jersey, 1100 tons.

Bridge in Clarksville, Tenn., 500 tons.

Missouri Pacific Railroad, bridge, 300 tons.

Fair ground grandstand, Russell, Ky., 1000 tons.

Denison University, chapel, Granville, Ohio, 125 tons.

Oxford University, dormitory, Miami, Ohio, 200 tons.

Highway bridge in Tennessee, 500 tons, bids being taken.

Highway bridge, Montgomery Co., Ohio, approximately 600 tons, bids in.

Highway bridge, Hamilton Co., Ohio, 300 tons, bids close Oct. 6.

Bascule bridge, Los Angeles, Cal., 2200 tons.

PACIFIC STEEL CORPORATION

Three Companies Merged—To Build Furnace and Steel Plant

SAN FRANCISCO, Sept. 12.—Filing of articles of incorporation in Delaware Sept. 6 discloses the formation of another large steel group for the Pacific Coast, to be known as the Pacific Steel Corporation. It is capitalized at $20,000,000 preferred stock and 200,000 shares of no par common. The corporation comprises the Pacific Coast Steel Co., San Francisco, Seattle and Portland; the Southern California Iron & Steel Co., Los Angeles, and the Milner Corporation, Salt Lake City, to which possibly will be added the Judson Mfg. Co., Oakland.

It is proposed to manufacture steel products by utilizing the resources of Utah, and extensive iron ore deposits have been acquired, along with coal holdings producing 750,000 tons yearly near the Utah Fuel Co. mines in Carbon County. A blast furnace plant in Utah is to be erected as soon as possible. T. T. C. Gregory, of San Francisco, the lawyer making arrangements, is expected to return from the East to-day.

Railroad Inquiries for 116 Tools

CINCINNATI, Sept. 12.—The Missouri, Kansas & Texas Railroad has issued a list of approximately a half million dollars' worth of machine shop equipment for Bellmead, Tex., shops. The list includes 30 lathes, six planers, six radial drills, six crank shapers, two boring mills, two carwheel lathes, five turret lathes, three grinders, five milling machines, besides shears, bulldozers, box lathes, bolt cutters, pipe threaders and other miscellaneous equipment, all machines to be motor driven with push button control. The list comprises 116 separate classifications.

To get out the large orders booked for castings for locomotives and other equipment the Ohio Steel Foundry Co., Springfield, Ohio, is working longer hours and has increased its force. Part of the force is working ten hours and others 12 hours a day.

NON-FERROUS METALS

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
Sept.	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
6	14.12½	13.75	32.30	5.95	5.60	6.57½	6.22½
7	14.12½	13.75	32.37½	5.95	5.60	6.57½	6.22½
8	14.12½	13.75	32.25	5.95	5.60	6.60	6.25
9	14.12½	13.75	....	5.95	5.60	6.65	6.30
11	14.12½	13.75	32.25	5.95	5.60	6.70	6.35
12	14.12½	13.75	32.12½	5.95	5.60	6.72½	6.37½

*Refinery quotation.

New York

NEW YORK, Sept. 12.

Sentiment in all the markets is optimistic and the price tendency is upward. Buying of copper is better, but the tin market has been dull. Although the lead market is quiet prices are a little higher. The indication in zinc points to a scarcity and prices are advancing.

Copper.—Buying in electrolytic copper since the holidays has increased and some substantial orders have been booked at 14c., delivered, or 13.75c., refinery, which is the minimum, any cheaper lots no longer being available. There is also a good inquiry and specifications on contract are also liberal. Some sellers are unwilling to sell at these levels and ask about ⅛c. higher. Lake copper is unchanged at 14c. to 14.25c., delivered.

Tin.—With the exception of one day, Sept. 6, the market has been without feature and stagnant and prices have been largely nominal. On that day about 200 tons of Straits tin was sold at a range of 32.25c. to 32.37½c. Prices have hovered close to 32.25c. each day and to-day the quotation is 32.12½c., New York, for spot Straits. Late to-day fairly liberal sales were made. There has also been very little change in the London market, quotations to-day being £158 12s. 6d. for spot standard, £159 10s. for future standard and £159 per ton for spot Straits, all very close to the quotations a week ago. The British market is also without feature. Arrivals thus far this month have been 2510 tons, with 6815 tons reported afloat.

Lead.—A moderate business is reported booked daily for September shipment, but the market is generally quiet and without feature. The rush which characterized this market last month is absent. The possibility of a duty on lead in the new tariff bill, if enacted soon, is having some effect because considerable of the metal and the ore is imported from Mexico. Prices in the outside market have stiffened a little to 5.95c., New York, or 5.60c., St. Louis, with those of the leading interest unchanged at 5.90c., New York, and 5.70c., St. Louis.

Zinc.—A sharp rise in the quotations for prime Western has been established by sales in the last two days. For early delivery sales were made on Saturday at 6.30c., St. Louis, and on Monday at 6.35c., St. Louis, the advance being due to peculiar conditions existing in the market and indicating a possible shortage of the metal. Consumption has been curtailed in the West, due to lack of coal or inability of the railroads to handle the ore and also to scarcity of labor. Some companies would like to increase their output but are unable to do so. These conditions are also attended by a better demand since the practical settlement of the strike and there is also a prospect that there may be a scarcity of the metal in England. Should there develop any demand from that source, this would accentuate the conditions referred to. We quote prime Western for early delivery at 6.35c. to 6.40c., St. Louis, and 6.70c. to 6.75c., New York.

Antimony.—The prospect of an early duty on antimony and the lack of offerings from China have increased values in this market. Wholesale lots for early delivery are quoted to-day at 6.25c. per lb., New York, duty paid. It is interesting to note that the imports of antimony for the first eight months of this year are only 5308 gross tons, as compared with 7677 tons and 9238 tons in the same months of 1921 and 1920, respectively.

Aluminum.—Wholesale lots of virgin metal, 98 to 99 per cent pure, for early delivery, are quoted by the leading interest at 19.10c. per lb., f.o.b. plant, with the same grade made by foreign producers offered by importers at 17.75c. to 18c. per lb., duty paid, New York.

Old Metals.—The market is firmer but there has been practically no change in values. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	13.50
Copper, heavy and wire	12.75
Copper, light and bottoms	11.25
Heavy machine composition	10.50
Brass, heavy	8.25
Brass, light	6.50
No. 1 red brass or composition turnings	9.00
No. 1 yellow rod brass turnings	7.50
Lead, heavy	5.00
Lead, tea	4.00
Zinc	3.75

Chicago

SEPT. 12.—The metals remain quiet with lead spelter and antimony slightly higher than a week ago. The old metals remain unchanged. We quote, in carload lots, lake copper, 14.25c.; tin, 33.50c. to 34c.; lead, 5.70c.; spelter, 6.40c.; antimony, 7.50c., in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 11c.; copper bottoms, 9.25c.; red brass, 8.75c.; yellow brass, 6.75c.; lead pipe, 4.50c.; zinc, 3.75c.; pewter, No. 1, 20c., tin foil, 22.50c.; block tin, 26c., all buying prices for less than carload lots.

St. Louis

SEPT. 12.—The lead market was steady for the week at 5.60c. to 5.65c., car lots, against 5.60c. the previous week, while slab zinc held steady at 6.25c. On old material we quote: Light brass, 3.50c.; heavy red brass, and light copper, 7c.; heavy yellow brass, 4c.; heavy copper nad copper wire, 7.50c.; zinc, 2c.; lead, 3c.; pewter, 15c.; tin foil, 16c.; tea lead, 2c.; aluminum, 9c.

American Low Bidder on Bridge in Uruguay

WASHINGTON, Sept. 12.—Submitting a figure of 621,000 Uruguayian gold pesos, an American fabricating interest was the lowest bidder for the construction of the Santa Lucia River bridge in Uruguay, which will require 3000 tons of steel. Announcement of the bids was made to-day in a cable received by the Department of Commerce from Commercial Attache Edward F. Feely, Buenos Aires, Argentina. The other bidders were Belgian, 700,000 pesos; Germany, 850,000, and British, 900,000.

Two of the Nagle Steel Plants Sold

The Glasgow and Seyfert plants of the Nagle Steel Co., which has been in financial difficulties, were sold at private sale last week to George H. Heck and associates, 518 Commercial Trust Building, Philadelphia, who will form a company to operate them. The Rahway and Pottstown plants of the Nagle Steel Co. have not yet been sold. The Glasgow works has an annual capacity of 20,000 tons of plates up to 84 in. and the Seyfert works is equipped to produce about the same tonnage of plates. The price paid for the two plants is reported to have been $90,000.

Wages of Sheet Mill Workers Advanced

YOUNGSTOWN, Sept. 12.—Tonnage rates of sheet mill workers operating under the sliding scale of the Amalgamated Association of Iron, Steel and Tin Workers will be advanced 4½ per cent of the base rate, for the September-October period as a result of the bimonthly examination of sales sheets, held Sept. 11 at Youngstown. The rates for tin mill employees will remain unchanged.

PERSONAL

George F. Downs, president Lackawanna Steel Co., has tendered his resignation effective upon the selection of his successor. Other and important changes in the Lackawanna organization are expected in connection with his withdrawal. Mr. Downs has been president of the Lackawanna Steel Co. since August, 1920, succeeding Charles McCullough, who died April 3, 1920. At the time of his election to the presidency, Mr. Downs was vice-president in charge of operations.

William H. Woodin, president of the American Car & Foundry Co., 165 Broadway, New York, also director of the Westinghouse Electric & Mfg. Co., General Motors Co., American Locomotive Co., and several other companies, has given over to a large extent his duties in these connections to direct his efforts to his new commission as New York State fuel administrator, to which he was appointed by Governor Miller on Sept. 6. The appointment met with general approval, and there is every reason to believe that Mr. Woodin will fulfill his promise to ration the coal equitably and in keeping with established channels of trade. In the 15 plants of the American Car & Foundry Co., Mr. Woodin is a familiar figure. He learned the business from the ground up. Some of his employees can recall the time when he cast his first wheel. Upon entering his father's employ, just after leaving the Columbia School of Mines, he was granted no exemptions. There is an ironclad rule that all officials of the company must spend three years in the works. This he did until one day he took a prize which his father offered for casting the best wheel. From this point, young Woodin left the ranks and rose gradually to president of the company as well as director of several others. Mr. Woodin is a man of genial presence, but of few words. The great responsibilities surrounding his positions are not irksome. In his room hangs a letter commending his prompt delivery of cars during the war, and telling of the resultant savings to the Government. His patriotism again bids him give up some business duties to serve in a large public capacity.

WILLIAM H. WOODIN

John A. Oartel, chief of the safety bureau, Carnegie Steel Co., will be the speaker at the regular monthly meeting of the Pittsburgh Foundrymen's Association at the General Forbes Hotel, Pittsburgh, on Monday evening, Sept. 18. His subject will be, "One Hundred Per Cent Safety in the Foundry."

A. D. Neal, formerly associated with the Duquesne Steel Foundry Co., Pittsburgh, in its roll sales department, has joined the sales force, Pittsburgh Rolls Corp., Pittsburgh. Mr. Neal, prior to joining the Duquesne Steel Foundry Co., was with the Carnegie Steel Co. at its Homestead works and in the sales department.

Colonel C. H. Crawford, South American manager of the Baldwin Locomotive Works, and Clifford Shoemaker, Washington, have been appointed representatives of the American Association of Engineers at the International Engineering Congress held this month at Rio de Janeiro. The purpose of the conference is to establish closer contact among those engaged on problems of economic progress in all the Americas.

C. T. Pratt has resigned as treasurer of the Brown Hoisting Machinery Co., Cleveland, and Alex. C. Brown, president of the company, has assumed the additional duties of treasurer. J. F. Pierce has resigned as auditor and director of the same company. This vacancy probably will not be filled for the present.

Irving S. Kemp, sales manager Vaughan & Bushnell Mfg. Co., Chicago, has resigned to become vice-president Evansville Tool Works, Evansville, Ind.

J. D. Powell, for several years with L. S. Starrett Co., Chicago, but latterly handling manufacturers' lines, has become associated with the Lufkin Rule Co., with headquarters at Saginaw, Mich.

Robert C. Yates, for many years identified with the Union Drop Forge Co., Chicago, has resigned to become general manager of the Interstate Drop Forge Co., Milwaukee. Mr. Yates, after graduating from Union College, was connected with the American Locomotive Co. at Schenectady, N. Y., and Bethlehem Steel Co. having also been manager for a time of the Chicago district office of Bethlehem. The Interstate Drop Forge Co., which was organized in 1919 for the manufacture of small commercial forgings, is closely allied with the Chain Belt Co., Sivyer Steel Casting Co. and Federal Malleable Co., all of Milwaukee.

ROBERT C. YATES

F. C. Schreiber, formerly with Stocker-Rumely-Wachs Co., machinery dealers, Chicago, but of late in the sales department of the Packard Motor Car Co., has returned to his former position with Stocker-Rumely-Wachs Co.

Mark A. Brown, general manager, J. M. Leach Mfg. Co., Kokomo, Ind., has been appointed general manager of the Globe Stove & Range Co. of the same city.

A. W. Van Buren, formerly Chicago manager of the Betts Machine Co., Rochester, N. Y., has been appointed district sales manager in the Chicago territory of the Consolidated Machine Tool Corp., New York. Charles M. Robertson, who had been Chicago manager of the Dale Machinery Co., has been appointed manager of the Chicago office of the Consolidated Machine Tool Corp.

C. E. Reese, editor of Gas Engineering and Appliance Catalog, and associate editor of *Gas Age-Record*, has joined the Stoker sales department of the Westinghouse Electric & Mfg. Co., at South Philadelphia. He was previously cadet engineer and combustion engineer with Henry L. Doherty & Co., and assistant engineer of the Illinois Public Utilities Commission. Mr. Reese is a graduate gas and electrical engineer and a member of the Editorial Conference and executive committee of the New York Business Publishers' Association, Inc.; American Gas Association, and American Institute of Electrical Engineers.

A number of changes were made recently in the organization of the United Alloy Steel Corporation, Canton, Ohio. H. C. Thomas was promoted from general superintendeent to assistant general manager; J. B. Thorpe was appointed general superintendent of the Alloy Division, and H. T. McBratney, general superintendent of the Sheet Division. Mr. Thomas and Mr. Thorpe formerly were connected with the Gary Steel Works of the U. S. Steel Corporation, the former as assistant general superintendent and the latter as open hearth superintendent, both going to the United Alloy Corporation in 1918. Mr. McBratney was for a number of years general superintendent of the sheet mills of the Allegheny Steel Co., Breckenridge, Pa.

Weaver H. Rogers, formerly vice-president and general manager the Pittsburgh Iron & Steel Foundries

Co., Pittsburgh, has organized Weaver H. Rogers & Co., with offices in the Farmers Bank Building, Pittsburgh. The company has been incorporated under the Pennsylvania laws for the purpose of acting as intermediary and in an advisory way in connection with business changes and financial matters.

B. D. Quarrie, vice-president and general manager Otis Steel Co., Cleveland, has been elected a director of the Guardian Savings & Trust Co., Cleveland.

Fay, Spofford & Thorndike, consulting engineers, 200 Devonshire St., Boston, specializing in bridges, industrial plants, commercial buildings, foundations, and port and hydraulic developments, have admitted to partnership John Ayer, Bion A. Bowman, Carroll A. Farwell, Ralph W. Horne, Ralph T. Jackson, George L. Mirick, Barzillai A. Rich and Warren D. Trask, all of whom have long been associated with the firm.

A. W. Robbins, who for the past few years has been identified with the ball bearing industry through his connections with the Standard Roller Bearing Co. and the Bearings Service Co., is now associated with the Bearings Co. of America, and will travel from the Detroit offices of that company, which are located in the Ford Building, Detroit.

OBITUARY

JOHN HALDANE FLAGLER, founder and general manager of the National Tube Co., McKeesport, Pa., died last Friday night, Sept. 8, in his home at Greenwich, Conn., at the age of 70, after a week's illness with pneumonia. Although he had virtually retired from business during the last few years, he retained the directorship of several organizations. In the field of finance and in iron and steel circles, Mr. Flagler was a prominent figure for nearly 40 years. His career began with Haldane & Co., New York, with whom he rose rapidly from clerk to manager of the Boston branch. In East Boston, the National Tube Co., had its beginning in 1868. Two years later it was moved to McKeesport where its extensive plants are now operated by the United States Steel Corporation, with which it was merged in 1901. Mr. Flagler contributed several improvements to the steel industry, among which was a new method of uniform heat treatment. He was also instrumental in the introduction of gas for furnace use. At the time of his death, Mr. Flagler had been director of the National Bank of North America and the American Union Line Insurance Co. Besides his wife he leaves a daughter, a sister and a brother, Harvey K. Flagler.

JOHN H. FLAGLER

FREDERICK W. COOKE, aged 62, for many years general manager Cooke Locomotive Works, Paterson, N. J., a subsidiary of the American Locomotive Co., died last Sunday, Sept. 3, from heart disease in his summer home, Quoque, L. I., following a brief illness. He was a graduate of Stevens Institute. His father, John Cooke, was founder of the Cooke Locomotive Works, which was sold to the International Power Co. in 1901, and in 1907 passed into the hands of the American Locomotive Co. F. W. Cooke remained general manager until he retired in 1914.

EDWARD B. RAYMOND, vice-president in charge of operations, Pittsburgh Plate Glass Co., also consulting engineer and a director, Pittsburgh Valve & Fittings Co., dropped dead in his office, Frick Building, Pittsburgh, Sept. 8. He was 53 years old and a native of Massachusetts. He was a graduate of Massachusetts Institute of Technology and was with the General Electric Co., Schenectady, N. Y., for several years.

EDWIN NEWTON OHL, whose death was reported in THE IRON AGE, Sept. 7, was born in Ohltown, Ohio, 72 years ago, but went to Sharon, Pa., more than 50 years ago and long had been a prominent figure in the iron and steel industry. In Sharon he was associated with Peter Kimberly, a pioneer steel man in that district. In the early '90's, he went to New Castle, Pa., to become associated in the steel business with A. W. Thompson, afterward president, Inland Steel Co., Chicago. When the Atlantic Iron & Steel Co., New Castle, of which Mr. Ohl and Mr. Thompson were officers, was absorbed by the Republic Iron & Steel Co., Mr. Ohl became vice-president and general manager of that company. He was one of the organizers of the Cherry Valley Iron Co., with a furnace at Leetonia, Ohio, now owned by the Hanna Furnace Co., Cleveland, of which company Mr. Ohl was a director at time of his death. He was also vice-president of the Miami Iron & Steel Co., Hamilton, Ohio, which was succeeded by the Hamilton Furnace Co. in 1917. He went to Pittsburgh about 30 years ago and made his home in that city thereafter. He was a member of the American Iron and Steel Institute and was president of the American Roller Bearing Co., Pittsburgh, a director the Keystone National Bank, Pittsburgh, of the Republic Casualty Co., of the Valley Steamship Co., and of the Amortization Mortgage Co. He is survived by Mrs. Ohl, a son, Edwin N. Ohl, Jr., a student at Harvard University, and two brothers and three sisters.

EDWIN NEWTON OHL

JOHN H. TOBIN, former vice-president, Wehr Steel Co., Milwaukee, died Aug. 23 at his summer home at Muskego Center, Wis., following an illness of several months. He was 64 years of age.

JOHN A. LEONARD, business manager of the Crane Co., Bridgeport, Conn., died at his home in Bridgeport on Sept. 2. Mr. Leonard was 50 years old, having been born in Livermore Falls, Me., Oct. 25, 1872.

JAMES W. KINNEAR, attorney and business man, Pittsburgh, died at Rochester, Minn., Sept. 8. He was president of the American Stainless Steel Co., vice-president Firth-Sterling Steel Co. and Washington Steel & Ordnance Co., also a director of the Pittsburgh Cold Rolled Steel Co. He was born in Tidioute, Pa., Aug. 2, 1850.

JOHN MILTON POTTER, treasurer Northwestern Malleable Iron Co., Milwaukee, died Sept. 6 at the age of 61 years. He was born in Elmira, N. Y., and went to Milwaukee as a youth, being connected with the Northwestern company 32 years ago.

A. N. WHEELER, president Standard Foundry & Mfg. Co., DeKalb, Ill., died Aug. 29, at the hospital at Rochelle, Ill., following an operation. Mr. Wheeler was born in New York in 1850.

The Dutch steamer Bellatrix, which brought 4700 tons of soft coal from Immingham, England, was unloaded in nineteen hours by John Grace's Sons with their ore and coal discharging plant at the Girard Point terminals on the Schuylkill, Philadelphia.

Strike of the employees of Kelly & Jones Co., Greensburg, Pa., which caused a suspension of operations has been amicably settled and the plant is again running full.

British Iron and Steel Market

American Buying of British Pig Iron Has Reduced Stocks—British Steel Prices Weakening in Face of Better Demand

(By Cable)

LONDON, ENGLAND, Sept. 12.

America continues to purchase pig iron from British makers, with the result that stocks are decreasing and prices firm. Cleveland producers have relighted two more furnaces. Scotch producers are contemplating restarting others. Prompt supplies are scarce and most makers are now quoting for November shipment.

There is improved demand for hematite on spasmodic Continental sales. Quotations are firm.

Demand for finished steel is improving. Northeastern ship repair plants are getting orders, but price concessions still are necessary in most cases.

British Mannesmann [seamless rolled] tube makers have secured large orders for oil pipe lines in Burma.

British iron and steel exports for August totaled 269,983 tons.

Continental iron and steel is quiet, with India and China the chief purchasers, but only in moderate parcels. Few Belgian works are able to offer merchant bars before November or December delivery.

Tin plate is quiet but steady. Recent oil plate orders now total 500,000 boxes [first reported at 250,000 boxes; last week increased to 350,000]. Canada has made small purchases. The Far East is quiet.

Galvanized sheets are quiet but there are signs of improving inquiry.

We quote per gross ton, except where otherwise stated, f.o.b. maker's works, with American equivalent figured at $4.46 per £1, as follows:

Durham coke, delivered	£1	6½s.	to £1	7s.		$5.91	to	$6.02
Cleveland No. 1 foundry	4	17½				21.74		
Cleveland No. 3 foundry	4	10				20.07		
Cleveland No. 4 foundry	4	7½				19.51		
Cleveland No. 4 forge	4	5				18.95		
Cleveland basic	4	0				17.84		
East Coast mixed	4	9	to	4	11½	19.85	to	20.40
Ferromanganese	15	0				66.90		
Ferromanganese*	14	10	to	14	15	64.67	to	65.78
Rails, 60 lb. and up	7	5	to	8	0	32.33	to	35.68
Billets	7	2½	to	8	0	31.78	to	35.68
Sheet and tin plate bars, Welsh	7	7½				32.89		
Tin plates, base box	0	19¼	to	0	19⅜	4.26	to	4.32
						C. per Lb.		
Ship plates	8	15	to	9	5	1.74	to	1.84
Boiler plates	11	10	to	12	0	2.29	to	2.39
Tees	9	0	to	9	10	1.79	to	1.89
Channels	8	5	to	8	15	1.64	to	1.74
Beams	8	5	to	8	15	1.64	to	1.74
Round bars, ¾ to 3 in.	9	0	to	9	10	1.79	to	1.89
Galvanized sheets, 24 g.	16	5	to	16	10	3.23	to	3.28
Black sheets	12	0				2.39		
Steel hoops	11	0	&	11	10*	2.19	&	2.29*
Cold rolled steel strip, 20 g.	23	2½				4.60		
Cotton ties, Indian specifications	15	0				2.99		

*Export price.

Continental Prices, All F. O. B. Channel Ports, Delivery as Specified

No. 3 foundry pig iron:								
Belgium, October	£4	2½s.				$13.40		
Luxemburg, October	4	2½				13.40		
France, October	4	2½				13.40		
Billets:								
France, Oct., Nov.	5	10	to	£5	15s.	24.53	to	$27.65
Luxemb'g, Oct., Nov.	5	10	to	5	15	24.53	to	25.65
Lorraine, Oct., Nov.	5	10	to	5	15	24.53	to	25.65
Wire nails (keg basis):								
Germany	0	14½				3.23		
Belgium	0	20½				4.57		
Wire rods, 5 mm. (0.2 in.):								
Belgium	7	5	to	10	7½	32.34	to	46.27
Angles:						C. per Lb.		
Belgium, September	7	7½				1.47		
Tees:								
Belgium	8	5				1.64		
Merchant bars:								
Belgium, Nov., Dec.	7	10	to	7	12½	1.49	to	1.52
Luxemb'g, Nov., Dec.	7	10	to	7	15	1.49	to	1.54
France, Nov., Dec.	7	7½	to	7	12½	1.47	to	1.52
Germany, Dec.	7	12½	to	7	15	1.52	to	1.54
Joists (beams):								
France, Oct., Nov.	6	17½	to	7	2½	1.37	to	1.42
Belgium, Oct., Nov.	6	17½	to	7	2½	1.37	to	1.42
Luxemb'g, Oct., Nov.	7	0	to	7	2½	1.39	to	1.42
Channels								
Belgium	7	10	to	7	12½	1.50	to	1.52
⅜-in. plates:								
Germany, Nov., Dec.	8	0				1.59		
Belgium, Sept., Oct.	7	10	to	8	0	1.49	to	1.59
Luxemb'g, Oct., Nov.	7	17½						
France, not offered.								
¼-in. plates:								
Germany	9	0				1.79		
No. 8 gage wire:								
Belgium, August	14	10⅝				2.89		

BLAST FURNACES RESUME

Numerous Steel Works Stacks Added to Active List or Will Be Soon

PITTSBURGH, Sept. 12.—Resumption by blast furnaces in western Pennsylvania, Wheeling and Valley districts has gained momentum in the past week and to-day of a total of 139 furnaces in those districts 68 are active. That compares with a minimum of 50 in the closing week of August and 76 in blast in early July, before the railroad shopmen's strike made the coal strike effective. Since preparations are being made to start up several more furnaces in the near future, the prediction is safe that by Oct. 1 there will be as many, if not more, active stacks as there were in July.

All but one of the furnaces which have resumed are steel works as distinct from merchant stacks and the one merchant furnace which has resumed is making Bessemer iron for ingot molds and at the moment is not strictly in the merchant class. Most of the merchant furnaces in this and nearby districts depend upon the Connellsville district for coke supplies and right now it is almost impossible to line up tonnages in that district because the strike of the miners and oven operatives has not been settled and production still is very limited in relation to potential capacity. The wages now being paid in the Connellsville region are satisfactory, but a good many men now are members of the union and insist upon recognition of the union as a condition of their return to work. This the operators decline to do. The prices which prevail on the moderate offerings of bee hive oven furnace coke are too high to interest merchant iron producers at the present prices of iron. The steel companies do not have this obstacle to contend with since most of them have by-product plants and are able to get ample supplies of coking coal.

In the Pittsburgh district, seven furnaces have been added to the active list in the past two weeks. The Jones & Laughlin Steel Co., which during the pinch in the fuel supply had only two furnaces on, already has put on four furnaces and has ordered on two more, one of which is to make ferromanganese. The company plans to have 10 furnaces on by the end of the month. The Carnegie Steel Co. has one more furnace active in this district than it had during the last week of August, 25 of 34 stacks here now being active. It is reported that the Pittsburgh Steel Co. is getting ready to start up its second furnace and also that the Pittsburgh Crucible Steel Co. will turn on the blast in one of its furnaces soon.

In the Mahoning and Shenango Valley districts, 21 furnaces of a total of 48 now are making iron, a gain of nine in the past two weeks. Brier Hill Steel Co. has put on two stacks, Republic Iron & Steel Co. two, Sharon Steel Hoop Co. one, Shenango Furnace Co. one and Youngstown Sheet & Tube Co. three. The A. M. Byers Co. soon will light its Mattie furnace at Girard, Ohio, and blast will be turned on to-night at the Trumbull-Cliff furnace and a second Shenango furnace company stack will go on shortly. Starting up of one of the furnaces at the Farrell, Pa., works Carnegie Steel Co. is an early possibility.

In the western Pennsylvania district, including Johnstown, five of 17 furnaces are in blast, these all being Cambria Steel Co. furnaces. This is a gain of three furnaces by that company. In the Wheeling district, three out of 15 stacks are in blast, two at the Mingo, Ohio, works Carnegie Steel Co. and one at Labelle Iron Works, Steubenville, Ohio. The stack of the Weirton Steel Co., Weirton, W. Va., was banked last Thursday.

The Three-Shift Day at Steel Works

(*Continued from page* 658)

in consequence of better care, better attention, better morale, or increased alertness or expertness on the part of the men:

1. Increased efficiency, due in part to better physical and mental condition of the men, and in part (after the industry has been working the shorter hours for several months or years) to a better class of men attracted by better working conditions. This increased efficiency has manifested itself in increased production per man per hour and per machine per day, thus decreasing overhead expense. It has also appeared in better conduct of the operations, greater uniformity and regularity of operation and of quality of product, less fuel used, less waste, less repairs of equipment, better life of apparatus, etc.
2. Better morale, resulting in less absences, less tardiness, less shirking, and better discipline. The better discipline is due in part to the spirit of the men, and in part to the pressure which the foreman can, and will, exert, because he does not have to hold back out of sympathy for tired men.
3. Elimination of the "floating gang." This floating gang is an expedient, not a real remedy; it is an expense; it does not content the men, because it gives them their free day only occasionally on Sunday.
4. Finally an advantage which is not to be lightly considered in the event of labor disputes, the company which is working its men only 8 hours a day enjoys much greater prestige with the public, whose influence in a labor dispute is always important. This influence may, indeed, be the factor which decides whether a strike is long and costly, or short and comparatively inexpensive. The 12-hour shift, even with resting periods, leaves something to be explained to the public; necessitates a campaign of education at a time when the public is not always ready to be educated.

Comparative Labor Costs of 12-Hour and 8-Hour Shifts

It has often been pointed out that, in the ultimate analysis, the total cost of any manufactured product is composed chiefly of labor. To illustrate: Pig iron is made, by means of labor, out of ore, flux and fuel. The cost of the materials used is far greater than the cost of the labor, but labor produced the ore, the flux, and the fuel; and so it can be shown that labor is the basis of all cost, if one goes back far enough. However, the labor cost in the iron and steel industry, as affected by the 12-hour vs. the 8-hour shift is only a fraction of the total cost. To return to the illustration: The ore, the flux and the fuel do not represent any labor on the 12-hour shift basis, except a fraction of the cost of the fuel in some cases. And the operating labor in the manufacture of pig iron is only from 5.5 per cent to 8 per cent of the total manufacturing cost, while that much of it which still works on the 12-hour shift is a still lower percentage. So that those persons who argue, as some do, that the change from the 12-hour to the 8-hour shift would effect an increase of 90 per cent in the cost of the product are dealing in generalities which will not bear analysis.

Likewise, in the case of the open-hearth furnace: At least 50 per cent of the raw material used in the open-hearth is scrap, the price of which is determined by market conditions, and is not affected by any proposed change in the labor in the industry from 12-hour to 8-hour shifts.

Finally, only a part of the laborers in the industry are working the 12-hour shift. If that proportion of the men were changed to the 8-hour shift, and paid as much per day as they are now receiving for 12 hours' work, without, at the same time securing any compensating economic advantages through increased efficiency, increased morale, etc., the total manufacturing cost would be affected by only 3 per cent to 15 per cent. This is, in most cases, less than the variations in cost already experienced by plants competing with one another, due to efficiency of equipment, technical skill, wisdom in purchasing, location, capital resources, overhead expense, etc. If the increase in labor cost were compensated, at least in part, by resulting or accompanying economies in operation, the result would be correspondingly better.

As a matter of actual experience, it is known that some plants, or departments of plants, have changed from the 12-hour to the 8-hour shift and reduced their labor costs. Others are operating on the 8-hour shift with satisfaction to their management and stockholders. Others have changed and reduced their total manufacturing cost. Finally, there are other plants which have had experience with the 8-hour shift, the exact economic result of which is not known, but as to which there seems to be reason to believe that the total manufacturing cost is, at most, not much greater when working the 8-hour than the 12-hour shift.

Considerations That Have Held Back the Three-Shift Day

Mr. Drury's report consists of 125 typewritten pages and deals with the two-shift and three-shift day in the continuous industries. Such industries are considered under four group heads. The first group takes in iron and steel, non-ferrous metals, glass, Portland cement, lime, brick and pottery. In view of the prominence given to Mr. Drury's first report, comparing two-shift and three-shift operations in the iron and steel industry, we give below the portion of his Boston report dealing with iron and steel:

THE steel industry has received separate consideration in three special reports which may be considered as parts of this investigation.[1] In order, however, that the steel industry, which is by far the most important of the continuous industries, may not be omitted from the present general survey, there will be inserted a sketch of the general situation as respects hours.

For almost a generation, a few minor branches of iron and steel making have been carried on on three shifts, or an approximate equivalent. This has been true of the making of wrought iron and of what are known as "hot mills" in sheet mills. Here and there a few specially difficult jobs have been on eight hours; and once in a great while, an entire department. But these places where custom has long established an eight-hour shift occupy a small place in the steel industry as a whole. Prior to the war, the major branches of the steel industry were, practically without exception, operated on a two-shift basis. About one-half or a little less than one-half, of the employees in the continuous plants were on day work, which was usually ten hours. The other half (or more) of the employees worked twelve hours, or an alternation of eleven hours one week and thirteen the next (or ten hours one week and fourteen the next). In 1919, the United States Steel Corporation gave the number of its twelve-hour employees as between 69,000 and 70,000 and the number in the entire industry probably ran as high as 150,000.

Formerly steel plants were also on a seven-day week. But beginning about a dozen years ago, efforts

[1] See "The Three-Shift System in the Steel Industry," a paper read by the writer before a joint meeting of the Taylor Society, the Metropolitan and Management Sections of the American Society of Mechanical Engineers, and the New York Section of the American Institute of Electrical Engineers, in New York, Dec. 3, 1920, and published in the February, 1921, issue of the *Bulletin* of the Taylor Society. A more analytical study by the same writer, entitled "The Technique of Changing from the Two-Shift to the Three-Shift System in the Steel Industry," was prepared for the Cabot Fund, and a small edition privately distributed in May, 1922. This has not yet been released for general publication. See also Bradley Stoughton's report.

have been made to reduce the volume of seven-day work. Seven-day work is almost entirely extinct in rolling mills and to a large degree is absent in open-hearth and Bessemer work. Coke ovens and blast furnaces must, however, run seven days a week. In these branches of the industry the Steel Corporation and some of the "independents" have adopted arrangements by which the individual men are relieved one day in the week. Others among the "independents" still employ the men in these departments, a full seven days a week, as is true also of open-hearth work when business is normal.

Tendency to Shorter Hours

At one time it was thought that the steel industry could not be operated on any other basis than two shifts. Later, any tendency towards shortening hours was counteracted by the introduction of labor saving machinery; which has gone so far in the steel industry as practically to remove the strain from the majority of jobs. Furthermore, such work as is left is generally intermittent, so that, in most cases, the twelve-hour steel worker does not actually work more than 6 or 7 hours. Combined with these conditions, which seem to make a twelve-hour shift feasible from the physical standpoint, there were many, especially among the foreign born steel workers, who were willing and eager to work for as long as twelve hours, provided that by so doing they could earn slightly more money. Finally, the tendency towards ten or eleven hours for the day shift and thirteen or fourteen for the night shift, represented a crude approach to a ten-hour day, for on the long night shifts there was usually a certain amount of sleeping. All of these considerations together somewhat mitigate—but they do not remove—the fact that an average daily employment of twelve hours, added to the hour or so lost in coming and going, keeps a man away from his family or his other outside interests a large portion of his waking hours.

During the war, there was some tendency towards three shifts in the steel industry, in harmony with the larger movement in this direction which was taking place outside. But the movement did not reach very large proportions, partly because there was in the industry an acute shortage of labor, and in steel towns a shortage of houses, which made the large companies hesitate to attempt to put on an extra shift. By the end of 1920, about twenty of the "independent" steel plants—some large, but more of them small—had gone to three shifts—a number impressive enough to deserve some attention, but not large enough to affect very greatly the proportion of twelve-hour works in the industry. Thus as late as the beginning of the present period of depression, the steel industry was apparently almost as fully on a two-shift basis as it had ever been.

There is reason for believing that a changed attitude had been developing influenced by:

1. The general pressure throughout the country towards shorter hours;
2. The steel strike in 1919;
3. The attacks on the twelve-hour day in Congress;
4. The Inter-Church report on the steel industry; and
5. The conviction on the part of many steel men that the twelve-hour day was too long a period for men to work.

The Steel Corporation's Position

The Steel Corporation had appointed a committee empowered to consider and report on the practicability of abolishing the twelve-hour day. As the pressure for production and the shortage of labor in the steel industry subsided in the fall and winter of 1920-1921, the work of this committee became more active. A number of statements were issued regarding the progress of the committee's work; and finally, in the spring of 1921, Judge Gary issued for the corporation a statement to the effect that the corporation hoped to be able to eliminate the twelve-hour day, as the difficulties of doing so were overcome.

There is reason for believing that the officers of the Steel Corporation regarded the statement cited as a definite declaration of policy on the part of the corporation, that they intended to be understood as announcing a program of abolishing the twelve-hour day in corporation plants within the course of a year or so. But the statement was embodied in explanations as to the difficulties in the way of abandoning twelve hours. It came at a time when throughout the country there was a tendency towards lengthening rather than shortening hours. The Steel Corporation's proposed course met the moral opposition of some of the "independent" steel manufacturers. The investigator found during his studies in 1921 that there was a prevalent impression abroad both among the "independent" producers and the outside public, that the matter of abolishing the twelve-hour day had been allowed to drop.

Without calling into question the sincerity of the Steel Corporation's intention of eventually eliminating twelve-hour work, there can be no question that, by the time the Corporation had issued its statement, conditions were rapidly becoming more unfavorable for going to three shifts. A moderate slackening in business activity would have been favorable to introducing a third shift; but the depression which came on the steel industry was so severe that, while it interposed no mechanical obstacle to going to three shifts, it yet had the effect of turning people's thoughts in quite other directions. There were times in the summer of 1921 when steel production fell as low as thirty per cent of normal or lower. During this time overtime was abolished and wage rates on twelve-hour work were reduced almost one-half.

Business Conditions Made the Decision

Under these conditions the question of re-organizing the system of shifts in the steel industry was perhaps not unnaturally put in the background, while thought was turned on problems which were for the moment more grave. Moreover, men hesitated to put into effect a reduction of hours by one-third, when wages had just gone down by one-half; or to talk of making changes which might increase cost, when cost was already above selling price. What enthusiasm could be aroused for getting out more output, when, in some of the plants, at least, the greater the output the greater the losses? For reducing labor force when it meant discharging key men, whom it was desired to keep on the pay roll? Why shorten hours when men were fortunate if they had employment one week out of two? It is not surprising, considering the many harassing circumstances, that for some months practically no thought was given to making any far-reaching changes in the shift system.

It does appear that from the standpoint of external conditions and from the sentiment in the industry circumstances were favorable in 1920 and 1921 for the Steel Corporation to have changed from a two to a three-shift basis. Some "independents" believed that the corporation was going to make a change and they had their new manning schedules ready so that they too might promptly change.

There was no reason, however, why shifts could not in many cases be shortened during 1921, even if the development of a permanent three-shift system had to come later. In fact, the very depression and accompanying unemployment were the strongest of reasons why work should, wherever practicable be divided among as large a number of men as possible through shortening the hours worked by individual workers. And this course, was in fact, followed to a large extent. The movement, however, had its drawbacks and limitations. In some cases, the older and more valuable employees, whose incomes had already been radically affected by cuts in the hourly rates and perhaps by temporary transfer to positions below their regular grade, were unwilling to have hours reduced, in order to give work to men who belonged to the less stable element of workers. There is some risk in a company's going too far in giving all employees a small amount of work as competitors may coax away the pick of the employees by offering full-time employment. This general situation was the cause of some oscillation between twelve-hour and eight-hour shifts.

Notwithstanding the circumstances just discussed, the proportion of twelve-hour work in the steel industry was materially reduced during 1921 but all of this was not done as a matter of permanent policy. Most of the reduction in hours was by way of putting what had been on two twelve-hour shifts on two ten-hour shifts, or by having as much of the shift work as could be done by day workers. Thus the Steel Corporation ran rolling mills on ten-hour shifts. All sorts of arrangements as twelve, ten, nine, eight and even six-hour periods have been in use. Men were also worked a week and laid off a week. The net result was a substantial reduction in the amount of twelve-hour work. At times the proportion of twelve-hour workers in plants would be only ten or fifteen per cent, whereas formerly the common proportion was fifty or more per cent. The tendency was to retain on twelve-hour shifts only such work as absolutely had to be continuous through the twenty-four hours.

While some of these innovations of 1921 could be maintained as a part of permanent shift policy, yet it is evident that much of the development is essentially temporary. If and when the steel industry recovers, it is doubtful if large plants will want to run their rolling mills only twenty-hours out of the twenty-four. Nor did the steel mills in 1921 do much to lessen the proportion of twelve-hour work on blast furnaces, open-hearth furnaces, or other continuous-process work. In the absence of some firmer policy than was followed in 1921, there would likely be a drifting back towards the twelve-hour day in the steel industry as times improve.

We will omit for the steel industry the presentation of evidence regarding the results which have been met with in such plants as have gone to three shifts; because the facts have been published separately. It is opportune to say here that most of the plants reported upon in 1920 now state that they have lost some by operating upon the three shifts. However, in almost all cases, the managements state that, considering the intangible as well as the tangible factors, they were better satisfied with three-shift than with two-shift operation. One of the larger of the three-shift plants mentioned in the 1920 report went back to two shifts at the beginning of 1921 (as was noted in the paper as published) stating that the arrangements had not worked well. Such of the other three-shift plants as the writer has been in touch with have remained on three shifts.

Favorable Testimony

In fact, the evidence after a year of depression is now considerably more favorable to three-shift operation than it was in 1920. This would seem to be the case, partly because, down to the close of 1920, conditions were not favorable for getting the greater efficiency which might be expected on shorter hours, and because of more experience and hence the management would have more confidence in the change. Thus only a few miles from the company which in 1921 returned to two shifts, another plant, engaged in all the states of steel manufacturing from blast furnace to rolling mills, had reported in 1920 that its labor costs were almost, but not quite, as low on three-shift as on two-shift operation. A year later they were in the position of doing better on three shifts than on two. This company followed a policy of giving ten hours pay for eight hours work.

Another prominent steel company, which followed a policy of paying as much for eight as for twelve hours, was cited in the 1920 report as coming out almost even. But at that time the company was reluctant to pronounce its three-shift system a permanent success until it had withstood depression as well as prosperity. In the fall of 1921, this company reported that in its producing departments—open-hearth and rolling mills—it would not gain anything by going back to two shifts. In the service departments expenses would be cut to some extent if the company were willing to go back to two shifts; but as to the amount of the loss which three-shift operation meant in these departments, the company was not certain. It did not intend to go back to two shifts.

Another three-shift company, whose plant ranks among the largest in the steel industry, and whose employees originally petitioned for and accepted three shifts on a basis of no higher earnings per hour than were paid in two-shift plants, reported in 1920 that its manning had increased 50 per cent. In January, 1922, this company gave the increase as 35 to 50 per cent; and, after reiterating its feeling of satisfaction with the working of three shifts, added: "We are strongly opposed to twelve-hour working shifts, though not opposed to a ten-hour day where conditions seem to make that desirable. We believe that industry in this country can be so conducted as to permit of eight-hour shifts in continuous operations."

Eight Hours at Ten Hours' Pay

The evidence collected in 1920 and a weighing of the experience of 1921 and 1922 would indicate that it is doubtful whether all the departments of a steel plant can be operated as cheaply on three shifts as on two shifts, if the men receive as much pay for eight hours as for twelve. But there is tangible evidence strengthened by the developments of the last year, which indicates that under active and able management and with reasonable co-operation on the part of labor, costs on the three-shift system can be kept as low as on the two-shift system, provided wage rates are compromised so that eight-hour men receive pay equivalent to ten hours work instead of for twelve hours pay. Such a compromise, or even one less liberal, is ordinarily satisfactory to the men.

At the same time care should be taken not to be over confident. Most managements do not give the attention which they might give to the matter of securing the highest attainable degree of labor efficiency; so that it is probable that, in case of a general change from two to three shifts in the steel industry, assuming a fifty-fifty compromise on daily wages, the greater proportion of the plants, for the time being at least, would note some increase in labor cost. But, as has been shown in the two special reports on steel, this increase in cost could not be large; and there is no reason why it should not be practically offset by intangible improvements in relations and operations, due to the plant being on a more satisfying day.

It is very significant that, during the late period of very acute depression, exceedingly few companies, either in the steel industry or in other industries, have seen fit to go back from eight-hour to twelve-hour shifts.

Total Manufacturing Cost Would Be Increased by 3 to 15 Per Cent

The Federated American Engineering Societies' Committee on Work-Periods in Continuous Industry, in summarizing for last week's Boston meeting the reports of Messrs. Stoughton and Drury, devote a short chapter to the iron and steel industry. Some extracts are given below from what the committee says in commenting on the three-shift and two-shift systems:

IN 1919, the United States Steel Corporation employed approximately 70,000 12-hour employees. Altogether, there are perhaps 150,000 wage earners in the entire steel industry on 12-hour shifts.

A wise executive policy takes into full consideration the importance of the intellectual, the psychological and the physical well-being of labor, realizing that an immediate saving secured by over pressure inevitably becomes a loss in the long run. A refusal to co-operate on the part of the workers is an economic loss. Furthermore, it is obviously of no permanent benefit to the men if their hours are shortened beyond the point where

the industry can survive under competitive conditions.

The twelve-hour day is strongly established in the iron and steel industry by long custom and by its unusual adaptability to production requirements. Recent progress, however, has been in the direction of a shorter day as well as in the reduction of the proportion of men on duty seven days a week. This is shown by the following tabulation which gives the percentage of men so employed:

	7 Days per Week Per Cent		Working 12 Hr. Per Cent	
	1910	1920	1910	1920
Blast furnaces	75	29	69	63
Bessemer mills.....	18	12	65	75
Open-hearth	24	17	76	50

The above figures are from a Report of the U. S. Department of Labor, released for publication May 24, 1922, and on Documents Nos. 110 and 301 of the 62d Congress. From the same publication the following figures are also compiled showing the pencentage of laborers in the same three departments working the long shift and the short shift respectively in 1910 and 1920.

	Working 12 Hr. Per Cent		Working 8 Hr. Per Cent	
	1910	1920	1910	1920
Blast furnaces.....	69	63	1	18
Bessemer mills.....	65	75	16	22
Open-hearth	76	50	2	30

The proportion of men working 12 hours in the Bessemer mills is an exception to the general trend, but the Bessemer process has been on the wane for many years, and the number of men employed is probably very much reduced since 1910.

It is emphatically asserted by blast furnace managers working the eight hours that the higher grade of labor attracted by the shorter hours, the greater care and alertness, better work, and more skilful operation are all reflected in a saving in cost of production. Cost figures are confidential, but furnace operators working under the 8-hour day assured the investigator on more than one occasion that the cost of producing pig iron is less on the eight-hour than on the 12-hour day.

The operating labor in the case of pig iron is from 5.8 to 8 per cent of the total manufacturing cost. Only a part of the labor in the industry is working the 12-hour day. If that labor was changed to the eight-hour day and paid as much per day as it is now getting for 12-hour work even without securing any compensating advantages through increased efficiency, morale, etc., the total manufacturing cost of the product would be increased only from 3 to 15 per cent. This is in most cases less than the variations in cost already experienced by competing plants, due to difference in efficiency of equipment, technical skill, purchasing, location, capital resources, overhead expense and advantages due to good management.

The United States has the most profitable iron and steel industry in the world, making more money and more output than all the rest of the world put together and exporting its product in successful competition with foreign countries. The majority of managers and executives with whom the matter was discussed believe that the good of the industry can be better served by eliminating the 12-hour day than by increasing dividends provided by means of labor saving devices and in other ways this step can be taken without serious injury to the industry.

As a matter of actual experience it is known that some plants have changed from the 12-hour to the eight-hour day and reduced their labor costs. Others have reduced their total manufacturing cost. Others are operating on the eight-hour day with satisfaction to management and stockholders. Results in such plants may be summarized as follows:

a. The plants which have adopted the three-shift system, though paying wages a little less than is paid in corresponding plants working 12-hour shifts, have sufficient labor, both skilled and unskilled.

b. The management believes that the shorter hours attract a better class of labor.

c. Every executive interviewed stated that the labor turnover is less on the three-shift system than on the two-shift system.

d. Sufficient skilled labor can be trained in the plant if the change is made with the co-operation of the men, and if it is made gradually.

e. It is unnecessary to pay a full 12-hour wage to skilled labor to secure a sufficient number to work the 8-hour day.

Immigration Law Has Proved Unsatisfactory

Secretary Davis Says Temporary Measure Has Outlived Its Usefulness—Various Plans Proposed

WASHINGTON, Sept. 12.—While industrial interests of the country are complaining of threatened shortage of labor that promises to be serious, and are strongly of the opinion that the immigration laws should be liberalized, so as to admit more workers, it is a perplexing problem as to how this may be done satisfactorily. It is evident from correspondence coming to members of Congress and the Department of Labor that employers, in view of the many labor troubles that have developed since the signing of the armistice, are showing more interest in the quality of the immigration than heretofore. That the Administration is alive to the situation is evident by repeated statements coming from the Department of Labor and from members of Congress.

In a formal statement recently, Secretary of Labor Davis said that the 3 per cent immigration restrictive law, enacted one year ago to halt immigration, had outlived its usefulness, declaring that "a radically different program for dealing with the immigration problem" must be evolved. Mr. Davis maintained "that the 3 per cent law has served very well as a temporary measure under the conditions responsible for its enactment," but "a permanent policy should be upon an entirely different basis." Criticism was made by Mr. Davis and some industrial interests share the same view that immigration stock which has played so important a part in the upbuilding of America is not forthcoming under the present program. Figures show that the quota of immigrants allowed under the 3 per cent law has been either entirely filled or exceeded where it relates to the most undesirable types, but there is a deficiency of the more desirable class of immigrants. It is charged that this is one element that has played an important and serious part with regard to agitation and in connection with labor troubles. It is, of course, well known that organized labor has always advocated stringent and unduly restrictive immigration laws, including such absurd provisions as the literacy test and would welcome further obstacles to immigrants. The attitude of the Department of Labor often has been criticized for being entirely too sympathetic with the attitude of organized labor. Secretary Davis in the program he has outlined has taken into account the quality of immigration and based his reasoning on a theory that has been advocated by industrial economists. Mr. Davis makes the point that under the present passport systems in effect throughout the world power is lodged in the hands of foreign governments to say who shall and who shall not migrate to the United States. He said that the selection of America's future citizens "is therefore reposed in some other government which may refuse passports and keep at home those whom it wishes not to leave." The remedy he proposes would be to empower American officials at ports of emigra-

tion, in lieu of visé requirements, to subject aliens to examinations involving mental, physical and other characteristics so as to insure immigrants of a constructive type. Legislation of this character already is pending before the House Committee on Immigration and probably will be pressed for passage at the next regular session of Congress. It is quite conceivable that the program will carry provisions of such a restrictive character that they will be opposed by industrial interests, but at the same time it is known that many of them favor the basic principle of raising the quality of immigration, rather than of lowering the quantity and thereby to bar incoming aliens of radical tendencies. Many of them, it has been pointed out, do not constitute a laboring class, and consequently do not add to the labor supply, but do engage in industrial agitation.

Mr. Davis said that it is not the intention of the Department of Commerce to create an espionage system as a check upon alien residents of the United States, but said there should be an annual census of the foreign born who are not naturalized citizens. He also said that an annual fee should be demanded of each alien, the money to be used to educate the immigrants. Such a system, he believed, would permit the checking up of all of those who have violated the law in securing admission to the United States.

"If their regard for American law is such that they violate it in the first place by illegal entry," he added, "how can we expect that they will have any more regard for other laws? We will be able to trace surreptitious entries of Orientals, and we will be in a position to know our self-appointed enemies who are designing to rule America by revolution, as opposed to our settled principle of advanced government by evolution."

Sine Plate for Compound Angle Work

The numerous precision grinding operations encountered in modern tool-room problems frequently include operations of grinding compound angles. These generally have to be handled by some make-shift device or

Multi-Angle Sine Plate Designed to Set Work to a Compound Angle by Simple Angles Measured by Simple Sine Bar

by setting a simple sine bar to an angle determined from mathematical calculations that will produce the compound angle. To provide an easy and economical means of setting work to a compound angle the appliance illustrated has been developed and is being marketed by the Carling Tool & Machine Co., Hartford, Conn.

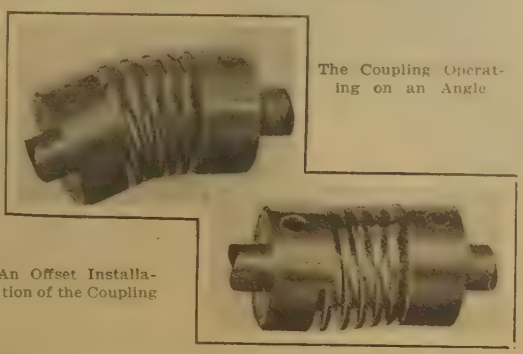
The device is designed to set work to a compound angle through the medium of simple angles determined and measured by the simple sine bar. Angles up to 46 deg. can be set precisely by the use of size blocks applied and computed in the same manner as a simple sine bar. Its pivot shafts are at exactly 90 deg. to each other and permit inclination of the table in a forward and sideways direction up to the maximum angle capacity. From this feature it might be called a two-way sine bar. The edges, table top and base seat are accurately aligned with the pivot shafts, permitting of quick, accurate set-ups on a grinder table.

In setting to an angle size blocks are selected, placed on the desired gage point and the pivot shaft bound. The binding action will be against the size blocks and supporting walls so that the setting will not be disturbed in clamping. The clearances cut in the base have kept the height in a level position to a minimum, well within the range of small surface grinders.

The size available at present has a 5 in. by 5 in. table 3½ in. high when level, 46 deg. capacity of inclination and 2 in. center distances of sine plugs. Special sizes can be developed if required. The square table is said to be the most efficient design, as it keeps the height to a minimum, reduces overhang of the table and presents the least interference when handling on a machine.

All-Steel Flexible Coupling for Light Duty

All-steel cut spring flexible couplings, as shown in the illustration, for shafts up to 1 in. in diameter have been placed on the market by the Steel-Flex Coupling Corporation, Detroit. They are intended for use in



The Coupling Operating on an Angle

An Offset Installation of the Coupling

connecting light-duty motors directly to small drill presses, blowers, fans and other machinery where shafts are slightly out of line, and where it is desired that the coupling act to reduce friction in shaft bearings and act to absorb shocks incident to sudden starts.

One of the illustrations shows the coupling operating at an angle, the other illustration being of an installation where there is considerable offset. It is always desirable, however, to have the shafts as nearly in line as possible. The couplings are formed from a cylindrical tube of steel said to be especially suitable for power transmission purposes. Safety set screws are used for securing the couplings to the shaft.

A standard line of coil spring flexible couplings for shafts 1 to 12 in. in diameter and having helical driving coils formed of rectangular chrome-vanadium steel bars, tempered to provide high elasticity, are also offered by the company. In the couplings the coils are mounted, one within the other, on machine steel plugs and on the end of the coils are shrunk steel headers intended to bind these parts into a continuous flexible unit. Flanges are attached by means of safety cap screws.

Gear Association Quartered at Cleveland with Permanent Secretary

The American Gear Manufacturers' Association moved its headquarters from Philadelphia to Cleveland last week and is now located at 2443 Prospect Ave., S. E., in that city. F. D. Hamlin, who has been secretary of the association since its organization, has resigned, and T. W. Owen, who has been associated with the Johns-Manville Co. in its Cleveland office for ten years, has been named acting secretary. With the growth of the organization, the secretarial work has increased to the extent that it requires all the time of the secretary, and Mr. Owen will devote his entire attention to the association activities.

F. W. Sinram, president, VanDorn & Dutton Co., Cleveland, has been president of the association since it was founded in 1917. The semi-annual meeting of the association will be held in Chicago, Oct. 9, 10 and 11.

CO-OPERATIVE DEALING

Plan of Youngstown Sheet & Tube Co. Proves Successful—Growing in Popularity

In line with the theory of President James A. Campbell of the Youngstown Sheet & Tube Co., Youngstown, Ohio, that to be successful a company must have contented employees, the company has established a co-operative system which is proving successful. It began three years ago in a small way and has now become an important part of the good work being accomplished under the plan of Employee Representation in effect at the company's plants. The amount of sales in June, 1922, was in excess of $33,000, and it is claimed that the prices charged were, on an average, twenty per cent under retail prices.

The system was established at the request of the committee on housing and domestic economics, and was in response to the urgent desire of the men in the mills, who complained that they were forced to pay excessive prices for the goods bought by them in local stores. They complained that every time wages advanced, and before the advance became effective, there was an increase in the cost of living, prices of meats, groceries and other supplies being raised.

"Knowing of the failure of many co-operative movements, the management hesitated to start a co-operative store," states W. C. Reilly, general superintendent. "It recognized, however, the justice of the request of the men and after a thorough investigation of co-operative stores in other localities, it was decided by the joint committee on housing and domestic economics to start simply a co-operative buying system, and gradually expand it as experience and patronage justified."

Business Expands

In the opinion of officials, the experiment has proved successful. The business has expanded and a greater variety of commodities is carried, embracing groceries, canned goods, shoes for men, clothing and other supplies required by men in the mills. Seasonable goods are also purchased when they can be distributed at a saving. It is pointed out that only first-class goods are accepted, and care is exercised in the quantities purchased so as not to secure an over-supply. The company furnished the capital for the enterprise and provided a place for the store, but caution is necessary in making purchases because the fluctuations of wholesale prices might at any time leave on hand a stock of goods that could not be disposed of without loss.

In May of this year the business had increased to such an extent that the company recommended abandonment of the stores within the plant and the establishment of a main distributing station, with several branches, for the convenience of the workmen. This was accordingly done and a central store was created at Struthers, near the main plant. All goods are received at the Struthers store and all orders to be delivered to customers are distributed from this store. A stock of goods is carried in both the East Youngstown and South Gate auxiliary stores, but no deliveries are made from these points. They are simply for the convenience of the men going and coming from the plant, or the families of workmen living in the vicinity.

Selling at Wholesale

"The purpose is to sell supplies of all kinds to workmen and their families at wholesale cost and the actual cost of handling," says Mr. Reilly. "The company does not realize any return on the capital invested and makes no charge for the space occupied by the stores. It will be well satisfied if the other necessary expenses are met. Up to this time it has been impossible to avoid some loss, owing to the expense of fitting up the stores, but it is believed that increased business will take care of the expenses from this time forward, without any increase in the small margin at which goods are sold.

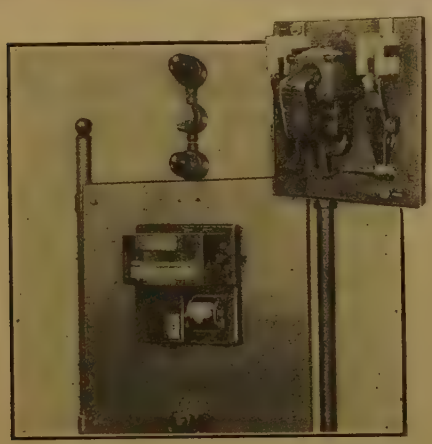
Keeps Down Prices

"The co-operative buying system has not only saved considerable money to patrons of the stores, but the principal benefit from it has been its tendency to keep local retail prices down to a reasonable level, a benefit shared by the entire community," Mr. Reilly points out. "The company is not particularly interested in the amount of business done in the stores, since it makes no profit from them; and it recognizes that the volume of business they do is not the full measure of their success, for the reason that while the patrons of the stores make a direct saving on all of their purchases there, they and other employees who do not patronize the stores are saved considerable money on account of the regulating influence the prices charged at these stores have on the prices charged by other dealers.

"In effecting the object for which it was established, distributing goods at cost to the patrons, and regulating the retail prices in this vicinity, we have not made the mistakes which have wrecked so many co-operative movements and believe the plan will continue to be a success."

Automatic Temperature Regulator

The Hoskins Mfg. Co., Detroit, has placed on the market the temperature regulating apparatus shown in the accompanying illustration. It is known as type R E and is designed to indicate and control the temperature of oil, gas, or electric furnaces of any type.



Temperature Regulating Equipment for Electric, Oil and Gas Furnaces

The control mechanism operates every 30 sec. and permits a temperature variation of the thermo-couple of plus or minus 10 deg. Fahr. When used on electric furnaces, the instrument operates a small relay, which in turn actuates the main power switch, which is of the magnetic type.

When the furnace is operating at the desired temperature, within 8 deg. Fahr., a white signal lamp is lighted. If the temperature goes above or below this limit the heat is shut off or put on, a red or green light appearing respectively. The control mechanism is operated by a small motor.

The illustration shows the complete equipment for electric furnace control, although the instrument can be furnished without the other apparatus if required.

Effective Sept 1, an increase of approximately 30 per cent in wages has been announced by the Harbison-Walker Refractories Co., the General Refractories Co. and the United States Refractories Co. Common labor now receives $3.50 per day as compared with the former rate of $2.70, and wages of skilled working men have been advanced in proportion.

COMBUSTIBILITY OF COKE*

A Laboratory Method for Its Determination -- Hardness Test

BY WILLIAM A. HAVEN

THE experiments herein described originated in an attempt to confirm by a laboratory test an apparently considerable difference in the combustibility of two kinds of by-product coke used at the Haselton furnaces, one from a coal mixture containing 85 per cent Klondike, the other from a mixture containing 85 per cent Upper Freeport coal.

The results obtained did not confirm our interpretation of the furnace practice in this particular case but in the course of the laboratory work we secured some satisfactory comparisons between the burning curves of charcoal, coke and the dense carbonaceous deposit found on the walls of by-product ovens. We were also able to verify the pronounced effect upon burning speed produced by variations in the size of coke. Our investigations were then extended to other grades of coke produced in the Mahoning Valley and to samples from by-product plants in Southern Ohio and the Chicago districts. We have now added the combustion test to the daily routine laboratory determinations for chemical analysis and hardness.

The Tumbling Drum Used for Hardness Testing of Coke

For the purpose of the test a large sample is secured from not less than five cars. From this a portion is taken, by quartering down, for chemical analysis and the remainder, after being dried for 24 hr., is crushed through a 3-in. screen onto a 1-in. screen. Ten kilograms of the portion which stays on the 1-in screen is placed in a steel drum for the Barrett tumbling test. The drum is rotated at a speed of 24 r.p.m. for a period of one hour. The sample is then taken out and passed through a ¼-in. screen. The weight of the coke remaining on the ¼-in. screen, expressed in percentage of the total sample put in the drum, is taken as the hardness factor.

Discarding the coke from the drum which passes through the ¼-in. screen, the remainder is quartered down to a ½-kg. sample, the entire amount of which is crushed to pass through a ¼-in. screen and that portion of it which remains on the ⅛-in. screen is used for the combustion test.

The furnace used in the test is made of ⅛-in. steel pipe, 12 in. long and 8 in. in diameter. In the center of the pipe is a hollow asbestos core around which is wrapped about 90 grams of from 19 to 22 gage wire. The core is packed in the pipe with asbestos and through it is inserted a silica tube, 1⅛ in. in diameter and 31 in. long. Oxygen is led into the furnace through a rubber stopper and the discharge end is packed with asbestos through which there is a small glass tube for the escaping gases.

A 1 gram sample of coke, sized as described above, is weighed in a platinum boat, ⅝-in. wide, ½-in. deep and 3⅛ in. long. The temperature of the furnace is brought to a constant at about 1800 deg. Fahr. The boat is placed in the furnace and the sample burned for one minute in an excess of oxygen which is assured by maintaining a pressure of 2 in. of mercury. It is then removed and weighed to determine the loss of carbon. In the same manner the loss in 2, 2½, and 3 min. is determined, or at ½ min. periods, until the combustible matter is nearly all consumed. The average of these results expressed in centigrams per minute is taken as the burning speed.

The determinations are run in duplicate or until a satisfactory check is secured for each period. In order that results may check closely it is essential to use platinum boats, identical as to size and shape, and to distribute the samples evenly within the boats so that the surface exposed to oxidation shall be as nearly constant as possible. About 45 min. work in the laboratory is required.

The Laboratory Apparatus Used in the Combustion Test of Coke

*From a paper before the Eastern States Blast Furnace & Coke Oven Association. The author is superintendent Northern Furnaces Republic Iron & Steel Co.

Nails Made by Minnesota Steel Co.

The first shipment of wire and nails made in the new plant of the Minnesota Steel Co., Duluth, Minn., was recently made. It consisted of 500 spools of wire and 1000 kegs of nails. For the time being the mill is reducing billets shipped to Duluth by the Illinois Steel Co., but later it will use its own steel. The output of the wire plant is marketed by the American Steel & Wire Co., just as the other products of the Minnesota Steel Co. are sold by the Illinois Steel Co.

Directors of the Crucible Steel Co. of America have offered to both common and preferred stockholders of record Sept. 11 an additional 50,000 shares of common stock at $100 per share on a pro-rata basis, according to a statement by H. S. Wilkinson, chairman. The object is to provide additional working capital.

REPLY TO PROTEST

Arrow Company Gives Reasons for Establishing Lower Pig Iron Rate

WASHINGTON, Sept. 12.—Replying to the protest of the Steel & Tube Co. of America, and other Chicago district producers, who have filed a protest with the Interstate Commerce Commission against the plan to establish a joint rail-and-water rate on pig iron from Florence and Sheffield, Ala., to the Ohio River and beyond, the Arrow Transportation Co. has asserted that irreparable damage would be done to it if the commission suspended the tariffs as suggested by the protestants. It is pointed out by the Arrow Transportation Co., which has proposed joint rates with the Chicago, Burlington and Quincy Railroad, that it has already invested $40,000 for the construction of barges to transport pig iron. The claim is further made that the company had contracted for delivery on Oct. 1 of a steel towboat at a cost of $120,000 when fully equipped. It is maintained by the company that even brief suspension of the tariffs would make entirely useless the equipment provided for to carry pig iron from Florence and Sheffield to Metropolis, Ill., for shipment beyond by the Burlington Railroad. The Arrow company makes an emphatic denial of the claim that its tariff is detrimental to the carriers' interest. It is contended that the commercial conditions involved simply are the desire of the Southern furnaces to take advantage of the rail and water transportation.

The through rate published in the Arrow tariff is made up of the $1.96 local rate of the boat line from Florence and Sheffield to Metropolis and the $2.22 division going to the Burlington Railroad on pig iron, brought to Metropolis by a railroad south of the Ohio River.

The Arrow company says that it serves only the furnaces at Florence and Sheffield, "the production of which is insignificant in amount, compared to the production at Birmingham. The figures are 2,500,000 tons per year at Birmingham as compared with 150,000 tons at Florence and Sheffield."

Fire Damages Inland Plant

CHICAGO, Sept. 11.—Fire of unknown origin broke out in the coal mixer serving the coke ovens of the Inland Steel Co. plant, Indiana Harbor, Ind., Sept. 7. Damage to machinery and equipment is estimated at $60,000. A most serious result of the conflagration is its interference with coking operations. Temporary arrangements are being made to take care of the mixing and conveying of coal for the ovens, but in the meantime operations have been interrupted in certain units of the plant dependent on coke oven gas, such as the annealing and galvanizing departments in the sheet mills.

Railroad Cars Ordered or Under Construction

WASHINGTON, Sept. 12.—For the seven months from Jan. 1 to Aug. 1 of this year, railroads of the United States had 25,763 more new cars, either ordered and under construction or installed in actual service than during the entire year of 1921, according to reports carriers have just made to the car service division of the American Railway Association. The railroads had installed or had on order 95,199 freight cars of various kinds during the seven months ending on Aug. 1, 1922, while for the year 1921 a total of 69,436 were ordered or installed in service. Of the total ordered or already installed, 41,405 were coal cars. Orders calling for the delivery of 29,175 coal cars were in the hands of car manufacturers on Aug. 1 last, and delivery of these cars is under way daily. Up to Aug. 1 of this year 12,230 new coal cars had actually been installed and during 1921, new coal cars either placed in service or ordered totaled 30,698.

There were also 39,612 box cars, either installed or on order during the first seven months of this year. The reports showed that orders for 31,610 cars existed on Aug. 1 last, while 8002 had actually been delivered and placed in service this year up to that time, while 21,543 new box cars were ordered and actually placed in service in 1921. The carriers also are augmenting their supply of refrigerator cars as is shown by the fact that on Aug. 1 orders had been placed for 6428. During the seven-month period, 3870 had actually been installed and placed in service, making a total of 10,318 installed or on order. During 1921 the number of refrigerator cars ordered or installed totaled 9355, exclusive of new refrigerator cars purchased by private companies.

Coal Companies Merged

PITTSBURGH, Sept. 11.—Details were made public last week by J. H. Sanford, vice-president Carnegie Coal Co., Pittsburgh, of a merger of several bituminous coal companies in the Pittsburgh and western Pennsylvania districts. The new company, now in process of formation, based on 1920 production figures, will have a normal annual output of 8,000,000 tons, and this may be increased by the inclusion of other producers to a total of 9,500,000.

The companies to enter the combination and the production of each for 1920 are: John A. Bell interests, 2,000,000 tons; Carnegie Coal Co., 1,350,000 tons; Verner Coal & Coke Co., 345,000 tons; Burgettstown Coal Co., 255,000 tons; Henderson Coal Co., 325,000 tons; Chartiers Creek Coal Co., 270,000 tons; McClane Mining Co., 475,000 tons; Meadowlands Coal Co., 500,000 tons; Pittsburgh & Eastern Coal Co., 240,000 tons; Pittsburgh & Erie Coal Co., 430,000 tons, and the western Pennsylvania mines Youghiogheny & Ohio Coal Co., 1,120,000 tons.

Pittsburgh Plus Case Hearing

WASHINGTON, Sept. 12.—Plans for resuming hearings in the Pittsburgh base case not having been completed, the date of Sept. 11, when representatives of the Federal Trade Commission had proposed to start taking additional testimony, has been abandoned. It is expected to set a definite date and place within a few days.

Interstate Commerce Decisions

WASHINGTON, Sept. 11.—The petition of the Northern Pacific Railway Co., on behalf of the Minnesota & International Railway Co., Big Fork & International Railway Co., and other carriers, for authority to continue the charge on structural steel and machinery from Duluth, St. Paul, Minneapolis and Minnesota transfer and Superior, Wis., to International Falls, Minn., without observing provisions of the fourth section of the interstate commerce act was denied to-day by the Interstate Commerce Commission.

The commission also issued an order to defer operation of schedules filed by F. W. Gomph relating to iron and steel articles from Utah common points to California points. The order defers the operation of schedules specified until Oct. 23.

Wages Advanced

The Walworth Mfg. Co., Kewanee, Ill., has advanced common labor from 30c. to 36c. an hour, following similar action by Chicago district subsidiaries of the United States Steel Corporation.

The Gifford-Wood Co., Hudson, N. Y., manufacturer of conveying, handling and elevating machinery, has purchased the property at Hulton, Pa., on the Allegheny River, formerly occupied by the Crescent Forging Co., and lately by the Mendel Box Co. Work of remodeling the buildings has been started. Officers of the company are William B. Wood, president; Benjamin Gifford, vice-president, and W. T. Wood, secretary-treasurer.

American Chemists Hold General Conference on Metric System

PITTSBURGH, Sept. 11.—The sixty-fourth meeting of the American Chemical Society, held here last week at Carnegie Music Hall and in several buildings of the Carnegie Institute of Technology, attracted one of the largest gatherings in the history of the society, registration reaching 1335. A meeting of the councilors was held on Sept. 4, and the business of the convention began with general meetings on Tuesday, Sept. 5. Wednesday and Thursday were given over to divisional meetings, while Friday and Saturday were devoted to excursions. That on Friday was a general one and took in a visit to the by-product plant and steel works, Carnegie Steel Co., Clairton, Pa., and to the Monongahela City, Pa., works, American Window Glass Co. Saturday the visitors were given a selection of places to go to and excursions were by groups.

A conference on world metric standardization held, Sept. 6, with Prof. Eugene C. Bingham, Lafayette College, Easton, Pa., chairman, brought together by invitation representatives of practically every scientific society in this country. The general topic was "Aid to World Metric Standardization," and a resolution was adopted favoring a gradual rather than a sudden adoption of the metric system. The United States Department of Education and other educational agencies will be asked to broaden the teaching of this system in the schools. Early discussion disclosed that several manufacturing companies were opposed to the adoption of the system owing to the expense involved by the change. Another resolution adopted by a narrow margin urged the adoption of the double marking system on merchandise, one marking to be under the metric system and the other under the present English system.

British Institute of Metals New Series of Lectures

A notable feature of the forthcoming Swansea meeting of the Institute of Metals will be the inauguration of a series of annual public lectures on "Subjects of Practical Interest to Those Engaged in the Non-Ferrous Metals Industry." The lectures are additional to the annual May lectures of the Institute of Metals, which have constituted a feature of the institute's work since 1910. Dr. R. S. Hutton, a member of council of the institute, and director of the British Non-Ferrous Metals Research Association, is to deliver the first of the new lectures, entitled "The Science of Human Effort (Motion Study and Vocational Training)". The lecture will be delivered at 8 p. m. on Tuesday, Sept. 19, at the Y. M. C. A., Swansea. The subsequent proceedings at Swansea include the discussion of 15 papers on various metallurgical subjects, civic and other receptions and entertainments, visits to works and a motor tour round the Gower Peninsula, the meeting lasting from Sept. 19 to Sept. 22.

Cost Accountants to Meet

Topics to be discussed by the National Association of Cost Accountants at their third international cost conference at Atlantic City, N. J., Sept. 23 to 28, include the following:

Actual costs as compared with Replacement Costs; Sales and Administrative Costs; Standards as a Means of Reducing Costs; Budgets—Their Construction and Use; the Place of Costs in Business Management; Cost Problems of the Textile Industry.

Among those who will participate are Ambrose Downs and N. D. Farmer, Carborundum Co., Niagara Falls, N. Y.: R. H. Gregory, Western Electric Co., New York; S. C. Allyn, National Cash Register Co., Dayton, Ohio; Irving Berndt, consulting industrial engineer, New York; R. W. Darnell, Ritter Dental Mfg. Co., Rochester, N. Y.; John M. Scanlon, Hess-Bright Mfg. Co., Philadelphia; S. L. Whitestone, General Electric Co., Schenectady, N. Y.; C. M. Finney, Worthington Pump & Machinery Corporation, New York; C. E. Patterson, vice-president, General Electric Co., New York.

Under the topic "The Place of Costs in Business Management" will be covered in a practical way, the broad question of the relationship which ought to exist between the cost department and the other departments and the general management. This should be of particular interest not only to cost men, but, also, to managing executives who are interested in getting full value out of their cost departments.

Motion Pictures in Industry

On Thursday afternoon, Sept. 14, at 2 o'clock during the week of the National Exposition of Chemical Industries at the Grand Central Palace, New York, several papers are to be presented before members of the Technical Photographic and Microscopical Society, which is to hold a general meeting in the lecture hall at that time.

Among the papers to be presented is one entitled "The Motion Picture as an Aid to Industry" by Dr. Alfred B. Hitchins, director of the Ansco Research Laboratory, Ansco Co., Binghamton, N. Y.

High Grade Steels Neglected

Any improvement there may be in the steel trade of Great Britain, according to the *Engineer*, London, is practically restricted to the basic and cheaper grades. Acid steel is meeting with very little demand and the high-speed and other special steels for engineers' tools will not, of course, be wanted until there is a revival in the engineering industry. The serious competition Sheffield steel makers have of late been experiencing from the Lincolnshire furnaces has, if anything, been intensified, with the result that Sheffield soft billets have been reduced by 5s. to £7 5s., but this is still dearer than similar steel delivered by Lincolnshire makers in Sheffield.

Chileans Want Machinery Catalogs

The American Commercial Attaché at Santiago, Chile, advises the Department of Commerce that although that office receives catalogs from American manufacturers in each mail, it is not collecting them with sufficient rapidity to meet the requests for information which are steadily being received. There is an especially active demand for catalogs of machinery of all kinds, not because of any particular prosperity among Chilean manufacturers, but for the reason that the representation for specialized American machinery is rather lacking in Chile except in certain lines where the makers are represented by their own salesmen or by an unusually alert agency. Many orders for machinery have been placed in Europe simply because of a lack of knowledge of the American product or in default of accessible American catalogs and price lists. It is suggested that catalogs be sent to the American Commercial Attache at Santiago, Chile, (Casila 27-D, Santiago, Chile), by such American machinery builders as are interested in export trade. At present there is particular interest in wood-working machinery, especially that equipped with electric motor drive.

Equipment for Air Service

SPRINGFIELD, OHIO, Sept. 11. — A conference of McCook field men was held Friday afternoon with General Manager George E. Ireland and experts of the Steel Products Engineering Co. regarding the manufacture of special equipment for the balloon section of the United States Air Service. The company is making a balloon tender, which is to be used in pulling down a captive balloon. It is also turning out a compressor which will be used in refilling balloons in the field. Each will be placed on a four-wheel drive truck chassis. The company is not only making the balloon equipment but it is building special truck axle drive, axles and other parts of the machines. The company has received an order from the Government for 14 crankcases for 18 cylinder engines for the Air Service.

Three New Books on Labor Problems

Immigration, Radicalism and Other Problems Discussed from Varied Viewpoints

REVIEWED BY CHARLES MORRIS MILLS

The Federal Administration and the Alien. By Frances Kellor. Pages xvi + 64. Published by George H. Doran Co., New York. Price, 50 cents.

The Peril of the Republic. By David Chauncey Brewer. Pages vi + 354. Published by G. P. Putnam's Sons, New York. Price, $1.75.

Industrial Unionism in America. By Marion Dutton Savage, Ph.D. Pages v + 344. Published by the Ronald Press, New York. Price, $2.25.

FRANCES KELLOR is pre-eminently fitted through training, experience and position to deal constructively with the immigration problem. Her little book, "The Federal Administration and the Alien," is a supplement to her larger work, "Immigration and the Future," published in January, 1921. Up to the present time our governmental policy toward the alien has been to guide him toward the point of entry or rejection. The three per cent restriction law has sought a numerical solution. Miss Kellor, writing just previous to the final passage of the three per cent law, does not touch on the regulation of the amount of immigration, but with the even larger question of the policy of the present Federal Administration, particularly from an international point of view.

Restrictive immigration measures, passed in a time of supposed emergency, do not reach many fundamental problems. The reorganization of our Federal immigration service; the development of domestic markets by using aliens as salesmen for foreign goods and of foreign markets by returning aliens; the safeguarding of immigrant savings; the stimulation of the investment of such savings in this country; the protection of the alien temporarily residing in this country; the training toward citizenship of the alien permanently remaining; and the promotion of international good-will through the immigrant are among some of the more pressing questions not included in regulatory methods.

As Miss Kellor lucidly points out, "the Government should not lose sight of the immediate program, which is to restore Ellis Island to a basis of pre-war efficiency; to enforce and recodify the existing immigration law; to rearrange Federal immigration duties so as to avoid overlapping; to stabilize immigration through the Department of Commerce to capitalize the immigrant's resources through the Treasury Department; to protect aliens; to overhaul the antiquated naturalization service, and to institute an inquiry which will provide a permanent substitute for emergency measures." In many States unjust discriminatory laws break down the alien's respect for law, and he retires to the racial colony for protection—to become an unassimilated element in our population. The relationship of Federal officials and racial leaders built up during the war should be continued, for "if there is any one subject upon which the foreign born voter can help the country it is immigration," and "it is his point of view and personal interest that needs to be joined to those of the native born to secure an all-around policy which will fully represent American interests."

In international relationships the immigration problem has reached an added importance through the creation of the Emigration Commission of the International Labor Office of the League of Nations; in the development of the control of emigration from certain countries; and in the competition of more sparsely settled countries for immigration. If we are to deal intelligently with the alien as an international human being, we should construct as sound a policy as on international finance or commerce.

Many industrial leaders are realizing to-day that the present three per cent law, effective in holding back huge tides of immigrants, is not furnishing us with the type of immigrant necessary to upbuild the nation's resources. The present statute will be revised sooner or later. Miss Kellor's book is of timely importance to those interested in a practical solution of this great problem.

Pessimistic Views as to Aliens

A FRANKLY pessimistic view of the alien situation is pictured by Mr. Brewer in "The Peril of the Republic." The sub-title, "Are We Facing Revolution in the United States?" is sufficiently indicative of the general outline of the book, which "is written with the sole purpose of pointing out that the alien invasion has quickened the drift to political revolution." Unquestionably the vast changes in our nation during the last 100 years in homogeneity, environment, and general personnel have transformed our democracy far from its original basis, but surely the individualistic conceptions of the founders of the Republic cannot be applied in entirety to the problems of the heterogeneous nation of 110,000,000 people to-day. Nor has the change in the form of government been confined to America—the foremost nations during the same period have moved from individualistic laissez-faire monarchies to social democracies. The great task and contribution which American democracy can make lies in applying the pith and substance of our Constitution to our great social and industrial problems. Our profound confidence in the Republic is justified in the very sureness of the triumph of American democracy in adjustment and solution during the course of the twentieth century.

Therefore, most of us will find it difficult to agree with the alarmist point of view of Mr. Brewer in feeling that we are on the brink of a social and industrial revolution which may be directly traced to the alien invasion of the last 30 years. All of us recognize the vast difference in political antecedents, language, and racial characteristics of the more recent type of immigrant with those of America. Undoubtedly a small minority of these newcomers are professedly dangerous radicals with extreme views, but the great, vast majority of these people are industrious, sober workers. It is difficult to believe that "the Government of the United States as at present administered cannot live"—principally (as the author says) because it does not adequately protect itself against the machinations of communistic groups and extremely socialistic propagandists sufficiently large and powerful enough to threaten the life of the Republic. The thorough patriotism of the thousands of foreign born and first generation Americans who served faithfully through the Great War is sufficient refutation for such extreme views.

Certain portions of the book dealing with the exploitation of the immigrant, naturalization and Americanization are more mild and somewhat constructive, but in naming perverse education as one of the causes of the downfall of democracy, the author actually questions the worth of our educational system. At least,

"the founders of the Republic recognized the value of education for those who could use it advantageously, but they did not attempt to provide more of this education, even for those whose faculties fitted them to absorb it, than was commensurate with the safety of the Republic. Mr. Brewer then suggests that moral training and suitable environment be substituted for years misspent in the classroom under socialistically inclined teachers supported by huge taxes. Just how our "extravagant and artificial school system" is to be reconstructed is not explained!

Summing up, we must "hold fast to whatever rights and privileges we still retain—by calling back to private life the army of office holders who form a large percentage of the population, using the schools to teach democracy instead of sociology, regulating the alien population, and providing a censorship for the non-English press—in short, by doing the obvious things to block revolution, whether it comes by fire or sword, or possibly by the art of the adroit autocrat." Surely such words may bring great comfort to the heart of the reactionary who thinks the country is on the verge of the bow-wows, but for the middle-of-the-way citizen, interested in an open-minded discussion of the alien problem, there is little of fact or fancy in "The Peril of the Republic."

Different Kinds of Labor Unions

FOR some time there has been a widespread demand for reliable and impartial information regarding the development of the newer type of American labor union organized around a complete industry, in contrast with the "old-line" unions organized by crafts or trades. Dr. Savage's "Industrial Unionism in America" is an able presentation of the facts and factors in the growth of industrial unionism. It makes no attempt to discuss the right of labor organization, but deals with an analysis of the various types of industrial unions. The chief difference between the old and new unionism lies, not in the structure, but in the spirit and philosophy of industrial unionism. In the main, the industrial union is based on the idea of the solidarity of labor, laying stress on the mutual dependence of both skilled and unskilled workers in their struggle against the capitalist system, and the majority of industrial unions "are distinctly hoping for the abolition of the capitalist system and the ultimate control of industry by the workers themselves."

The book is divided into three sections: the first deals with industrial unions within the ranks of the American Federation of Labor, such as the United Brewery Workers, United Mine Workers and Mine, Mill and Smelter Workers; the second discusses radical industrial unions, including the workers of all industries, such as the I. W. W. and the One Big Union; and the third with independent industrial unions, such as the Amalgamated Clothing Workers, Needle Trade Workers' Alliance, United Textile Workers, Amalgamated Textile Workers and numerous small unions.

Many matters of considerable momentary importance are ably discussed. The struggle between the conservative and the radical elements for the control of the policy of the United Mine Workers; the effect of prohibition upon the United Brewery Workers; the historical development of the Western Federation of Miners; the unrelenting non-co-operative policy of the I. W. W., and the educational and co-operative program of the Amalgamated Clothing Workers are interesting sidelights on the present industrial crisis.

In the conclusion, the author touches upon the psychological and social influence of industrial unionism, particularly the effect of their radical philosophy on the expansion of craft unionism. The main tenet of industrial unionism is class consciousness. Is the latter an unmitigated evil? Would the control of industry by workers be more efficient? Why is the general attitude of industrial unions toward present collective agreements restrictive? Are industrial unions more democratic than craft unions? Is there any social idealism connected with radical industrial unionism? These are some of the questions which the author discusses at the end of his analysis, leaving final judgment with the reader.

For the industrial executive and the student of our industrial relations problems, this analysis of some of the most important elements in the labor movement to-day should be of considerable value, although the antipathy of more conservative readers may be aroused by the discussion of the various doctrines of radical unionism.

Causes and Prevention of Accidents in the Iron and Steel Industry

In a 400-page volume, the United States Bureau of Labor Statistics has gathered data and made a comprehensive analysis of the accidents during the 10 years, 1910 to 1919, in the iron and steel plants of the United States. This has been published as bulletin No. 298. It consists very largely of tabular matter grouped according to the kind of plant and further grouped under several combinations according to the character of the accident cause, the character of the damage inflicted, and further with regard to the severity of the accident—whether fatal or causing permanent or temporary disability. In the latter case, the average duration of the disability forms another classification.

Blast furnaces, Bessemer and open-hearth plants, foundries, heavy rolling mills, plate mills, tube mills, sheet mills, fabricating, electrical and mechanical departments and yards form the different classifications according to the kind of plant, to which should be added one unclassified heading. The accident cause is grouped under the several headings of machinery, steam apparatus and power vehicles, hot substances (including both molten metals and other materials) fall of the worker, falling objects, handling tools and other objects and unclassified.

Numerous diagrams illustrate the text and bring out more clearly than figures the subjects of accident frequency, severity, etc. A number of half-tone illustrations, showing situations under which accidents occur and safeguards against their occurrence, illustrate the text.

In a 32-page pamphlet, "The Finances of Disarmament," the Mechanics & Metals National Bank, New York, traces the work of the late Washington conference on the limitation of armament and presents figures to show the ultimate financial saving to the principal nations involved. For the United States, Great Britain and Japan these savings, based on probable naval costs in 1928, are placed at $270,000,000, $260,000,000 and $250,000,000, respectively, per year. Based on completion in 1924 of known naval programs, these annual savings are placed at $90,000,000 less, for each country, than for 1928. Even this, however, results in an aggregate saving, for the three powers, of $510,000,000 annually.

The Arcade Malleable Iron Co., Worcester, Mass., is operating its third 20-ton reverberatory furnace in a newly constructed plant unit, which gives employment to 30 additional molders. The company's present 60-ton furnace capacity compares with 38 tons a year ago. The plant is operating five days a week and has sufficient business on its books to continue on that basis the balance of 1922 at least.

FOREIGN CONDITIONS

Observations of W. P. Snyder, Jr., During Two Months in Europe

Impressed greatly by the energy and application of foreign workmen, W. P. Snyder, Jr., president Shenango Furnace Co., Pittsburgh, who has just returned from a two months' trip to Europe, fears that the foreign trade of the United States will suffer, unless American workmen develop some of that spirit of willingness to work, which is the prevailing characteristic of workmen abroad. This becomes essential in view of the recent wage increase in the iron and steel industry, Mr. Snyder says, for not only did he find foreign workmen laboring faithfully, but putting in long hours and in most countries at very low wages.

In France, common labor was being paid 15 to 20 francs per day, equal, at the rate of exchange when Mr. Snyder was in that country, to only about $1.50 in American money and for that rate the men were working 12 to 14 hours daily. In the war ravished areas in that country, remarkable industry was being shown in reconstructing homes and an interesting feature of this work to Mr. Snyder was the use of steel to support the exteriors of stone. In England, wage scales are more comparable to those in this country, but employers had the situation well in hand and there were no signs of trouble.

In Germany, however, working conditions were almost chaotic, due chiefly to the frequent fluctuations in the value of the mark. The 8-hour day is generally established, and not only does production suffer from that fact, but also because of the frequent interruptions occasioned by the changing value of the money unit of the country. The men apparently keep well informed on the mark value and when it declines, they make instant demands for increases. One day the rate of pay for common labor in such establishments as Krupps was 35 marks per hour, but the next day it was 50 marks because of a drop in the exchange value. Marks sold as low as 1400 for $1 during Mr. Snyder's visit, but generally are rated at 1000 to the $1. At the latter rate, German laborers are receiving the equivalent of 5c. per hour in American money, or 40c. per day of eight hours.

Mr. Snyder commented upon the absence of new automobiles in either England or on the continent, saying that most of the cars he saw were models of five to seven years ago. So many American-made trucks remained overseas at the conclusion of the war that everywhere, especially in France, practically no other makes are seen. These trucks were disposed of at very low prices and much below what foreign trucks could be produced for, even to-day.

GERMAN STEEL INDUSTRY

Production Data for 1920 and 1921—Exports and Imports for June, This Year

Based on data published in two German journals, the National Federation of (British) Iron and Steel Manufacturers makes public the German pig iron and steel production for 1919 and 1920. So far as known this is the first information regarding the activity within German industry in those two years. Compared with pre-war years the data are as follows in gross tons per month:

	Pig Iron	Steel
1912	1,279,200	1,339,600
1913	1,373,000	1,445,000
1920	464,000	552,000
1921	508,000	725,000

These figures do not include Luxemburg.

Data have also recently appeared in *Stahl und Eisen* covering the exports and imports for June, which were 213,220 tons and 215,022 tons respectively. Compared with pre-war data, the movement this year and in 1920 and 1921 is as follows in tons per month:

	Exports	Imports
1912	482,400	27,300
1913	516,900	25,000
1920	143,600	26,200
1921 (8 months)	203,600	.....
1922 (6 months)	205,700	151,800

The chief items in German exports in the last two months of this year (May and June), have been rails, shapes and plates. The chief countries of destination have been, besides Holland, the Argentine, Sweden, Japan, United Kingdom, British India. The large imports are made up of a considerable influx of scrap iron and steel.

National Steel Lumber Sections

In a little cloth bound volume measuring 4 x 6½ in. and carrying more than 180 pages, the National Pressed Steel Co., Massillon, Ohio, has put out a handbook of steel lumber of the same general scope as the familiar handbooks of structural steel sections issued by the various manufacturers of those sections. The book is full of information regarding the use of the light sections covered under the general heading of steel lumber, as used both separately and in conjunction with the heavier rolled steel shapes long familiar in building construction. Numerous diagrams show the method of handling the steel lumber, while tables of strength, safe loads, deflection, etc., give the same sort of information as obtains elsewhere with regard to the heavier sections.

This subject has become one of increasing importance in the past few years, owing to a deepening realization on the part of forward looking observers of the ultimate and rapid exhaustion of our most available timber supplies, together with the desirability of having a building material of greater permanence than wood. A paper before the American Iron and Steel Institute last year dealt with this subject in some detail. Another paper heading this issue of THE IRON AGE covers the same subject from a somewhat different angle. Still a third contribution to this subject appeared on page 469 of THE IRON AGE for Aug. 24.

It is evident, therefore, that a handbook permitting the architect and engineer to specify intelligently the light sections required for buildings of different character and with differing floor loads should be of great interest to the building profession.

Formal Report to Senate on Proposed Steel Merger

WASHINGTON, Sept. 12.—Acting Chairman Victor Murdock of the Federal Trade Commission last Thursday made a formal report to the Senate, in response to a resolution of Senator LaFollette of Wisconsin, advising that the commission had issued a complaint against the Midvale Steel & Ordnance Co., the Republic Iron & Steel Co., and the Inland Steel Co., in connection with their proposed merger. The report carries the usual statement that the complaint is merely the institution of formal proceedings to test the legality of the merger. It is stated that at the conclusion of testimony and after argument, the commission will determine the facts and apply the law thereto.

"And only if such a conclusion is justified by the facts will an order to cease and desist from the proposed merger be issued," says the report. "Otherwise the complaint will be dismissed. In other words, in the issue of the complaint the Federal Trade Commission expresses no final judgment as to the legality of the proposed merger. If an order to cease and desist from the proposed merger is issued, it is, of course, subject to review by the United States Circuit Court of Appeals."

The Cleveland-Cliffs Co. has announced that it will resume operations at its iron and chemical plant at Gladstone, Mich., on full production by Oct. 15. With this stack in blast all charcoal furnaces in Michigan are again in production, a condition that has not obtained since 1920.

Machinery Markets and News of the Works

FURTHER PRICE ADVANCES

Some Milling Machine Manufacturers Raise Quotations 10 to 12½ Per Cent

Not a Large Volume of Business Is Being Done, But Considerable Is on the Point of Closing

The practical certainty that machine-tool prices will be generally advanced, coupled with announcements of price advances already made, is responsible largely for the volume of tool business now being placed, which, though not large, continues to show an improvement over the first half of the year.

At least two or three of the principal manufacturers of milling machines have sent out notices of price advances averaging 10 to 12½ per cent. A manufacturer of screw machines has adjusted prices slightly upward. One line of shapers has been advanced 20 per cent and a line of boring machines 10 per cent.

Considerable business is at the point of closing, but it cannot be said that a marked turn for the better has come yet. Much is expected from the railroads, but such business is materializing very slowly. The Chicago, Burlington & Quincy will buy against its recent lists soon and the Chicago, Rock Island & Pacific has shown renewed interest in some items on a list it put out months ago. The Atchison, Topeka & Santa Fe has purchased two milling machines and still has one or two machines to buy. There have been other purchases of individual machines by other roads, including a 90-in. driving wheel lathe by the Boston & Albany.

The Studebaker Corporation, South Bend, Ind., has practically completed buying for its No. 2 plant, but has begun construction of an addition to its No. 1 plant. The International Harvester Co. continues to place orders for its tractor plant in Chicago. The Universal Portland Cement Co. has bought about $7,000 worth of tools for its plant at Buffington, Ind. A new Cleveland plant has acquired 11 manufacturing lathes.

Steel mill equipment is being purchased by the Otis Steel Co. for additions to its works at Cleveland and the National Enameling & Stamping Co. is about to buy for sheet mills at Granite City, Ill. The Weirton Steel Co., Weirton, W. Va., has bought rolling mill equipment.

New York

NEW YORK, Sept. 11.

BUYING in this district is almost entirely confined to single tool purchases. Some lists from railroads, which buy here, are anticipated, in view of the activity in railroad buying in other parts of the country. Used tool dealers continue to report business good, but many of the sales are not in this territory. One used tool dealer in New York reports sold the past week a 48-in. and a 60-in. lathe and two grinders. The two grinders were the only part of these sales purchased here, the two lathes being for shipment to the Middle West. Within the next 10 days or two weeks an advance in price is expected on milling machines. Railroads which have recently purchased tools outside of New York include the Union Pacific, one radial drill, two wheel presses, one 42-in. lathe and one boring mill; Boston & Albany Railroad, one driving wheel lathe; Oregon & Washington Railroad & Navigation Co., one side head milling machine and one 30-in. planer; Los Angeles & Salt Lake City Railroad, two wheel presses, one radial drill and one car wheel drill. The Illinois Central Railroad will close on a list of between 10 and 12 tools. The General Electric Co. still has some tools pending.

Extreme dullness has characterized the crane market here in the past week. The only new inquiry of size that has appeared is a preliminary request for prices on furnishing two 150-ton overhead traveling cranes, issued by Thomas E. Murray, 55 Duane Street, New York, for the Brooklyn Edison Co., Brooklyn, N. Y. Specifications on the 60-ton, 71-ft. span, 4-motor electric traveling crane for the Phoenix Utility Co., 71 Broadway, New York, have been devised. The tender of the Board of Harbor Commissioners, Wilmington, Del., bids on which were opened Sept. 8, resulted in a low bid of $61,000 submitted by the Brown Hoisting Machinery Co., for furnishing the three 20-ton locomotive cranes and two 2½-ton portal cranes. The Orten & Steinbrenner Co. was the low bidder on the three locomotive cranes, but did not quote on furnishing the two portal cranes. Other bidders were the Browning Co., Heyl & Patterson, Dravo Contracting Co., Wellman-Seaver-Morgan Co. and the Lakeside Bridge & Steel Co. Bids are being received by the Board of Harbor Commissioners until Sept. 16 from dealers in used equipment.

Among recent sales are:

Hood Rubber Co., Watertown, Mass., a 7½-ton, 22-ft. 6-in span electric traveling crane from the Milwaukee Electric Crane & Mfg. Co.

Superior-Portland Cement Co., Concrete, Wash., a 3-cu. yd., 62-ft. 10-in. span grab bucket crane from the Shepard Electric Crane & Hoist Co.

American Car & Foundry Co., New York, eight 2-ton and 3-ton electric hoists from the Shepard Electric Crane & Hoist Co.

Navy Department, Hawaii, three 1-ton and 2-ton capacity cranes, one electric, one motor-driven and one hand power, from the New Jersey Foundry & Machine Co.

New Britain Waterworks, New Britain, Conn., a 5-ton, 33-ft. span hand power crane from the New Jersey Foundry & Machine Co.

Standard Oil Co., 26 Broadway, New York, a 20-ton, hand power crane from an unnamed builder.

P. C. Weil & Son, Bethlehem, Pa., a 10-ton, 40-ft. span, double I beam hand power crane from the Roeper Crane & Hoist Works.

Chester Paper Co., Chester, Pa., a 2-ton, 45-ft. 10-in. electric traveling crane from the Roeper Crane & Hoist Works.

The U. S. Sales Co., manufacturers' representative, 120 Liberty Street, New York, desires to get in touch with manufacturers of rolling machinery, oil burning furnaces and other equipment necessary for rolling angles, flats and other bars from old rails.

The American Brake Shoe & Foundry Co., 30 Church Street, New York, has purchased 17 acres at Portsmouth, Va., as a site for new works. Officials of the company have organized the Ramapo-Ajax Corporation to acquire the plants of the Ramapo Iron Works, Hillburn and Niagara Falls, N. Y., and Niagara Falls, Ont., and the Ajax Forge Co., with plants at Chicago and Superior, Wis. The works will be continued in operation for the manufacture of railroad track material, and improvements will be made. To carry

out the acquisition a bond issue of $2,250,000 of the subsidiry organization is being sold.

The Staten Island Marble & Tile Works, West New Brighton, S. I., has acquired property, 100 x 140 ft., on Richmond Terrace, as a site for a new plant.

The Baltic Ice Mfg. Co., Inc., 91 Columbia Street, Brooklyn, has plans nearing completion for remodeling the one-story building, 100 x 200 ft., recently acquired, for a new ice-manufacturing plant, estimated to cost about $50,000. A list of equipment will be arranged at an early date. Max Hirsch, 26 Court Street, is architect. Jacob Swartz is president.

The American Can Co., 120 Broadway, New York, has acquired a six-story factory at 118-24 Pearl Street, Brooklyn, on site 100 x 125 ft., adjoining its present plant, and will equip the building for extensions.

The Imperial Hardware Mfg. Co., 511 Flushing Avenue, Brooklyn, plans the installation of equipment for the production of small U-shaped channels and affiliated specialties.

In connection with the acquisition of the Manufacturers' Tool & Die Forks, 185 Twenty-second Street, Brooklyn, by the Prima Radio Corporation, the merged organization will manufacture a line of animated toys at the Brooklyn works. The wireless equipment branch will provide an average production of 2000 radio tube sets and 3000 crystal sets, monthly. William Schilling is president.

Simon Bruner, 64 Fulton Street, New York, manufacturing jeweler, has leased a floor in the building on the southeast corner of Seventh Avenue and Furteenth Street, totaling about 10,000 sq. ft., for the establishment of new works.

John Stahl & Son, 4761 White Plains Avenue, New York, will soon take bids for a four-story addition to their automobile service and repair plant, estimated to cost about $60,000.

The Superintendent of Light Houses, Staten Island, N. Y., will take bids until Sept. 18 for six fuel oil and 14 illuminating oil tanks, as set forth in proposal 13215.

The Alpha Electric Co., 151 West Thirtieth Street, New York, has leased the building at 396-402 Eleventh Avenue, totaling about 50,000 sq. ft., for a new works and distributing plant.

The Leonard Oil Development Co., care of R. H. Weatherhead, Jr., syndicate manager, 61 Broadway, New York, is disposing of a stock issue of $1,400,000, the proceeds to be used for the installation of machinery and development of company properties in Colombia and Ecuador, including drilling equipment, pumping machinery, etc. John W. Leonard, Washington, Pa., is president.

The board of directors, Masonic Home, Utica, N. Y., will build a new refrigerating and cold storage plant, with warehouse, to cost about $100,000, including equipment. H. P. Knowles, 21 West Forty-ninth Street, New York, is architect.

Leon Nadel, New York, has leased the building at the southwest corner of Whitlock and Bryant Avenues, on site 140 x 150 ft., for an automobile service and repair works.

The Department of Police, 240 Center Street, New York, will build a two-story garage, with machine shop and repair department, at Richmond Terrace and Wall Street, St. George, S. I.

The Wire Wheel Repair Co., 148 West Fifty-fifth Street, New York, has leased the two-story building at 137 West Fifty-sixth Street for a new plant. The structure will be remodeled.

The Schaeffer & Budenberg Mfg. Co., 338 Berry Street, Brooklyn, manufacturer of thermometers, engineering specialties, etc., has been consolidated with the American Steam Gage & Valve Mfg. Co., 208 Camden Street, Boston, manufacturer of a similar line of products. Both plants will be continued in operation.

The New York Central Railroad Co., Grand Central Terminal, New York, will convert its electric generating plant at Yonkers, N. Y., for oil-burning instead of coal. Plans for the new installation are being completed.

Officials of the Sinclair Consolidated Oil Corporation, 45 Nassau Street, New York, have organized the Mammoth Oil Co., under Delaware laws, with capital of $200,500,000, as a subsidiary organization. The new company will operate properties, refineries, etc., in the Teapot Dome fields, Wyoming.

The M. W. Kellogg Co., 117 Westside Avenue, Jersey City, N. J., manufacturer of power plant specialties, piping, etc., has filed plans for a one-story addition, to cost about $150,000, including equipment.

The B. C. Tillingehast Rubber Mfg. Co., Stockton, N. J., recently organized with a capital of $100,000, has acquired the plant of the Stockton Rubber Co. from the receiver. The mill has been closed for more than a year and will be remodeled and improved; new machinery to cost about $30,000 will be installed. It is expected to have the plant ready for operation late in October. William J. McLaughlin is vice-president and general manager, and Dominick Price, secretary and treasurer.

The Hackensack Improvement Commission, Hackensack, N. J., will receive bids until Sept. 25 for pumping equipment, motors and switchboards, to be installed in the municipal sewage plant now in course of construction. Lemuel Lozier, room 3, Bank Building, Main and Mercer Streets, is engineer.

Fernando C. Mesa, Newark, operating an ammunition plant on Chancellor Avenue, Irvington district; R. D. Mesa and Hugo F. Bente have acquired the plant of the Independent Lamp Works, 80 Bergenline Avenue, Union, N. J., from Isadore Haber, receiver. The new owners will reorganize the company and operate the works for the manufacture of incandescent electric lamps.

The Pennsylvania- Jersey Power Co., Jersey City, N. J., recently organized with a capital of $125,000, is planning the construction of a hydroelectric power plant on the Delaware River. The company is headed by Alfred B. Nelson, Charles W. Alpaugh and H. Otto Wittpenn, and represented by Frederick W. Rugge, 75 Montgomery Street, Jersey City.

The J. W. Murray Mfg. Co., 1975 Clay Street, Detroit, manufacturer of automobile bodies and fenders, has leased a portion of the plant of the Durant Motors, Inc., Elizabeth, N. J., for a branch plant. The works will be devoted to the manufacture of bodies and fenders for the Star automobile and other Durant cars. Equipment will be installed to provide for the employment of about 500 men.

The Department of Streets and Public Improvements, City Hall, Newark, Thomas L. Raymond, director, will receive bids until Sept. 21 for a quantity of castings for Watson wagons used by the department.

Charles H. Bennett, 39 Saybrook Place, Newark, N. J., has plans under way for a new two-story automobile service and repair works, to cost about $100,000. Guilbert & Betelle, 546 Broad Street, are architects.

The Newark Automobile Corporation, 436 Clinton Avenue, Newark, will erect a new two-story building at Clinton Place and Quitman Street, to include service and repair departments, estimated to cost about $50,000.

Chicago

CHICAGO, Sept. 11.

MACHINE tool sales have been comparatively light the past week, although considerable business is at the point of closing. General machine shops are taking little interest in the market, but further orders are expected from the railroads and some of the larger industries. The Chicago, Burlington & Quincy will buy against its machine tool lists soon. The Atchison, Topeka & Santa Fe has purchased two milling machines against its old inquiry and still has one or two additional tools to purchase. The Studebaker Corporation, South Bend, Ind., has practically completed buying for its No. 2 plant, but has commenced the construction of an addition to its No. 1 plant. This increased capacity will be used for the manufacture of bodies and springs, and considerable equipment is to be bought. The Nash Motor Co. will duplicate some of its machine tool equipment at its Milwaukee plant, but has not yet done any buying. The International Harvester Co. continues to place orders for its local tractor plant, although some call for special purpose machines, a local tool manufacturer having been awarded an order for several special boring machines. The company looks forward to good business in 1923 and is expected to purchase considerably more machine tool equipment. The Universal Portland Cement Co., Buffington, Ind., has finally purchased a few machines, involving about $7,000, which were listed in an inquiry issued last spring. The Chicago, Rock Island & Pacific is also displaying an interest in a few items on a list which it put out months ago.

Further price advances are reported. The Cincinnati Milling Machine Co. has readjusted its prices, effective Sept. 15, advances ranging from 10 per cent up. The Cincinnati Shaper Co. will advance prices about 20 per cent, effective Oct. 1. The Universal Boring Machine Co., Hudson, Mass., has raised prices on horizontal boring mills approximately 10 per cent.

The remaining electric traveling cranes on the Burlington inquiry have not yet been purchased. The Chicago & North-

western has ordered a 1½-yd. bucket coal handling gantry crane, 60 ft. between legs, from the Milwaukee Electric Crane & Mfg. Co. The crane will be leased to the Armour Grain Co. for use at the large grain elevator at South Chicago.

Stephen & Wolff, Inc., Buchanan & Loomis Streets, Rockford, Ill., recently incorporated with $25,000 capital stock, has taken over the former business of Stephen & Wolff and is leasing a small foundry at this location for the manufacture of dental flasks, articulators, bolts for dental flasks, and a general line of bronze, brass, aluminum and white metal castings. The company expects to purchase an engine lathe and several milling machines and turret lathes.

The Electric Fireplace Mfg. Co., 3950 Prairie Avenue, Chicago, recently incorporated with $20,000 capital stock, has leased a plant at the address given for the manufacture of electric fireplaces. No additional manufacturing equipment will be purchased for a time. The officers include Daniel L. Carlin, Daniel N. Meany and J. T. McDermott.

The Imperial Clock Co., Collinsville, Ill., recently incorporated with $28,000 capital stock, has leased a plant at the corner of Main Street and Morrison Avenue, containing about 4000 ft. of floor space. Self-winding weight-driven clocks will be manufactured. The company will use about three multiple-spindle high-speed drill presses, three precision lathes to cost about $2,000 each, gear cutters, milling machines, screw machines, saws, grinders, punch presses and woodworking machines. The officers are J. W. Wick, president, who is also president of Wick Pipe Organ Factory, Highland, Ill.; R. G. Kneedler, vice-president, and Arno Fowler, secretary and treasurer, who is also superintendent in active charge of the management of the business.

The Mid-West Boat & Barge Co., Inc., Grafton, Ill., recently incorporated with $50,000 capital stock, will manufacture boats, barges, tanks, bridges, boat equipment and supplies, structural steel of all kinds, sheet metal work, life boats, work boats and life rafts. A plant containing 25,000 sq. ft. of floor space has been leased at Water Front and Oak Streets. Equipment has been purchased. Officers are Albert A. Coyle, president; John F. Erdelen, vice-president; Samuel Edwards, secretary and treasurer, and Maurice Killeen, manager.

The Acme Tool Co., West Allis, Wis., recently incorporated, has leased buildings at 487-495 Fifty-sixth Avenue, West Allis, Wis., and will manufacture a full line of mason's, carpenter's and cement finisher's tools. The plant is fully equipped for the time being. Officers are J. F. Schnaufer, president; P. H. Mayes, vice-president and George Hoffmann, secretary and treasurer.

The Holmes Projector Co., recently incorporated with $30,000 capital stock, has leased a plant at 432 West Superior Street, Chicago, and will manufacture a motion picture machine. Equipment has been purchased. Officers are C. J. Holmes, president; A. B. Gould, vice-president, and C. M. Swan, secretary and treasurer.

Snow Brothers, automobile dealers, 1011 South Boulevard, Oak Park, Ill., have let contract for a one-story service station and garage, 66 x 165 ft., to cost $50,000.

Luther Brothers, 3523 North Cicero Avenue, Chicago, are asking bids through an architect on a one-story garage, 100 x 150 ft., to cost $60,000.

The Bates Water Bag Co., 7310 South Chicago Avenue, Chicago, will build a two-story factory, 100 x 120 ft., at 8232-40 South Chicago Avenue, to cost $60,000.

The Florence Art Co., 671 West Ohio Street, Chicago, manufacturer of lamp standards, book ends, and candle sticks, from composition material, is receiving bids through Michin, Spitz & Co., 19 West Jackson Boulevard, on a four-story factory, 50 x 108 ft., in North California Avenue and Stave Street, to cost $150,000.

The General Porcelain Enameling Co., 4554 West Congress Street, Chicago, has let contract for a one-story factory, 125 x 170 ft., at 4101-29 Parker Avenue, to cost $48,000.

The Western Electric Co., Hawthorne, Ill., will commence work Sept. 15 on a one-story building, 175 x 556 ft., for the manufacture of heavy rods and wire. The structure will cost $1,000,000.

The Reynolds Wire Co., Dixon, Ill., is completing plans for a new four-story factory, 150 x 150 ft., and will take bids at once. The W. W. Beach Co., Warnock Building, Sioux City, Iowa, is engineer.

The Common Council, Loveland, Colo., is planning for the construction of a hydroelectric power house on the Big Thompson River, Loveland Canyon, estimated to cost close to $400,000, including equipment. L. C. Osborn is engineer.

George McArthur & Sons, Baraboo, Wis., operating the Baraboo Towel Mills, are having plans completed for a new hydroelectric power plant on the Baraboo River. The intiial unit will cost about $30,000.

The Perfection Radio Laboratories Co., 525 Kenilworth Court, Clinton, Iowa, manufacturer of wireless equipment, has preliminary plans under way for a new two-story factory, 100 x 300 ft., to cost $100,000, including machinery. Barger & Musse, 1010 South Fourth Street, are engineers.

A. R. Jensen, Albert Lea, Minn., is arranging a list of equipment for installation in a local automobile service and repair works.

The Post Office Department, Washington, is arranging for the erection of a new aircraft plant at Broadview, Ill., for the Chicago mail service. It will comprise an assembling plant, 40 x 100 ft.; aircraft factory, two stories, 100 x 140 ft., with machine shop, wood-working and other departments, and general warehouse. A power house will be equipped and two hangars, each 100 x 100 ft., constructed. The general superintendent, room 320, Post Office Building, Washington, is in charge.

The Herrick Refrigerator Co., Waterloo, Iowa, has acquired a site for a two-story addition, 42 x 80 ft., with one-story structure adjoining, 32 x 50 ft., estimated to cost about $30,000.

The Waukegan Generating Co., Waukegan, Ill., has plans nearing completion for a new steam-operated electric power house on Dewey Street, estimated to cost in excess of $600,000. The initial unit will have a capacity of 25,000 kw. Sargent & Lundy, 72 West Adams Street, Chicago, are mechanical engineers.

The board of directors, North Shore Sanitary District of Lake County, 295 Anderson Building, Lake Forest, Ill., will receive bids until Sept. 28 for pumping machinery, motors, tanks, filters and other equipment in connection with the two new sewage treatment plants to be constructed. Pearse, Greeley & Hansen, 39 West Adams Street, Chicago, are consulting engineers.

The State Highway and other departments, Pierre, S. D., A. C. Hunt, Secretary of State, have commissioned J. C. Buckbee & Co., 38 South Dearborn Street, Chicago, engineers, to prepare plans for the proposed State-owned cement manufacturing works at Rapid City, S. D., estimated to cost close to $2,000,000, including machinery.

A vocational department will be installed in the new high school to be erected at Lake City, Iowa, for which bonds for $100,000 will be voted at a special election, Sept. 15. William Gordon, Hubbell Building, Des Moines, Iowa, is architect.

Philadelphia

PHILADELPHIA, Sept. 11.

A FIVE-STORY factory, 75 x 160 ft., to be erected by Joseph J. Greenberg, Morris Building, at Broad and Thompson Streets, has been leased by the Nash Automobile Co., Philadelphia, for local headquarters, with service, repair and parts departments. Bids for construction will be asked at once.

The Autocar Co., Ardmore, Pa., manufacturer of motor trucks, is disposing of a preferred stock issue of $1,000,000, a portion of the proceeds to be used for extensions and additional working capital.

The L. H. Gilmer Co., Cottman and Keystone Streets, Philadelphia, manufacturer of belting, etc., has plans under way for an addition. A power house will also be built. Norman Hulme, 1524 Chestnut Street, is architect.

The Department of Supplies, Board of Education, Nineteenth and Chestnut Streets, Philadelphia, is planning to purchase lathes, drill press, jaw chucks, etc., for the vocational department at one of the city schools.

The Pennsylvania Railroad Co., Broad Street Station, Philadelphia, is taking bids until Sept. 14 for new repair shops at Enola, Pa., for steel freight work. A. C. Shand is chief engineer.

The Bureau of Accounts and Supplies, Navy Department, Washington, will receive bids until Sept. 26 for 200 storage batteries for the Philadelphia Navy Yard.

Alfred Box & Co., 813 North Front Street, Philadelphia, manufacturer of hoisting machinery and parts, cranes, etc., has awarded contract to the John N. Gill Construction Co., Otis Building, for a new building at Janney and Ontario Streets.

The Trenton Patent Mfg. Co., 219 Park Street, Trenton, N. J., manufacturer of metal products, has plans for a new factory at East Trenton, where a site has been acquired, for the manufacture of a special cylinder grinding machine, new type piston rings, and kindred specialties. The company has arranged for an increase in capital from $200,000 to $500,000. W. H. Jaeger is president and treasurer.

The Magnetic Pigment Co., Cass Street, Trenton, N. J., has filed plans for an addition, estimated to cost $50,000.

The Hinde & Dauch Paper Co., Gloucester, N. J., manufacturer of corrugated paper products, will build a one-

story addition, 60 x 140 ft., to be equipped for taping, slitting and other operations. Headquarters of the company are at Sandusky, Ohio.

The Hummel Electric Steel Foundry Co., Conshohocken, Pa., has acquired the plant and business of the Conshohocken Electric Steel Foundry, which it will continue as a branch works. Improvements are planned. The two organizations will be consolidated.

Samuel H. Bell, Reading, Pa., is negotiating for the establishment of a plant to manufacture inner tubes and other rubber specialties.

A one-story power house will be constructed by the Gilbert Wall Paper Co., 728 Linden Avenue, York, Pa., in connection with its new plant. J. A. Dempwolf, Casset Building, is architect.

A vocational department will be installed in the new high school to be constructed at Dallas, Pa., estimated to cost about $150,000. The Board of Education will select an architect to prepare plans at an early date.

The Board of Cumberland County Commissioners, 32 West High Street, Carlisle, Pa., will take bids at once for a central power house and heating plant for the County institutions. Frank G. Fahnestock, Jr., Patriot Bldg., Harrisburg, Pa., is architect.

Vocational departments will be installed in the two new junior high schools to be erected at Lancaster, Pa., estimated to cost about $450,000, each, for which bonds have been voted. The Board of Education will complete plans and commence work at an early date.

C. K. Stadler, Scranton, Pa., head of the C. K. Stadler Co., recently organized, has acquired a site for a factory to manufacture iron and steel products. Plans will be prepared at an early date.

The Holmes Garage Co., West Fairview, Pa., is planning to rebuild its service and repair works recently destroyed by fire. The loss included tools and equipment.

The Lowhill Power & Light Co., Lowhill, Pa., is being organized by C. M. Walters, L. K. Bingaman and P. B. Sawyer, all of Allentown, Pa., to build an electric light and power plant and system in Lowhill Township. The same interests are also organizing the Heidelberg Light & Power Co., to operate a plant and system in Heidelberg Township. The companies are represented by Thomas J. Perkins, Allentown.

The Standard Provision Co., 212 North Front Street, Philadelphia, will install an ice and refrigerating plant in its three-story packing house, 70 x 160 ft., at Willow and Callowhill Streets, estimated to cost $150,000. Conveying and other mechanical apparatus will be installed.

Gaul, Derr & Shearer, 212 North Broad Street, Philadelphia, will build a two-story automobile service and repair works, 56 x 105 ft., at Fairmount Avenue and Sixteenth Street, estimated to cost $100,000. Durham Brothers, 1609 Sansom Street, are architects.

The Phoenix Portland Cement Co., Real Estate Trust Building, Philadelphia, with plant at Nazareth, Pa., will build a power house, machine shop and other buildings in connection with its new plant at North Birmingham, Ala., estimated to cost in excess of $2,000,000. Lindley C. Morton is president, and R. S. Scott, consulting engineer.

Buffalo

BUFFALO, Sept. 11.

CONTRACT has been awarded to John A. Zoll, 398 Bird Avenue, by the Angola Tire & Rubber Co., 270 North Division Street, Buffalo, for a one story addition, 30 x 80 ft.

The General Metalsmiths, Inc., 313 Prendergast Avenue, Jamestown, N. Y., manufacturer of architectural and other bronze, copper and metal products, has awarded contract to Chapman & Graham, 132 Blackstone Avenue, for a new one-story plant, 60 x 250 ft., to cost about $140,000, including equipment. B. C. Davis is general manager.

T. W. Warner, vice-president Durant Motors, Inc., 1819 Broadway, New York, has acquired at a public sale the plant of the New Process Gear Corporation, Syracuse, N. Y., a subsidiary of the Willys Corporation, for $1,904,000. The purchase, it is said, has been made for individual account. The plant will be continued in operation and tentative plans are under consideration for enlargements.

Klepfer Brothers, 1029 Main Street, Buffalo, are taking bids for a two-story automobile service and repair building, 235 x 570 ft. Albert H. Hopkins, 447 Main Street, is architect.

The Carborundum Co., Niagara Falls, N. Y., manufacturer of abrasive products, has awarded contract to the Turner Construction Co., 242 Madison Avenue, New York, for an addition, 50 x 60 ft.

The Tonawanda Board & Paper Co., Tonawanda, N. Y., operating on Goose Island, is planning for the construction of a new water power plant, estimated to cost $50,000. Maurice W. Simon is president..

Vocational departments will be installed in the two high schools to be erected at Jamestown, N. Y., to be known as the North and South Junior high schools, each two stories and basement, 150 x 190 ft., and 150 x 185 ft., respectively, for which bids on a general contract will be asked at once. The schools will cost $375,000, and $335,000, respectively. Guilbert & Betelle, 546 Broad Street, Newark, N. J., are architects.

The Syracuse Intercepting Sewer Board, room 104, City Hall, Syracuse, N. Y., will receive bids until Oct. 10 for equipment for the pumping station now in course of construction, including four 24 in. centrifugal pumps, direct-connected to 75-hp. variable speed motors; priming pumps and sump pumps; 10-kw. motor generator sets; switchboard and control mechanisms, hydraulically operated sluice gate valve, and three electrically operated sluice gate valves; one 7½-ton, hand-operated, traveling crane; tramrail, with electrically operated hoist and ½-cu. yd. capacity clam shell bucket, piping, wiring, etc. Harry J. Hamlin is secretary.

The Board of Education, Lockport, N. Y., is arranging a list of metal-working and other equipment for installation in the vocational shop at the Chestnut Street school.

J. B. White, Bemus Point, N. Y., has plans in preparation for a two-story automobile service and repair works. Johnson & Ford, Fenton Building, Jamestown, N. Y., are architects.

The Globe Malleable Iron & Steel Co., 101 Greenway Avenue, Syracuse, N. Y., is planning for the erection of an addition to be used for the most part for the manufacture of oil-operated engines and parts. H. E. Elmer is treasurer and general manager.

The Board of Public Works, North Tonawanda, N. Y., has plans nearing completion for the installation of three lift pumping stations, with electrically operated machinery, estimated to cost $50,000.

Christian Schlicker, 12 Bloomingdale Street, Rochester, N. Y., is planning to purchase precision and other equipment for the manufacture of surgical instruments.

A vocational department will be installed in the new high school to be erected at Attica, N. Y., for which bonds for $262,000 have been voted.

New England

BOSTON, Sept. 12.

WITH the month almost half over, September promises to be an unprofitable period for machine tool dealers in this section. The only sale of importance reported the past week was a 90-in. driving wheel lathe purchased by the Boston & Albany Railroad for its Springfield shop. Sales of individual tools of much less value are noted, but the aggregate is not more than a dozen. Garages predominate among the purchasers of used equipment. Reports from machine tool builders are more encouraging than from dealers. Prices on new machine tools hold firm. The cost of castings, labor, etc., has reached a point where production and selling prices are close. It is difficult to size up used tool prices because of the inactivity in the market.

Small tools continue to move fairly well, but not as freely as last month. Prices are steadily maintained. Manufacturers of files have advanced prices 10 per cent.

Bids have closed on a proposed plant, three stories, 60 x 240 ft., to be erected at Attleboro, Mass., by the Hartley Clock Co., 68 Devonshire Street, Boston.

The H. & B. American Machine Co., Pawtucket, R. I., has awarded contract for a one-story addition, 100 x 280 ft., to its Attleboro plant.

J. E. Conant & Co., Lowell, Mass., auctioneers, report that approximately $236,000 in real estate, machinery and mechanical equipment was disposed of at the recent sale of the Morris Metal Products Co. Bridgeport, Conn., plant.

Some New England builders of wood-working machinery are busy and instances are noted where work has been given to outside firms in an effort to keep up with orders. Trade schools and foundries are among the largest buyers of such equipment. The Board of Education, Westfield, Mass., has taken bids for a considerable amount of wood-working and pattern making equipment for a trade school.

The Westinghouse Electric & Mfg. Co., Pittsburgh, has leased 10,000 sq. ft. of space in the factory of the Bridgeport Engineering Co., Seymour Street, Stratford, for the establishment of a service and repair plant for the Naugatuck Valley

district. L. D. Canfield, district sales manager in charge of the New York territory, will have the supervision of the new plant.

The Belknap Mfg. Co., 149 Water Street, Bridgeport, Conn., manufacturer of steam and water goods, etc., has purchased the machine shop of the former Morris Metal Products Co., on Union Avenue. It is two stories, 190 x 375 ft., of brick and steel. Price is said to be $100,000. The Belknap company is moving from its factory on Water Street.

The Salmon Falls Mfg. Co., cotton goods, Salmon Falls, N. H., has awarded contract for the construction of the new hydroelectric power station to the Central Engineering & Construction Co., Central Falls, R. I. It will be one story, 30 x 80 ft., of reinforced concrete, and will cost about $250,000. C. T. Main, 200 Devonshire Street, Boston, is the engineer.

The Boston Sand & Gravel Co., 88 Broad Street, Boston, will build a new one-story machine shop on Condor Street, East Boston, to cost about $13,000. P. F. Ayer is secretary.

The Shambow Shuttle Co., Woonsocket, R. I., manufacturer of textile equipment, has acquired the plant of the Saluda Co., near Greenville, S. C., for the establishment of a branch plant. The present buildings will be remodeled.

The Westfield Machine Co., Westfield, Mass., manufacturer of wireless equipment, etc., is said to be planning to rebuild the portion of its factory destroyed by fire Aug. 15.

Herbert B. Rust, Concord, N. H., and associates, have made application for permission to construct a hydroelectric power plant on Ayer's Island, Penigewasset River, near Bristol, N. H., to cost close to $1,000,000, including dam and transmission system.

H. Frederick Hadden, South Berwick, Me., is in the market for a machine to turn hammer and axle handles.

The Board of Contract and Supply, Providence, R. I., will install two portal gantry cranes at the municipal wharf, Fields Point.

Pittsburgh

PITTSBURGH, Sept. 11.

THE local machine tool trade still is sustained by hope rather than performance. There is no lack of inquiry and some prospects which run into fairly large sums of money have been quoted against, but orders for the most part are for individual tools and generally out of dealers' stocks. Dealers having tools, which they have carried for some time, have been making an effort to clean them out and some extremely low prices have been named. With manufacturers' quotations showing a strong upward tendency, prices quoted on dealers' stocks have been exceptionally attractive. As far as results are concerned, however, buyers have figured the low prices to mean that the tools were out of date and have been cautious. The demand does not yet appear to be broad or strong enough to sustain advances in quotations and it is admitted that on recent business competition ruled the prices that were paid.

In heavy equipment the past week has been featured by the placing of the mills and drives for the new sheet mill of the Weirton Steel Co., Weirton, W. Va., the mills being awarded the United Engineering & Foundry Co., while the drives, two 1200-hp. motors, equipped with liquid slip regulators, will be furnished by the Allis-Chalmers Mfg. Co. The Allis-Chalmers Mfg. Co. also has taken a 100-hp. motor for a mill drive for the American Nickel Corporation, Hyde, Pa. The Westinghouse Electric & Mfg. Co., recently was awarded a 3000-kw. turbo-alternator by the U. S. Coal & Coke Co., a Steel Corporation subsidiary, Gary, W. Va. The crane market is slow as far as sales go, but there seems to be no decline in inquiry and cranes for the sheet mill of the Weirton Steel Co. and for the Granite City, Ill., plant of the National Enameling & Stamping Co. are expected to be placed this week.

The Gifford-Wood Co., 26 Second Hill, Hudson, N. Y., manufacturer of elevating and conveying machinery, ice machinery, etc., has purchased property at Hulton, near Pittsburgh, for a branch plant. The present buildings will be remodeled and operations commenced at an early date. About 150 men will be employed for initial production. William B. Wood is president, and Benjamin Gifford, vice-president.

The Chevrolet Motor Co., Baum Boulevard, Pittsburgh, has leased two floors in the building at Bennett Street and Girt's Alley, for extensions in its service and repair departments.

The board of directors, Duquesne University, Pittsburgh, will build a new power house to cost about $150,000, including gymnasium building, adjoining.

The Keystone Garage, Monongahela, Pa., will soon take new bids for a two-story service and repair works, 60 x 200 ft., estimated to cost close to $50,000. C. K. Downer, 248 Boylston Street, Boston, is architect.

The West Penn Traction & Water Power Co., West Penn Building, Pittsburgh, has tentative plans for a new power house near Charleroi, Pa., to cost about $850,000, including transmission system.

E. M. Bowen, Oil City, Pa., operating a Ford automobile agency, is taking bids for a three-story service and repair works, 70 x 80 ft., estimated to cost $45,000. W. H. Crosby, Masonic Building, is architect.

The Buick Motor Co., Baum Boulevard and Euclid Street, Pittsburgh, has awarded contract to Conley & DeMey, Pittsburgh, for a new building for local headquarters, including service and repair departments, etc., estimated to cost $200,000.

The Beech Bottom Power Co., Beech Bottom, W. Va., is planning to rebuild the portion of its power house destroyed by fire Sept. 1, with loss estimated at about $30,000, including equipment.

The Centre Foundry & Machine Co., 2017 Main Street, Wheeling, W. Va., is planning for the installation of additional equipment at its Warwood, W. Va., foundry.

R. E. Matticks, Logan, W. Va., is preparing plans for a three-story automobile service and repair building, 52 x 120 ft., to cost $50,000. Meanor & Handloser, Robson-Pritchard Building, Huntington, W. Va., are architects.

The Guyan Machine Shops, Logan, W. Va., are making inquiries for a slitting shear and punch, to handle ½-in. plate.

The A. C. Love Co., Huntington, W. Va., is in the market for a 40-hp. locomotive boiler with engine.

The Ellwood Steel Corporation, Elwood, Pa., plans the installation of new wire-drawing and other equipment at the plant of the Sharon Pressed Steel Co., recently acquired.

Detroit

DETROIT, Sept. 11.

INQUIRIES for machine tools have been very light since the latter part of August. That month, however, showed a good volume of business, one representative reporting the best business for any month this year. The Ford Motor Co. notified machine tool manufacturers that it would receive all orders placed and continue repairs on all machinery.

Dodge Brothers, Detroit, have announced that work will begin immediately on the construction of an eight-story addition to their plant, to cost about $1,500,000. The new building will contain approximately 500,000 sq. ft. and will be 400 ft. long. It will be used entirely for manufacturing purposes and will enable the company to increase its production from 650 to 900 or 1000 cars per day.

Campbell, Wyant & Cannon, Muskegon, Mich., are completing the second unit of their foundry, on which operations were suspended in 1920, and expect to take off the first heat the latter part of September. The plant is being equipped with special machinery for the production of automobile castings and will cost $1,500,000.

The Green Wrench Co., Marshall, Mich., has been incorporated with a capital stock of $50,000 and will let contracts for drop forging and screw machine work. Other machining and assembling will be done at the company's plant. It is in the market for disk grinders, milling machines, geometric threading machines, light horizontal drilling machines and supplies. Paul G. Green is president.

The Minneapolis, St. Paul & Sault Ste. Marie Railroad Co., Minneapolis, Minn., is planning to rebuild its shops at Gladstone, Mich., destroyed by fire a few months ago. The new buildings will include engine house, machine shops, rail shop, assembling works and, with machinery, will cost approximately the amount of the fire loss.

The Hayes Wheel Co., Jackson, Mich., will commence the immediate erection of a one-story addition, 100 x 160 ft., and one-story power house, 50 x 60 ft., estimated to cost in excess of $200,000, with equipment. The company has closed contracts with the Durant Motors, Inc., New York, for wheels for the Durant, Star and other automobiles under this management.

The Munising, Marquette & Southeastern Railway Co., and the Lake Superior, Ishpeming Railway Co., affiliated roads, both of Marquette, Mich., have plans for new shops on local site, including general machine repair shop, coach works, steel

car shops and other buildings, estimated to cost $300,000, with machinery. H. R. Harris is general manager of both roads, which are operated by the Cleveland-Cliffs Iron Co., Cleveland.

The J. & S. Plating Co., Jackson, Mich., recently organized, will operate a plant at 112 East Washington Street for the manufacture of plated metal products, primarily for automobile service. George J. Sights is general manager.

Baltimore

BALTIMORE, Sept. 11.

THE Smith & Williams Shipbuilding Co., Salisbury, Md., has acquired about 8 acres adjoining its plant for extensions. Plans are under way for a new cradle railroad, 250 ft. long, with hauling capacity for 1000-ton vessels and smaller, with additional construction and repair shops, estimated to cost about $40,000.

The Richmond Pressed Metal Works, Inc., 601 Stockton Street, Richmond, Va., has awarded contract to the F. H. Boatwright Co., Richmond, for a new one-story plant, 110 x 160 ft., to cost about $30,000. The installation will include shears, punch presses, plating equipment etc. The company recently increased its capital to $150,000 for expansion.

The Parker Mfg. Co., Suffolk, Va., manufacturer of carriages, wagons and parts, has tentative plans for rebuilding the portion of its plant recently destroyed by fire with loss of about $50,000. The new structure will cost approximately a like amount, including equipment. C. E. Parker is head.

The Wilmington Sugar Refining Co., South Wilmington, Del., is perfecting plans for the early resumption of construction of its local refinery, held in abeyance for a number of weeks. The proposed buildings with machinery will cost in excess of $5,000,000.

A vocational department will be installed in the new two-story high school, 80 x 280 ft., to be erected at Claymont, Del., estimated to cost $275,000, for which bids will be called at once. Coffin & Coffin, 522 Fifth Avenue, New York, are architects.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until Oct. 3 for an industrial electric truck for the Mare Island Navy Yard, San Francisco, as set forth in schedule 136; until Sept. 19, for 19,500 ft. of electric cable for the Portsmouth, N. H., Navy Yard, as specified in schedule 128.

Lane Brothers, 3117 West North Avenue, Baltimore, are completing plans for a two-story automobile service and repair building, 50 x 150 ft., on North Avenue. Bids will soon be asked by W. B. Gerwig, 600 Equitable Building, architect.

The Youghiogheny Power & Electric Co., Rockwood, Pa., is perfecting plans for hydroelectric power plants on the Youghiogheny River, near Oakland, Md., and on Muddy and Deep creeks, in the same district, estimated to cost in excess of $500,000.

The Potomac Public Service Co., Hagerstown, Md., has acquired property at Williamsport, Md., for a new steam-operated electric generating plant, estimated to cost approximately $1,500,000, with machinery and transmission system. The company is a subsidiary of the American Water Works & Electric Co., 50 Broad Street, New York.

The Saco-Lowell Shops, Charlotte, N. C., manufacturers of textile machinery, have awarded contract to T. C. Thompson & Brother, Charlotte, for a two-story machine shop, 80 x 160 ft.; repair and distributing shop and office at Mint and Commerce Streets, estimated to cost about $150,000. Headquarters of the company are at 77 Franklin Street, Boston. Lockwood, Greene & Co., Atlanta, Ga., are architects and engineers.

A vocational department will be installed in the new high school to be constructed at Edgecombe, N. C., estimated to cost $90,000, for which bids have been asked. The Board of Education, Tarboro, N. C., R. E. Sentell superintendent, is in charge. J. M. Kennedy, Merchants' Bank Building, Raleigh, N. C., is architect.

The Norfolk & Western Railway Co., Norfolk, Va., will install new electrically-operated coal dumping and handling machinery at its Pier No. 3, to double, approximately, the present capacity. It will also make improvements in install new machinery at its Lamberts Point coaling piers. The entire work will cost approximately $600,000.

The Shambow Spool Co., Greenville, S. C., has tentative plans for rebuilding the portion of its wood-working plant destroyed by fire Aug. 28 with loss estimated at $60,000, including machinery. The company formerly was known as the Greenville Spool & Mfg. Co.

The Lamar Welding Co., Atlanta, Ga., recently organized, has acquired the plant of the Standard Gas Products Co., formerly known as the Bird-Wilcox Co., and will operate a welding and general repair works. John Lamar heads the company.

John B. Billey, Richmond, Va., will build a two-story addition to his automobile service and repair works at 408 North Third Street, estimated to cost about $15,000, exclusive of equipment.

The Board of Commissioners, St. Michaels, Md., is disposing of a bond issue of $20,000, the proceeds to be used for extensions and improvements in the municipal electric plant and system. Thomas H. Sewell is town clerk.

The Purchasing Agent, Post Office Department, Washington, will take bids until Sept 18, for 500 boxes of lock washers, ¾ x 3/16 x 3/32 in.

The Dawson Variety Co., Dawson, Ga., is planning to rebuilt its machine shops recently destroyed by fire. An official estimate of loss has not been announced.

A vocational department will be installed in the new junior high school to be erected at Atlanta, Ga., to be known as the Northwest Junior High School, for which bids have been asked. It will cost in excess of $190,000. Marye, Alger & Alger, Inc., Atlanta, are architects.

The Georgia Cement & Stone Co. Portland, Ga., is remodeling its works and plans to place the mill in operation at an early date. New equipment will be installed. The company was acquired recently by the Nicholson Corporation. John A. Blank is general superintendent.

Walden & Massengill, McIntyre, Ga., recently organized, will operate clay properties in this section and contemplate the installation of a refinery later. The company is headed by H. A. Walden and C. G. Massengill.

Cleveland

CLEVELAND, Sept. 11.

MACHINE-TOOL business continues dull, although there seems to be a little improvement in some lines. A local manufacturer of vertical boring mills reports an increase in orders but manufacturers of turret lathes have made few sales this month. No new inquiry is coming from the railroads. A local dealer the past week booked an order for 11 lathes for equipping a new plant in Cleveland to manufacture automobile parts, and the same interest, recently reported as inquiring for about 40 machines, is understood to have also purchased eight other tools. With this exception dealers' sales were limited to single machines.

Announcements of price advances continue. The Rockford Milling Machine Co., Rockford, Ill., on Sept. 15 will advance prices 10 per cent on cone drive milling machines and 12½ per cent on single pulley drive machines. The Foster Machine Co., Elkhart, Ind., has announced a slight advance on its line of screw machines.

Locomotive crane builders report an improvement in inquiries. The Alpha Portland Cement Co. has placed an order with the Whiting Corporation for a 30-ton locomotive crane.

The Otis Steel Co. continues to purchase equipment for its new plant. It has placed orders with the Alliance Machine Co., Alliance, Ohio, for eight cranes for its open-hearth blooming mill and sheet bar mill departments. The order includes a 175-ton and a 100-ton ladle crane and six cranes of 50 tons and smaller capacity. Six or eight cranes for its strip mill are still to be placed. The company has placed with the Mackintosh Hemphill Co. an order for a 24-in. sheet bar mill and recently placed an order for a 40-in. blooming mill with the same company.

The American Coach & Body Co., Cleveland, has purchased two plants of the James Holam Mfg. Co., of that city, one at Clark Avenue and West Thirty-eighth Street, for the manufacture of automobile bodies, and the other at Clark Avenue and West Forty-first Street, to be used for a metal-working shop. The Holam company has retained a third plant on Brook Park Road.

The Industrial Tool Co., Cleveland, has been formed to engage in jobbing and special machine work and has placed orders for a number of machine tools for its plant at 5518 Euclid Avenue. George Somerfield is the manager.

The Cleveland Stone Co., Cleveland, has purchased the plant of the Sterling Grinding Wheel Co., Tiffin, Ohio, manufacturer of grinding wheels and grinding machines. The purchase of stock of some of the large owners was made recently and a few days ago the remainder of the stock of the company was purchased. The deal is reported to have

involved approximately $250,000. The new owners plan to enlarge the plant and extend the line of manufacture of abrasive wheels and materials. The Grinding Wheel company has been reorganized with the election of H. W. Caldwell, president; D. W. Walter, vice-president, and J. R. Miller, secretary. These men are respectively vice-president, president and secretary of the Cleveland Stone Co.

Milwaukee

MILWAUKEE, Sept. 11.

INCREASING activity is noted by machine-tool manufacturers so far this month which is an improvement over the average for August. Some requirements are coming from the railroads and a considerably larger volume is expected to develop when shops of the transportation companies are on a more nearly normal basis. Automotive industries are buying steadily against current needs but placing no large lots. Inquiry the past week has been more active than for about three to four weeks, probably owing to the better industrial and transportation outlook and the prospect of higher prices. Actual business, however, is slow to develop. Tool builders are able to maintain operations without any let-down, with some showing small but steady gains in schedules and working forces.

The plant and property of the Conradson Machine Tool Co., Green Bay, Wis., has been purchased by Joseph T. Ryerson & Son, Chicago, for $55,000, including the assumption of a mortgage of $10,000. It is stated, however, that the Ryerson company expects to redispose of the property, since it is not engaged in the manufacturing business. It has been marketing the output of the Conradson company since this business was established about four years ago to manufacture turret lathes and other machine tools, bearing the name Conradson-Ryerson.

The Wheary-Burge Trunk Co., Racine, Wis., has been incorporated with a capital stock of $500,000 by George W. Wheary, Harry L. Burge, Charles O. Bergener and Morton E. Walker, attorney. As previously noted, the interests which have been incorporated are establishing a factory on three floors of the former Racine-Sattley carriage works at Racine Junction, to manufacture trunks and other traveling goods. Machinery and other equipment is now being purchased.

The Sewerage Commission of Milwaukee, 508 Market Street, is asking bids until Sept. 29 for the complete equipment of a feed water softening and purification plant in connection with the steam generating plant under construction on Jones Island. John H. Fowles is secretary.

The M. Hilty Lumber Co., 3-15 Twelfth Street, Milwaukee, will build a general wood-working factory with a separate power plant representing an estimated investment of $350,000 at the east approach to the Grand Avenue viaduct. It will be of brick and mill construction, 102 x 132 ft., three stories. The power plant will be equipped with a 500-hp. uniflow type engine, two 150-hp. boilers and superheaters, and a 250-kw. generator set. Cahill & Douglas, consulting engineers, 217 West Water Street, local, are designing the power plant and will purchase the equipment.

The Board of Education, Hayward, Wis., has engaged E. F. Johnson, architect, Superior, Wis., to draw plans for a new high school, with a vocational training department, to cost not more than $150,000.

The Nekoosa Iron Works, Nekoosa, Wis., founder and machinist, has let the general contract to Manske & Henry, Wood Building, Wisconsin Rapids, Wis., for a one-story addition, 36 x 75 ft., estimated to cost $15,000 with equipment. M. J. Powers is president.

The Marathon Motor Car Co., Wausau, Wis., Ford dealer, is buying additional equipment for a $75,000 extension to its sales and service building now under construction. Miscellaneous floor equipment, shop fixtures, etc., are included in the requirements.

The Badger Cabinet Co., Plymouth, Wis., manufacturer of veneers, panels, cabinets, talking machines, etc., has decided to rebuild its factory, destroyed by fire Jan. 1 with loss of $150,000. The present investment will be about $75,000. The building will be of brick and tile, one story, 150 x 200 ft. A full complement of new machinery is being purchased.

E. H. Ramm, New London, Wis., has plans for a new garage and service shop building, 50 x 120 ft., to accommodate his branch house business at Clintonville, Wis. The cost is estimated at $20,000 complete.

The Modern Auto Parts Co., Sheboygan, Wis., has been chartered to manufacture a general line of automobile accessories, parts and specialties. It is capitalized at $18,000 and the principals are J. J. McNulty, R. P. Loop and H. J. Sieners. A small shop will be equipped at once.

The John Torrance & Son foundry, LaCrosse, Wis., was damaged about $5,000 by fire Sept. 5, but little replacement of equipment will be required, and operations have been only slightly interrupted.

W. H. St. John, 205 North Van Buren Street, Green Bay, Wis., has engaged Earl F. Miller, Inc., architect, Appleton, Wis., to design a garage and machine shop, 48 x 120 ft., part two stories and basement, to be erected in Appleton. The cost is estimated at $25,000.

The Kidwell Boiler & Engineering Co., 288-292 East Water Street, Milwaukee, has taken over the plant of the defunct Northwestern Bridge & Iron Co., at Thirty-second Street and Hopkins Road. Some re-equipment work is under way. The company specializes in the manufacture of high pressure boilers. J. F. Jackson is president and Edgar Kidwell general manager of the company.

The M. Hilty Lumber Co., 3-15 Twelfth Street, Milwaukee, will build a wood-working factory and power plant, representing an investment of $350,000, at the east approach to the Grand Avenue viaduct. It will be three stories, 102 x 133 ft., of brick and mill construction, and was designed and will be erected under the supervision of Cahill & Douglas, consulting engineers, 217 West Water Street, Milwaukee. The power plant equipment to be purchased includes a 500-hp. uniflow type engine, two 150-hp. boilers and superheaters, and a 250-kw. generator set and appurtenances.

The Hohman-Nelson Co., Eau Claire, Wis., has been incorporated with a capital stock of $14,000 to take over a foundry and machine shop business operated by A. B. Hohman and A. J. Nelson. J. G. Owen is associated with them in the development of the business. Plans for enlargement are under consideration, but details are not available.

Cincinnati

CINCINNATI, Sept. 11.

SO far this month the machinery market has not shown great activity, due to unsettled conditions as a result of the railroad strike and announcements that many manufacturing plants are about to close for lack of fuel. The tone of the market is distinctly improved, however, and a fair number of long outstanding inquiries are being closed. The certainty that prices of machine tools will advance, coupled with the announcements already made, is responsible in a large measure for a number of orders booked by local manufacturers the past week. Formal orders have not yet been received by makers who participated largely in the recent railroad buying, but these are expected this week. The only new inquiry of size comes from the Central of Georgia Railway Co., which has issued by telegraph a list of approximately 15 miscellaneous machines.

A manufacturer of boring mills has advanced prices approximately 10 per cent and it is expected that other announcements will follow shortly. The Cincinnati Milling Machine Co. has made an advance of approximately 12½ per cent on milling machines, effective Sept. 15.

Agricultural implement manufacturers report steadily increasing business, both for domestic and foreign account. Makers of wood-working machinery are running nearly full time and road-making machinery builders are operating at capacity. The foundry situation in this district shows but slight improvement, and if the Ford Motor Co. closes its plants on Sept. 16 a number of shops will be obliged to greatly reduce forces.

The Gardner-Harvey Paper Co., Middletown, Ohio, will build an addition to its plant to cost about $150,000. New paper-making machinery will be installed.

The Rayner Auto Safe Lock Co., Louisville, Ky., has been incorporated with a capitalization of $25,000 to manufacture a safety automobile lock invented by H. L. Rayner, who heads the company as president.

The Standard Bolt Corporation, Columbus, Ohio, which

was damaged to the extent of $40,000 by fire on Aug. 30, will be rebuilt. Plans have been completed for a new finishing mill to replace the one destroyed and it is expected that work will commence within the next two weeks.

Work will commence shortly on an addition to the power plant of the Dayton Power & Light Co., Millers' Ford, Ohio. The new station will house three 2000-hp. boilers, and a 20,000-kw. steam turbine. The addition will also include a completely equipped machine shop, 60 x 140 ft.

Indiana

INDIANAPOLIS, Sept. 11.

A NEW one-story plant will be erected by the Automotive Gear Co., Richmond, Ind., care of J. W. Mueller, Richmond, 400 x 600 ft., estimated to cost $45,000.

The Franklin-Indianapolis Co., Indianapolis, recently organized as a branch of the Franklin Automobile Co., Syracuse, N. Y., will establish a service and repair department in the building at 1112-14 North Meridian Street, to include a complete machine shop. H. H. Alexander and E. J. Erber head the company.

The Carbon Fire Brick & Coal Co., Carbon, Ind., will build an addition to its fire brick and refractory plant to cost about $150,000, including equipment. E. E. Dean is president.

The Yellow Cab Line, Douglas and Harrison Streets, Indianapolis, will build a one and two-story and basement automobile service and repair works, 150 x 250 ft., at Fulton and Main Streets.

The Glencoe Coal Co., operating the Glencoe mine No. 1, near Terre Haute, Ind., plans for the early rebuilding of the power house at its properties, destroyed by fire, Sept. 3.

A vocational department will be installed in the two-story high school to be erected at Evansville, Ind., 30 x 250 ft., to cost about $300,000. J. C. Llewellyn, 38 South Dearborn Street, Chicago, is architect.

The International Lead Refining Co., McCook Avenue, East Chicago, Ind., will soon commence the erection of a one-story addition, 50 x 100 ft., estimated to cost about $30,000.

J. E. Ford, Harrison and Douglas Streets, Fort Wayne, Ind., is completing plans for a two-story automobile service and repair building, 150 x 250 ft., estimated to cost $75,000. C. R. Weatherhogg, Citizens' Trust Building, is architect.

The Universal Burner Co., Logansport, Ind., recently organized to manufacture oil burners and oil-burning devices, is selecting a site for a new plant. Allen Nelson, Logansport, heads the company.

The Rochester Bridge Co., Rochester, Ind., will arrange a portion of its local works for car repair operations. A contract has been secured from the Erie Railroad for light railroad car repairs.

The Gulf States

BIRMINGHAM, Sept. 11.

PLANS are being drawn for a new plant for the Trinity Paper Mills Corporation, Dallas, Tex., organized with a capital of $6,000,000. It is estimated to cost in excess of $300,000, including machinery. J. V. Webb is president; J. M. Irwin, vice-president, and Adam H. Davidson, treasurer.

The Birmingham Stove & Range Co., Birmingham, has preliminary plans for the construction of an addition. A new department will be installed for the manufacture of gas ranges. B. H. Hartsfield is general manager.

The La Feria Water Improvement District, Cameron County No. 3, La Feria, Tex., will receive bids until Sept. 27 for a Diesel or semi-Diesel engine, direct-connected to a centrifugal volute pump. A. W. Anthor is manager.

The Kreiss Process Products Co., room 205 Graham Building, Jacksonvalle, Fla., recently organized, has plans under way for a new factory to manufacture fertilizer products. The installation will include mixing apparatus, rotary dryers, screens, etc. William B. Taber is general manager.

Fire, Sept. 5, destroyed the sugar refinery of the Elm Hall Refinery, Napoleonville, La., with loss estimated in excess of $1,000,000, including machinery. The company is operated by the I. Godchaux Sugar Co. It is planned to rebuild.

Paul O. Trahan, Gueydan, La., and associates, are organizing the Tractor Safety Attachment Co., to establish and operate a plant for the manufacture of patented mechanical specialties.

The Stringer Brothers Foundry Co., 109 North Dearborn Street, Chicago, manufacturer of cast iron plumbing products, has commenced the erection of an addition to its branch plant at Gadsden, Ala.

The Atlantic Ice & Coal Co., Montgomery, Ala., is planning the erection of a new cold storage and ice-manufacturing plant to cost about $250,000, including machinery.

The Sewerage and Water Board, New Orleans, will receive bids until Oct. 10 for one 6000-kw. steam turbine and auxiliary equipment, for municipal service. A. G. Moffat is secretary.

The Texas Power & Light Co., Dallas, Tex., has arranged for an increase in capital of $500,000, the proceeds to be used for extensions and improvements in power plants and systems. The company is operating in 90 counties of Texas. J. E. Horn is treasurer.

The Sour Lake Lumber Co., Sour Lake, La., has tentative plans for rebuilding the portion of its mill destroyed by fire, Aug. 31, with loss close to $300,000, including machinery.

Edward Michel and E. H. Madere, 205 Whitney Central Building, New Orleans, associated, are organizing a new company capitalized at $100,000, to establish and operate a plant for the manufacture of special rotating cutting equipment.

The Common Council, Monroe, La., is arranging for a bond issue of $15,000, the proceeds to be used for extensions and improvements in the municipal power plant.

The Alabama Machinery & Supply Co., Montgomery, Ala., is arranging for an increase in capital of $100,000, a large part of the proceeds to be used for extensions and improvements.

The Bacon Motor Co., Miami, Fla., has awarded contract to P. J. Davis, Miami, for a two-story automobile service and repair building, 80 x 140 ft., estimated to cost close to $90,000.

Fire, Sept. 2, destroyed a portion of the car shops and pumping plant of the Atlantic Coast Line Railroad, Lakeland, Fla. An official estimate of loss has not been made. It is planned to rebuild. Main offices of the company are at Wilmington, N. C.

The Gulf States Portland Cement Co., Demopolis, Ala., has plans for enlargements to double the present capacity of 1200 bbl. per day. Work will commence at an early date and a list of equipment prepared.

The Jarreau Motor Co., New Orleans, has acquired property at Carrollton Avenue and Fontainbleau Drive, for a two-story service and repair building, 30 x 110 ft.

Strickland & Hazard, Ripley, Miss., are planning to rebuild their lumber plant, including saw mill and planing mill, recently destroyed by fire with loss estimated at $60,000, including equipment.

The Central South

ST. LOUIS, Sept. 11.

THE Kaw Boiler Works, Parallel Avenue, Kansas City, Mo., is planning for an addition to its local works to double approximately the present capacity. The main plant and headquarters are at Kansas City, Kan.

J. C. Conley, 623 Murdock Street, Wichita, Kan., operating a general machine and repair shop, will install a new lathe, drill press and other tools.

The Arkansas Light & Power Co., Arkadelphia, Ark., is planning the installation of a hydroelectric power plant on the Illinois River, near Russellville, Ark., to include two electric generators, wate rturbines and auxiliary machinery, estimated to cost close to $100,000. Plans are also under way for a new pulverized fuel plant in the vicinity of Bernice, Ark., to utilize mine waste. H. C. Couch is president.

The Central Mfg. Co., Inc., 2521-29 Montgomery Street, St. Louis, manufacturer of electrically-operated washing machines, is planning to rebuild the portion of its factory destroyed by fire Aug. 29. An official estimate of loss has not been made.

The Theiling-Lothmann Mfg. Co., 3810 North Ninth Street, St. Louis, is considering tentative plans for rebuilding the portion of its wook-working plant destroyed by fire Aug. 27, with loss approximating $90,000, including machinery.

The Casey-Hedges Co., Chattanooga, Tenn., manufacturer of boilers, tanks, stacks, etc., has acquired over 40 acres in the Missionary Ridge section, a portion of the site to be used for a new plant.

A vocational department will be installed in the new high school to be erected at Jennings, Kan., two-stories, 61 x 132 ft., estimated to cost $80,000, for which work will commence at once. Smith & English, Nelson Building, Hutchinson Building, Hutchinson, Kan., are architects.

The Van Buren Glass Co., Van Buren, Ark., has been organized to take over the plant and business of the Arkansas Products Co., specializing in the manufacture of steam gage

tubing and other precision glass specialties. The plant, which has been closed for about a year, will be remodeled and additional equipment installed for the production of a new line of glass products. Howard Pratt is manager.

The DeLong Machine Co., East Murdock Street, Wichita, Kan., plans the installation of a lathe, drill press and other machine tools. J. F. DeLong is head.

Vocational departments will be installed in the three new junior high schools to be erected at Springfield, Mo., upon which work will be placed under way at an early date. The structures will be each three-stories, 63 x 175 ft.; 60 x 172 ft., and 60 x 170 ft., estimated to cost $180,000, $200,000 and $200,000, respectively. Earl Hawkins & Co., 400 McDaniel Building, are architects.

The Central Power & Light Co., Walnut Ridge, Ark., is arranging for the installation of additional equipment at its power plant.

The Missouri Electric Light & Power Co., St. Louis, is being organized by officials of the Union Electric Light & Power Co., to succeed the latter company, under a plan approved by the Public Service Commission. The new company will be capitalized at $25,000,000 and plans are being perfected for the expenditure of a large fund for extensions and improvements in power plants and system, including the construction of a power plant near the municipal bridge.

The Imboden Hydro-Electric Power & Mfg. Co., Imboden, Ark., recently organized with a capital of $100,000, is considering plans for the establishment of a factory to manufacture agricultural equipment. W. R. Lane is president.

The Common Council, McCracken, Kan., has plans nearing completion for a new municipal electric power plant to cost close to $50,000. The Ruckel Engineering Co., Hutchinson, Kan., is engineer.

The Meade Fibre Co., Kingsport, Tenn., is perfecting plans for erection of a factory to manufacture paper and fibre products, estimated to cost in excess of $600,000, including machinery. J. H. Thickens is general manager.

The Clover Farm Dairy Co., 785 Union Avenue, Memphis, Tenn., will build a new ice-manufacturing plant in connection with a three-story dairy, 60 x 140 ft., at Union Avenue and Walnut Street. A power plant will also be constructed. The entire works will cost about $250,000, including equipment. L. N. Leonard is general manager.

A vocational department will be installed in the new high school, 75 x 164 ft., to be erected at Coal Creek, Tenn. Manly & Young, Knoxville, Tenn., are architects.

A one-story power plant will be constructed by the Dixie Spinning Mill, affiliated with the Dixie Mercerizing Co., Chattanooga, Tenn., in connection with its new spinning mill, estimated to cost $200,000. Carter Lupton is president.

The Bevis Salt Co., Lyons, Kan., is arranging a list of power and other equipment to be installed in its addition, estimated to cost about $175,000.

The Pacific Coast

SAN FRANCISCO, Sept. 5.

PLANS are in progress by the Pacific Coast Borax Co., 2 Pine Street, San Francisco, for the first unit of its new refinery at San Pedro, consisting of a two-story building, 250 x 400 ft., with foundations to provide for three additional floors later. Albert C. Martin, 430 Higgins Building, Los Angeles, is architect.

The California Gypsum Co., National City, Cal., is perfecting plans for new works on the waterfront for the manufacture of blocks and other gypsum products, estimated to cost in excess of $75,000.

The Anaheim Sugar Co., Anaheim, Cal., has awarded a contract to G. E. Fickett, 638 South Western Avenue, Los Angeles, for a new five-story addition, 44 x 260 ft., estimated to cost about $160,000.

The Atchison, Topeka & Santa Fe Railroad Co., Kerchkoff Building, Los Angeles, has plans under way for an addition to its ice-manufacturing and car-icing plant at Bakersfield, Cal., and for the erection of a similar plant at Needles, Cal., estimated to cost about $150,000 each. The company will also rebuild the portion of its engine house and shops at the latter point, damaged by storm Sept. 2.

The Moore Shipbuilding & Drydock Co., Oakland, Cal., has been reorganized as the Moore Drydock Co., with capital of $3,000,000. Operations will be continued at the plant for new ship construction and ship repair work. The company is headed by Joseph A. Moore, Ira S. Lillick and L. H. Cromwell.

The Teetor Adding Machine Co., Pomona, Cal., has selected a site for the erection of a new plant to manufacture calculating machinery and parts. The initial works will total about 50,000 sq. ft. and with machinery are estimated to cost close to $200,000. The local Chamber of Commerce is interested in the project. C. J. Carr and J. A. Heaton are heads of the company.

The Oregon Pulp & Paper Co., Salem, Ore., will soon commence the erection of a third mill unit, to be four stories, of reinforced concrete, 75 x 80 ft., estimated to cost approximately $300,000, including machinery. Knighton & Howell, United States Bank Building, Portland, Ore., are architects.

The Grays Harbor Port Commission, Aberdeen, Wash., will receive bids until Sept. 23 for one 5-ton, mill type, traveling crane, 75 ft. span, equipped with lumber grapple. Frank H. Lamb is president.

The Webster Chair Co., Superior, Wis., is arranging for the erection of a new four-story plant, 100 x 200 ft., at Portland, Ore., on property recently acquired at Nicholai and Twenty-sixth Streets, for a Pacific Coast branch.

The Long Bell Lumber Co., Kansas City, Mo., is planning the construction of two plants on the Columbia River, one near Kelso, Wash., and the other at Rainier, Ore. A railroad line 15 miles long will be constructed from the timber properties of the company in this section. The project will cost in excess of $600,000, including machinery.

Canada

TORONTO, Sept. 11.

BUYING of one or two machine tools is still well maintained, and while inquiries calling for fairly large lists are appearing none of this business has so far been closed. Additional contracts for extensions to the Leaside plant of the Durant Motors of Canada have been placed, but nothing has so far been done in the equipment line and dealers and manufacturers are looking forward to a sizable order from this quarter. Building activities among industrial plants continue, and as many concerns have been holding back orders pending a settlement in the fuel situation it is expected that a number of these will enter the market before the end of the year. The general outlook with regard to orders and the possibility of securing fuel is having a stimulating effect on business in general and not a few industrial concerns are preparing for active operations through the winter. Prices are beginning to show an upward tendency and while increases have not been general one or two companies have announced higher quotations on their equipment.

C. Alfred Maguire, chairman of the Board of Control, Toronto, will receive bids until Oct. 3 for the supply and installation of two 2,880,000 Imperial gallon centrifugal sewage pumps and motors. Specifications can be seen at room 6, City Hall.

Graves, Bigwood & Co., Bank of Hamilton Building, Toronto, will rebuild a box factory recently destroyed by fire at Byng Inlet, Ont., and are interested in equipment.

The Anaconda American Brass Co., New Toronto, Ont., is contemplating the erection of a foundry. A. H. Quigley is general manager.

The Hull Electric Co., 117 Main Street, Hull, Que., will erect a power plant in Low Township, Que.

Contract for the construction of a power plant, dam and intake at Price, Que., for the Lower St. Lawrence Power Co., Rimouski, Que., has been awarded to the Foundation Co., Ltd., 511 St. Catharine Street West, Montreal.

The National Castings, Ltd., Belleville, Ont., is making additions to its plant and installing a Pittsburgh electric furnace and other equipment.

Considerable improvements and extensions are under way at the plant of the Electric Steel & Metals, Ltd., Welland, Ont., which is being converted for the production of manganese and other metals, heavy castings and mining equipment. The electric furnace capacity is also being increased.

Contracts for the construction of new buildings at Leaside, Ont., to cost approximately $1,000,000, for the Durant Motors of Canada, Ltd., Toronto, have been awarded. The new plant will have floor space of 500,000 sq. ft. and will be used exclusively for the manufacture of Star cars. Production for 1923 calls for 18,000 cars, of which 10,000 will be for the domestic trade and 8000 for export.

It is reported that construction will be started this season on the plant at Petrolia, Ont., for the Peninsula Sugar Co., which will cost approximately $800,000. Machinery of special design, electrically driven, will be installed and it is expected that the plant will be in operation by September, 1923.

The Imperial Radiator Co., Ltd., Toronto, an organization

formed by the bondholders of Steel & Radiation, Ltd., have taken over the assets and property of the latter company at Toronto and St. Catharines for $400,000. Steel & Radiation has been in the hands of receivers for several months, but the plant has been in operation since the first of the year. The new concern will have improved financial standing and attention will be confined entirely to the production of radiators and heating boilers. J. E. McAllister, Toronto, is president and E. T. Wingate, general manager.

IRON AND INDUSTRIAL STOCKS

No Desire to Liquidate—Prices High Owing to Production Costs

Steel and industrial stocks held by consumers may be large, but there seems to be no desire to liquidate them. On the contrary, the disposition is to build up stocks against the fully expected traffic congestion. Prices are more or less inflated owing to the increased production costs, and will likely be looking up for six or eight months, according to several estimations. Apparently both buyers and sellers have stopped to make fresh appraisals of the situation in the light of strike developments and the predicted congestion. However, the situation is full of cross currents and one view discredits the inflationary trend, holding optimistically that the usual September turn in business will show renewed vigor.

Acquired by American Brake-Shoe & Foundry Co.

The American Brake-Shoe & Foundry Co., 30 Church Street, New York, recently acquired the Ramapo Iron Works, which has plants at Hillburn and Niagara Falls, N. Y., also at Niagara Falls, Ont., and the Ajax Forge Co., with plants at Chicago and Superior, Wis. The assets of the acquired companies will be held by a new corporation to be known as the Ramapo Ajax Corporation. Announcement has been made by Marshall Field, Glore, Ward & Co. that in order to finance the purchase $2,250,000 of first mortgage, 20-year, 6 per cent sinking fund gold bonds of the Ramapo Ajax Corporation will be offered for public subscription at par. The American Brake-Shoe & Foundry Co. covenants in the mortgage to retain control of the new company as long as any of the bonds are outstanding. The acquired corporations have been in business since 1883 and manufacture railroad track material, as well as industrial cars and car equipment.

Industrial Finances

Approximately $42,000 will be available for distribution among creditors of the Conradson Machine Tool Co., Green Bay, Wis., whose claims amount to between $150,000 and $175,000. The plant, real estate, machinery, patents, etc., have been sold to Joseph T. Ryerson & Son, Chicago, which has been marketing the bulk of the output of the Conradson company since it was established in Green Bay about four years ago with an investment of about $125,000 in buildings and equipment. The Ryerson bid was $55,000, including the assumption of a $10,000 mortgage. Representatives of the Ryerson company said the plant probably would be resold, as the company is not engaged in manufacturing and it is not likely that any change in policy will be made.

The Security Trust Co. of Detroit has been appointed receiver for the W. J. Baird Machinery Co., 2232 West Fort Street. The creditors have filed a petition alleging bankruptcy, and it is not expected that the company will protest these proceedings.

For the year ending with June, the Canadian Locomotive Co. shows an operating loss of $191,351 after taxes, contrasted with a profit of $827,091 the previous year. After providing for interest, dividends, etc., the company for the past year showed a deficit of $446,299, whereas for the previous year there was a surplus of $340,291.

The terms of the proposed merger of the Atlas Crucible Steel Co. and the Electric Alloy Steel Co. will be submitted this month to the stockholders. The plan as it now stands calls for a new capitalization of approximately $12,000,000 made up in bonds, two classes of preferred stock, as well as no-par common shares.

Between Jan. 1 and Aug. 31, last, the Baldwin Locomotive Works booked $30,389,611 business, or practically double the $15,654,390 taken during the corresponding period last year. In August, business totaled $12,292,342, as against an aggregate of $11,824,687 in the first six months of the year.

The Lima Locomotive Co., Lima, Ohio, on Nov. 1 will call for redemption the outstanding 6 per cent first mortgage sinking fund bonds at the principal amount and a premium of 10 per cent. The original issue was $2,000,000, but the number of outstanding bonds has dwindled to a comparatively small amount.

The Autocar Co., Ardmore, Pa., motor trucks, is offering for public subscription $1,000,000 8 per cent cumulative preferred stock at $102 a share. The stock is callable at $115 a share. Temporary receipts bearing 6 per cent interest per annum until Sept. 15 have been issued to subscribers of the new stock issue.

A public offering was made last week of $1,775,000 Wickwire-Spencer Steel Corporation 7½ per cent ten-year secured convertible notes at 100 and accrued interest.

The Dayton Coal & Iron Co. cases, involving $1,000,000 in claims, have finally been settled after having been in the courts nine years. Non-resident creditors are to get 60 per cent without interest, Tennessee creditors 100 per cent without interest, and the remainder of the assets are to be paid to the Commercial Bank of Scotland and the Bank of Scotland, which are to secure releases of the claims of James Watson & Co. and Dunlop & Co.

The stockholders of the Wickwire-Spencer Steel Corporation have ratified the action of the board of directors in arranging for the acquisition of the entire capital stock of the American Fabrics Co., Chicago. Although under the supervision of the corporation, the acquired company will operate independently. It was also voted to authorize the sale of $1,775,000 principal amount of ten-year 7½ per cent secured convertible gold notes of the Wickwire-Spencer Corporation to finance the purchase.

The Westinghouse Electric & Mfg. Co. has declared the regular quarterly dividends of $1 on both the common and preferred stocks. The common stock dividend is payable Oct. 31, and the preferred Oct. 16, to stockholders of record Sept. 30.

The New York Air Brake Co. has plans under way in which the present capital stock will be retired and new common stock without par value will be issued as well as a series of class A preferred. The new common issue will be in approximate ratio to the present $10,000,000 of outstanding common stock at $100 par value. The success of the plan will raise about $5,000,000 of new capital which will enable the company to retire its bank loan which amounts to about $4,500,000. The remainder will be added to working capital.

The American Locomotive Co., for the six months ended June 30, reports a total deficit of $966,780, as compared with a net profit for the corresponding period in 1921 of $4,556,043, a decrease of $5,522,823. The gross earnings amounted to $7,399,934, against $25,989,781 for the first half of last year. Manufacturing, maintenance and administrative expenses, and depreciation however, was only $8,323,500, as compared with $21,390,554 for the same period in 1921. The gross earnings over the first half of 1922 were the lowest of any six months since the early part of 1915. The strong cash position of the company due to conservation of its net earnings during years of greater earnings, warranted the payment in the six months period of two quarterly dividends, each of 1¾ per cent on its preferred stock, and two quarterly dividends of 1½ per cent on its common stock, a total of dividends paid of $1,625,000 during the half year.

The Carroll Engineering Co., Dayton, Ohio, has been placed in the hands of a receiver, Joseph F. Westendorf being appointed by the court. The company, which manufactures tools and other machine shop equipment, has been operating at a loss for the past six months. It has not been decided whether, in view of improving business conditions, operations will be continued for the time being or the plant closed entirely.

Rogers-Brown Finances

The balance sheet of the Rogers-Brown Iron Co. and subsidiaries, as of Dec. 31, 1921, follows:

Assets: Property account, $18,547,842; Liberty bonds held on behalf of employees, $8,116; deferred charges, $487,856; cash, $542,115; other current assets, $2,720,785; cash in hands of fiscal agents for coupon interest, $106,700; total, $22,413,414.

Liabilities: Common stock, $5,000,000; preferred stock, $1,550,000; first mortgage 5 per cent bonds, $1,483,000; debenture 5 per cent bonds, $980,000; first and refunding mortgage bonds, $3,794,000; notes payable, $3,034,626; other current liabilities, $970,782; bond coupon interest, $106,700; reserves for depreciation, etc., $5,051,414; surplus, $442,891; total, $22,413,414.

The Wickwire Spencer Steel Corporation sales office, 120 Franklin Street, Boston, is to be discontinued. A New England divisional sales office will be maintained at the company's Hammons Street, Worcester, Mass., plant, with Charles K. Hardy, assistant general sales manager, in charge.

Plans of New Companies

The E. J. Longyear Co. of Minnesota has for many years been engaged in mining engineering, contract diamond core drilling, diamond core drill manufacturing, and shaft sinking and mine development work. In order that the various activities of the company might be segregated, separate corporations were recently organized to take over the respective branches of the company's business. The E. J. Longyear Development Co., Inc. (Alabama), handles shaft sinking and mine development; E. J. Longyear Exploration Co. (Delaware) does contract diamond core drilling, and E. J. Longyear Mfg. Co. (Delaware) manufactures diamond core drills. The new manufacturing company, whose general office is in the Security Building, Minneapolis, has taken over in its entirety the plant at Marquette, Mich., formerly operated by E. J. Longyear Co. No expansion of the present activities is under contemplation.

The Baldwin Aircraft Corporation, Baldwin, L. I., has obtained possession of the properties of the Ordnance Engineering Corporation, and has announced that it is in a position to execute orders for aircraft, aircraft parts and for various machine shop, sheet metal and wood work. Its plant is located midway between Mineola and Far Rockaway, which makes it possible to deliver both land and water machines by air. W. F. Bennett, formerly secretary and treasurer of the Lewis & Vought Corporation, is president, and J. J. Rooney is general manager.

The Arras Equipment Co., 68 Cortlandt Street, New York, has been incorporated with a capital of $5,000, to manufacture mechanical and electrical equipment. For the present it will engage in the reconstruction of motors and in general repair work. The incorporators are: T. N. Pfieffer and M. P. Bloch.

The A. E. Thurber Elevator Co., Brooklyn, has been incorporated with a capital of $10,000 to manufacture elevators and parts. It will have its work done under contract. The incorporators are: A. E. Thurber, J. L. Walton and J. J. Hayden. The company is represented by Hastings & Hastings, 258 Broadway, New York.

The Triangle Lamp Mfg. Co., New York, has been incorporated with a capital of $5,000 to manufacture electric lamps. It is conducting a jobbing business and does not intend to manufacture for the present. The incorporators are: E. Max, A. Bernstein and E. Levy. The company is represented by Goodman & Werner, 51 Chambers Street, New York.

The Adelphia Mfg. & Plating Co., Bridesburg, Philadelphia, manufacturer and plater of iron, brass, steel and metal products, has been incorporated with a capital of $20,000, and will continue the business of the Adelphia Plating Co., established in 1917. It is in the market for complete foundry equipment. A brass foundry is being added and the company will specialize in aluminum castings. It is also erecting a new one-story building at Orthodox and Belgrade Streets which will be permanent headquarters. J. F. O'Brien, 4514 Paul Street, is secretary and treasurer.

The F. Wilson Ille Electric Corporation has been incorporated with a capital of $10,000 to manufacture X-ray equipment and electrical apparatus. It will represent the Burdick Cabinet Co., Thompson Plaster X-Ray Co. and the Morse-Chapman Co., handling galvanic and sinusoidal outfits, scales, violet ray outfits, lamps, generators and accessories. This company does not plan to manufacture for the present. Its offices after Sept. 15 will be at 111 East Twenty-third Street, New York. The incorporators are: F. Wilson Ille, J. Ferguson and J. Wolfert.

The Liberty Tool & Die Corporation, 215-217 North Water Street, Rochester, N. Y., general tool and die manufacturer, mentioned in last week's issue of THE IRON AGE under new companies, announces that while it has not undertaken to do a general manufacturing business, it nevertheless has the space and equipment for such an enterprise and is willing to consider propositions of that nature.

The Alemite Grease Cartridge Co., 61 Broadway, New York, has been organized with a capital stock of $600,000 to manufacture metal grease cartridges for automobile lubrication. Operations have already begun with an initial output of 20,000 cartridges per day at the plant in Philadelphia. Provision has been made for gradual expansion. The company is headed by C. E. Roberts and E. C. Landgren. C. M. Russell, 50 Church Street, New York, is the corporate representative.

The Universal Darning Machinery Corporation, New York, has been incorporated with a capital of $500,000 to manufacture textile machinery and parts. Its plans for manufacturing are still pending. The incorporators are: S. Sims and C. M. Fyfe. The company is represented by E. A. McAllister, 2 Rector Street, New York.

The Ohio Auto Parts Mfg. Co. will establish a plant in Lima, Ohio, for the manufacture of castellated nuts. It is now located in Marion, Ohio. O. B. Prime is secretary.

The National Lamp Works of the General Electric Co., Cleveland, has commenced the erection of a $75,000 factory and storage building in Youngstown, Ohio. It will be 97 x 134 ft., three and four stories.

The Multiple Oil Well Tool Co., Detroit, was recently incorporated with a capital of $30,000, to manufacture oil well machinery and tools. Its work for the present will be done under contract.

Trade Changes

Allen Ashley, associated with the domestic sales department of the Westinghouse Electric & Mfg. Co. for 10 years and with the foreign sales department of the Allied Machinery Co. of America for four years, has established a clearing house to handle surplus machinery and supplies at 152 West Forty-second Street, New York.

The Oilgear Co., Milwaukee, has opened a New York office at 39 Cortlandt Street in order to be in direct touch with the entire Eastern territory. Russell, Holbrook & Henderson, 30 Church Street, New York, have been appointed sales representatives for the district in and near New York. Cadillac Machinery Co., Lafayette and Beaubien Streets, Detroit, will handle Oilgear products in Michigan, and R. E. Ellis Engineering Co., 621 Washington Boulevard, Chicago, will represent the Oilgear Co. in Chicago and the surrounding district.

The New Process Gear Division of the Willys Corporation, with plants at Syracuse, N. Y., was bought last week at receivers' sale by Tom Warner, Toledo, Ohio, for $1,904,000. Mr. Warner, who is vice-president of the Durant Motors, Inc., said that he acted individually.

The Detroit office of the Reed-Prentice Co. is now located at 6526 Cass Avenue. T. C. McDonald, formerly of the Indianapolis office, is in charge of the Detroit office, assisted by E. B. Barber, former superintendent of the Lafayette Motor Corporation, Indianapolis.

The Racine Metal Stamping Co., Racine, Wis., has amended its corporate articles to provide for a change in title to Racine Screw Works, to better describe the nature of the principal business in which the concern is now engaged.

The Murdoch Dishwashing Machinery Co., Marion, Ohio, recently incorporated with a capital stock of $250,000, placed its plant in operation a few days ago. H. A. McKinnon is president and general manager.

The Plainville Engineering & Supply Co., Russell building, Plainville, Conn., has purchased the Aldridge Block, which it will occupy as soon as alterations can be made.

The R. F. Carpenter Mfg. Co., Cleveland, metal toilet and office partitions, has discontinued its Boston office. Seeley & Lawson, 73 Tremont Street, Boston, will represent the firm.

The plant of the Victoria Chain Co., York, Pa., has been acquired by the International Chain & Mfg. Co., which will erect new buildings. George G. Campbell, who purchased the stock a year ago, continues as president. J. L. Mueller is vice-president in charge of production. The board constitutes these and R. L. Hunt and A. V. Brown, both of Philadelphia, and H. B. North, York.

The Weller Construction Co., Inc., general contracting and engineering, Equitable Building, Washington, has sold or removed all equipment from Carlisle and is not doing any road work at present.

The Goodman-Krohngold Co., Cleveland; the Goodman Engineering Co., Zanesville, Ohio, and the Electrical Repair & Engineering Co. have consolidated to form the Industrial Electric Co., 5230 St. Clair Avenue, Cleveland. The company will specialize in power equipment.

The White Co., Cleveland, Sept. 1, moved its executive offices from 6611 Euclid Avenue to the plant on East Seventy-ninth Street.

The Mehl Machine Tool & Die Co., Roselle, N. J., makers of jigs, fixtures, dies, gages and special machines, has opened an engineering branch in Cleveland for the purpose of closer engineering co-operation with Middle West customers.

G. H. Patten & Co., 1901 Pine Street, St. Louis, manufacturer of special machinery, has changed the firm name to the Patten Mfg. Co.; also its address to Chattanooga, Tenn.

The Ludlum Steel Co., Watervliet, N. Y., announces the discontinuance of its Pittsburgh office and the consolidation of the business of that office with the Cleveland office. P. R. Thurston, who has been in charge of the Pittsburgh office for the past three years, remains with the company and will continue to handle sales in the territory formerly embraced by the Pittsburgh office, with some additional territory, out of the Cleveland office, 637 Guardian Building, that city.

The Bathurst Co., Ltd., Bathurst, N. B., will build a paper mill in the near future for the manufacture of newsprint. It will adjoin the present buildings and will be of steel and concrete. The initial capacity will be 50 tons per day, to be increased later to 100 tons.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

Bars:	
Refined iron bars, base price	2.94c.
Swedish bars, base price	7.00c.
Soft steel bars, base price	2.94c.
Hoops, base price	4.29c.
Bands, base price	3.74c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	3.04c.
Channels, angles and tees under 3 in. x ¼ in., base	2.94c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	2.94c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.14c.
Toe-calk, ½ x ⅜ in. and larger	4.00c.
Cold-rolled strip, soft and quarter hard	6.75c. to 7.25c.
Open-hearth spring steel	4.50c. to 6.00c.
Shafting and Screw Stock:	
Rounds	3.90c.
Squares, flats and hex	4.40c.
Standard cast steel, base price	15.00c.
Extra cast steel	18.00c.
Special cast steel	23.00c.

Tank Plates—Steel

¼ in. and heavier	3.04c.

Sheets

Blue Annealed

	Per Lb.
No. 10	4.04c. to 4.19c.
No. 12	4.09c. to 4.24c.
No. 14	4.14c. to 4.29c.
No. 16	4.24c. to 4.39c.

Box Annealed—Black

	Soft Steel C. R., One Pass, Per Lb.	Blued Stove Pipe Sheet, Per Lb.
Nos. 18 to 20	4.55c. to 4.70c.	.....
Nos. 22 and 24	4.60c. to 4.75c.	4.60c.
No. 26	4.65c. to 4.80c.	4.65c.
No. 28	4.75c. to 4.90c.	4.75c.
No. 30	5.00c. to 5.15c.	.....

No. 28 and lighter, 36 in. wide, 10c. higher

Galvanized

	Per Lb.
No. 14	4.85c. to 5.00c.
No. 16	5.00c. to 5.15c.
Nos. 18 and 20	5.15c. to 5.30c.
Nos. 22 and 24	5.30c. to 5.45c.
No. 26	5.45c. to 5.60c.
No. 27	5.60c. to 5.75c.
No. 28	5.75c. to 5.90c.
No. 30	6.25c. to 6.40c.

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
½ in. Butt	—53	—38	¾ in. Butt	—23	—5
¾ in. Butt	—58	—45	1½ in. Butt	—25	—7
1-3 in. Butt	—60	—47	2 in. Lap	—19	—3
2½-6 in. Lap	—57	—44	2½-6 in. Lap	—23	—7
7-8 in. Lap	—53	—30	7-12 in. Lap	—15	+1
9-12 in. Lap	—49	—30			

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	3.50c. to 3.75c.
Annealed soft	3.50c. to 3.75c.
Galvanized annealed	4.25c. to 4.50c.
Coppered basic	4.00c. to 4.25c.
Tinned soft Bessemer	5.50c. to 5.75c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	19¼c. to 20¼c.
High brass wire	20¼c. to 20¾c.
Brass rod	16¾c. to 17¾c.
Brass tube, brazed	26¼c. to 27¼c.
Brass tube, seamless	23 c. to 23½c.
Copper tube, seamless	25¾c. to 26 c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 22¾c. to 23¾c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin Grade "AAA" Charcoal 14x20	Bright Tin Grade "A" Charcoal 14x20	Coke—14-20	Primes	Wasters
			80 lb.	$6.05	$5.80
			90 lb.	6.15	5.90
			100 lb.	6.25	6.00
IC	$10.00	$8.50	IC	6.40	6.15
IX	11.50	10.00	IX	7.40	7.15
IXX	13.00	11.25	IXX	8.40	8.15
IXXX	14.25	12.50	IXXX	9.40	9.15
IXXXX	16.00	14.00	IXXXX	10.40	10.15

Terne Plates

8-lb. coating, 14 x 20

100 lb.	$7.00
IC	7.25
IX	7.50
Fire door stock	9.00

Tin

Straits, pig	36c.
Bar	43c. to 47c.

Copper

Lake ingot	15¼c.
Electrolytic	15 c.
Casting	14¾c.

Spelter and Sheet Zinc

Western spelter	8½c.
Sheet zinc, No. 9 base, casks	9¼c. open 9¾c.

Lead and Solder*

American pig lead	6¾c. to 7c.
Bar lead	8c. to 8½c.
Solder, ½ and ½ guaranteed	25c.
No. 1 solder	23½c.
Refined solder	20¼c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	75c.
Commercial grade, per lb	35c.
Grade D, per lb	25c.

Antimony

Asiatic	6½c. to 7c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb. 25c. to 27c.

Old Metals

Prices show little change and the market generally is stronger. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	11.75
Copper, heavy wire	11.25
Copper, light and bottoms	9.25
Brass, heavy	6.25
Brass, light	5.25
Heavy machine composition	8.50
No. 1 yellow brass turnings	6.50
No. 1 red brass or composition turnings	8.00
Lead, heavy	4.50
Lead, tea	3.50
Zinc	3.25

THE IRON AGE

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Control of Raw Material to Suit Output

Woodstock Typewriter Co. Successfully Solves Management Problems—Close Co-ordination of Purchases and Production a Salient Feature

BY GILBERT L. LACHER*

CONTROLLING raw material stocks has an importance now generally recognized. Those manufacturers who did not give this feature of management due attention had it forcibly thrust upon them late in 1920 when inventory values dropped suddenly and large stocks were transformed from assets into liabilities. The prevention of losses resulting from quick changes in market condition, essential as it is, is not, however, the sole reason for keeping down raw material supplies. In certain lines of manufacture, where the finished product is undergoing almost continuous change, owing to the development of improvements in design, excessive stocks prove a handicap to the extent that a new design calls for different materials than were contained in the older product. This consideration is potent in the typewriter field and perhaps explains why so much attention has been given the subject of raw material control by the Woodstock Typewriter Co., Woodstock, Ill. In a similar manner, the regulation of stocks of finished products and the management of the production department itself show the results of a thorough study of the problems attending typewriter manufacture.

This company, employing 500, is not large compared with such mammoth institutions as have grown up in the steel or automotive industries, which consume great quantities of materials. Its product, however, is one consisting of such a multiplicity of different parts as to make proper regulation of raw material stocks more complex than in many larger industries. There are 1400 pieces in the Woodstock typewriter and, allowing for the use of several of the same pieces in a single machine, there are still 600 absolutely different parts. To maintain a minimum supply of materials for these parts, without running the risk of exhausting the stocks and thereby interrupting plant operation, was a problem which called for the creation of a practicable system, founded on accurate records of production in relation to the consumption of materials.

Materials going into a typewriter fall into three main classes: gray iron castings, strip steel and screw

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The illustration at the head of this page depicts the tool room of the plant, with benches located where they get adequate light.

rod. A typical inventory would show in stock about 85,000 lb. of screw stock, 90,000 lb. of strip steel and 18,000 lb. of castings. In the purchasing department a careful record is kept of the amount of each material in store, requisitions by the plant and purchases of additional material. This applies not only to the three main classes mentioned, but also to every other material that goes into the typewriter, including purchased finished parts, such as key rings, and semi-finished parts, such as wood cores for platens, and likewise to manufacturing supplies used in the factory, purchased small tools and to office supplies, such as stationery, etc. The records are kept on what are termed "raw stock cards," on which are indicated the minimum amounts of the materials used which should be kept in stock. In other words, the purchasing agent makes it his business to place additional orders before the stock on hand falls below the safety line.

Control of Raw Materials

It is to be noted that on the separate raw stock card kept for each size of material is recorded the typewriter part which is made from that material. If several parts are made from the same size material, as is sometimes true, especially in the case of screw rod, all such parts are entered on the card. The amount of steel required to make each part for 1000 machines is also recorded.

At the top of the card is entered the total amount of that particular size of steel required for 10,000 typewriters, for the part or parts for which it is used. This figure is recorded on the card as a "minimum," although it does not actually represent the minimum amount of material which the company proposes to carry, but is analogous to a list price on a commodity. To obtain the actual minimum, this figure must be multiplied by a certain percentage which will vary according to three factors: (1) rate of production by the factory in typewriters per day; (2) time required for obtaining this material from the steel mills; (3) the possibility of governing inventories so carefully that orders may be lumped to secure a carload instead of a less-than-carload freight rate, thereby effecting a saving.

Information for the rate of production must be estimated and is based on the sales department's survey of prospective business. The time which must be allowed for delivery of materials depends largely on market conditions: in dull periods mill shipments are sometimes obtained in two weeks, whereas at other times deliveries may take ten or twelve weeks. Together with the matter of mill deliveries is considered the trend of steel prices. In a rising market it is advantageous to buy heavily, while in a declining market the incentive is to hold back purchases as much as possible. Speculation as to the course of prices, however, must never permit stocks to drop down to a day's or even a week's supply, thereby incurring the danger of stopping factory operations for lack of material.

Necessity for keeping stocks above the danger point is also a prime consideration when lumping orders to get the benefit of the carload rate. In connection with screw rod, which is used in a great variety of sizes, ranging from 1/16 in. in diameter to 1½ in., it has been found that the larger sizes are easier to get from the mill than the smaller ones. The sizes used by the plant, therefore, have been divided accordingly into two main groups. In the case of the smaller sizes, much more time is allowed for the receipt of new shipments than for the other class. In the case of strip steel the same group principle has been applied, except that, owing to the nature of typewriter construction, the sizes form three groups, one of which is easier to get than the other two.

The raw stock card shown in Fig. 1 is typical of those kept by the company. The number of entries, however, has been limited so that the purport of the card can be easily grasped by the reader. This card contains the record for round ½-in. screw rod, from which four different parts and eight separate pieces are made for each Woodstock typewriter. After each part number are recorded the number of parts used in each typewriter and the weight in pounds of screw rod for 1000 parts. To secure the weight of screw rod required for 1000 typewriters, the weight per part is multiplied by the number of parts per machine. Thus, the weight of steel used to make 1000 pieces of part No. R-317 is 24.6 lb. As two of these parts are used in each typewriter, 24.6 lb. is doubled to secure the weight per 1000 machines, or 49.2 lb. In this manner the weight of all the parts made from ½-in. screw stock is computed and the total weight per 1000 machines is finally multiplied by 10 to secure the "minimum" amount, or that required for 10,000 machines.

It will be noted from the card that, on Dec. 27, stock ordered out of store by the factory, 1067 lb., reduced the balance in the stock room to 1336 lb., or considerably below the "minimum" of 2249 lb. This was a signal to the purchasing agent to place an order for additional material, which he did, 2000 lb. being ordered on Jan. 13. On Feb. 13 the material arrived, being 2065 lb. in weight, or 65 lb. in excess of the order. The receipt of this amount thereby increased the balance then remaining in store to 2612 lb.

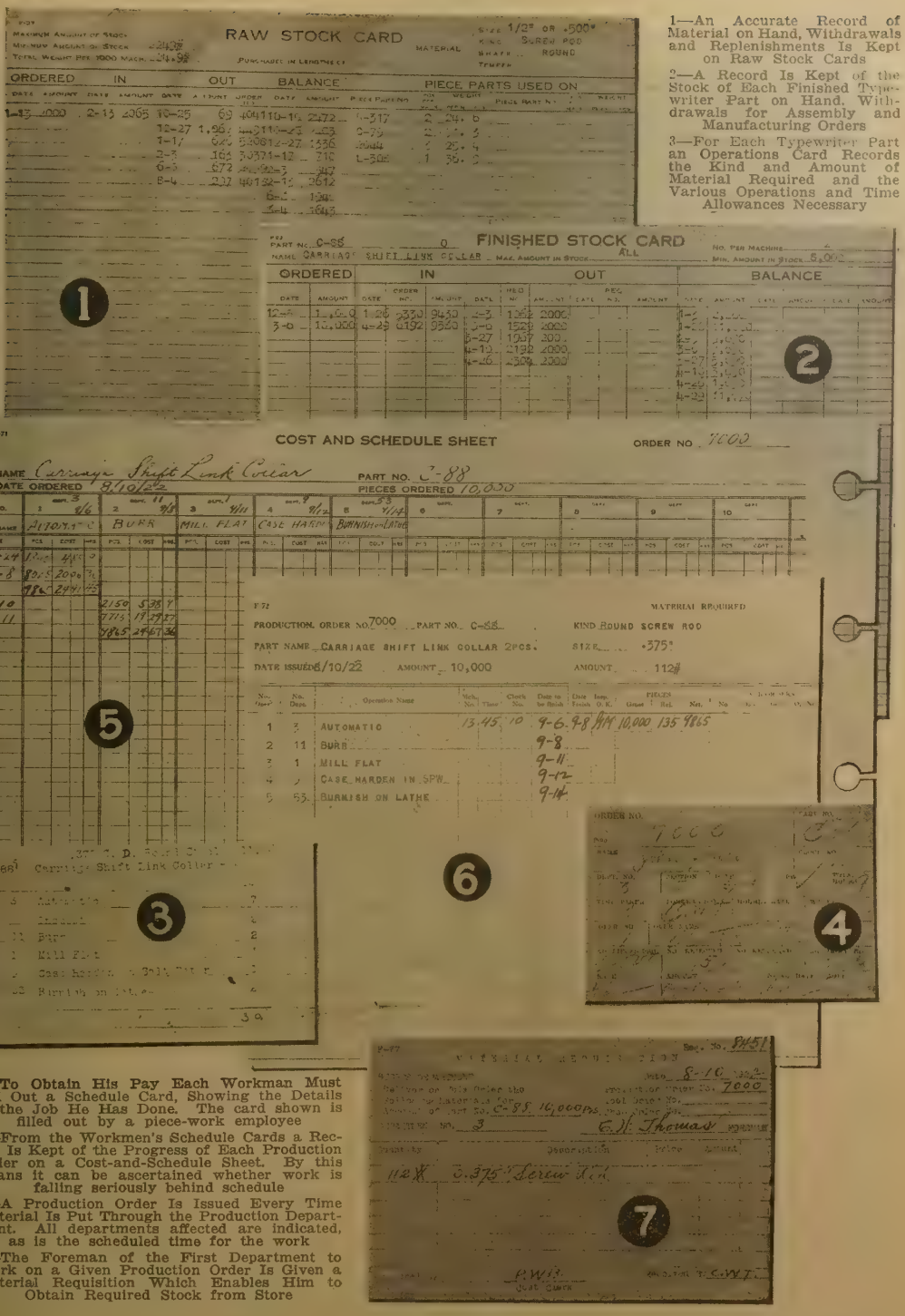
Withdrawals of material from store are easily checked with stock room records by means of production orders, which must be made out whenever any typewriter part is made. On each order is indicated the name and size of the material used and the amount required to make a specified number of parts.

How Finished Material Is Controlled

The care used in controlling raw material supply is no greater than that exercised in regulating finished material stocks. For each finished part also a "minimum" is established which serves a purpose similar to that of the minima for the various sizes of raw material. With the latter, the function of the minimum is to enable the purchasing agent to determine when new orders should be placed to replenish store room stocks; in the case of finished parts the minimum indicates when the factory should be ordered to make more pieces. Like the minimum for raw material, that for finished parts is a list figure. The minimum recorded on the finished stock card shown in Fig. 2 is 8000 pieces. The factors affecting this figure are the number of typewriters assembled in the plant per day and the time required to make a new lot of the part. In this case it is estimated that 8000 pieces form a safe balance to have in stock for a production of 100 typewriters per day. As two of these parts go into each typewriter, this means a stock sufficient for 4000 machines, or 40 working days.

By referring to the card it will be noted that on Jan. 3 the balance of parts in stock had dropped to 2260. That the need for additional parts had been anticipated is indicated by the fact that on Dec. 8 an order for 10,000 pieces had been given to the factory. On Jan. 26 this order had been completed and 9430 pieces were added to the balance, bringing the total up to 11,690 in stock. Requisitions from stock by the assembling department on Feb. 3, March 6, March 27, April 10 and April 26 again reduced the balance to 1690. On April 29, however, another order, placed March 6, was completed by the factory and the balance in stock was swelled to 11,070.

As a check on the balance shown on the card, a perpetual inventory is kept in the store room. Ordinarily the difference, if any, between the computed balance and the inventory is small and is ascribable to the handling of the pieces on scales which weigh in terms of pieces, thus eliminating the necessity for



1—An Accurate Record of Material on Hand, Withdrawals and Replenishments Is Kept on Raw Stock Cards

2—A Record Is Kept of the Stock of Each Finished Typewriter Part on Hand. Withdrawals for Assembly and Manufacturing Orders

3—For Each Typewriter Part an Operations Card Records the Kind and Amount of Material Required and the Various Operations and Time Allowances Necessary

4—To Obtain His Pay Each Workman Must Fill Out a Schedule Card, Showing the Details of the Job He Has Done. The card shown is filled out by a piece-work employee

5—From the Workmen's Schedule Cards a Record Is Kept of the Progress of Each Production Order on a Cost-and-Schedule Sheet. By this means it can be ascertained whether work is falling seriously behind schedule

6—A Production Order Is Issued Every Time Material Is Put Through the Production Department. All departments affected are indicated, as is the scheduled time for the work

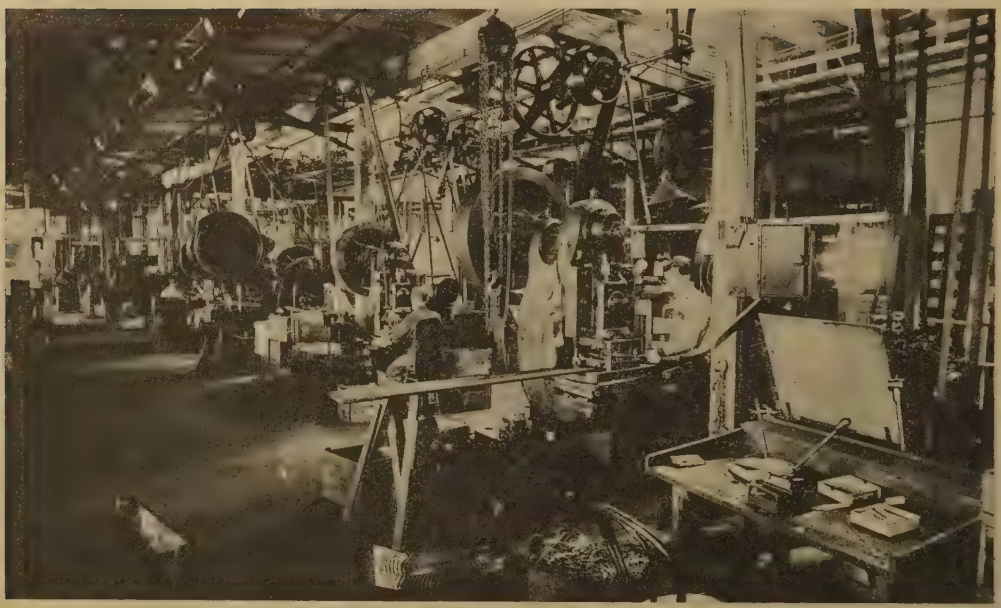
7—The Foreman of the First Department to Work on a Given Production Order Is Given a Material Requisition Which Enables Him to Obtain Required Stock from Store

Seven Forms or Cards Used in Controlling Raw and Finished Materials and Their Movement Through the Processes of Manufacture

counting. If a wide discrepancy develops, however, a second check is made of the parts in store.

Ordering of parts from the factory is handled by means of production orders, given to the manufacturing department whenever it appears from the finished stock card that a new supply of parts is needed. All orders must be placed far enough in advance to permit plenty of time for their execution. The proper time allowance is not a matter of guess, but has been worked out carefully from a study of individual operations. For each typewriter part, in fact, an operations card has been prepared. The card shown in Fig. 3 is for part No. C-88, a carriage shift link collar, of which there are two for each machine.

This part is made from ⅜-in. cold drawn round steel, of which 1000 typewriters require 11.2 lb., as indicated on the card. The figures at the extreme left of the card indicate the number of each operation in order, there being five operations in this instance. Next to the right are the numbers of the respective



Punch Press Department; This and the Screw Machine Section of the Plant Are the Two Primary Departments for the Production of Small Parts

departments in which these operations are to be performed. In the middle of the card a brief description of each step in the manufacture is indicated. Thus "automatic" means that the part is to be formed in the automatic screw machines. "Inspect," when used, indicates that an inspection must be made after the parts leave the screw machines. "Burr" means that any burrs remaining on the parts are to be removed in a drilling machine. "Mill flat" calls for the milling of the surface of the part, and "case harden in salt peter" and "burnish on lathe" require no explanation. The figure 12 at the top of the column on the right of the card signifies that an allowance of 12 days is permitted before the starting of the operations. This tolerance is to allow each foreman to arrange all the work within his department. Perhaps some of the cams required on a job just received may be in use on another job then running, or for other reasons the work can not be started immediately.

Under the figure 12 are indicated the number of working days set aside for each operation. Thus, 7 days are allowed for screw machine operations. The total number of days permitted for the completion of the parts, including the 12 days initial allowance, is 30. To this total is always added an additional flat allowance of 10 days, the theory being that new stock should arrive in the store room 10 days before the bins are empty. The significance of the figure 40 is appreciated by computing the number of parts required in 100 typewriters per day—assuming that this be the production of the plant. As two parts go into each machine, 200 parts are required daily, or 8000 in 40 days. This means that when only 8000 pieces are in stock, a new production order should be issued to insure replenishment of the supply by the time the existing stock is used up, i.e., in 40 days.

Checking Progress of Work

Of course, the mere placing of production orders does not insure their execution on time. It is evident that the management cannot sit back supinely and let matters take their course. Delays may result from numerous causes, such as the breakdown of a machine, the illness of an operator, etc. A means of checking the progress of the work is essential, and such a means has been supplied.

To obtain his pay each workman must fill out a schedule card, Fig. 4, showing his name, the number of the part he has worked on, of the production order, of the department, of the department section, the name of the operation, the number of hours worked and of pieces produced, the number rejected, returned and accepted, the rate of pay and the total day's wages. From these cards the cost department keeps a record of the progress of the work, on a cost-and-schedule sheet, Fig. 5. By comparing the time of completion of a given operation with the scheduled completion (as given on the operations card) which is indicated at the top of the sheet, it can be ascertained whether the work is falling behind.

Frequently a delay in one department is so slight that it suffices to speed up the work in a subsequent department. Sometimes, however, it is necessary to rush through an emergency order, known as a "sub order," calling for the completion of only a portion of the original order. At other times it may prove desirable to start an entirely new production order, as the delays to the first order might result in the requisition of all of the parts as soon as they reached the stock room, thereby again putting the factory behind the assembly department.

A cost-and-schedule sheet is made out for each production order. On both are indicated the number of the production order and of the part, the date of issuing the order, the number of pieces ordered and of operations in order, the department numbers, the name of each operation and the scheduled time for its completion. In addition, the production order shows the kind and amount of material required. Thus, in Fig. 6 it is indicated that 112 lb. of ⅝-in. round screw rod is required to make 10,000 pieces of part No. C-88. The production order also provides columns for the insertion of the number of the machine on which the work is done, the time taken for each operation, the number of the time clock, the date when each operation is actually finished, the O.K. of the inspector, the gross number of pieces produced, the rejections and the number accepted. Columns have also been provided to keep a record of sub-orders.

With each production order is issued a material

(*Continued on page* 761)

Scarcity of Common Labor in Industry

Immigration Law Operates to Hamper Manufacturing and Skilled Workmen May Yet Suffer from Present Policy

BY ACHESON SMITH*

IN view of the intimation that employers will seek the repeal of the present immigration law in order that they may procure low priced labor, it will be of interest to outline the situation as it confronts manufacturers and other employers in the United States. Those who have discussed immigration usually have done so with the necessity for severe restrictions in mind, either as to numbers or quality or both. The matter will be considered, therefore, from the standpoint of our actual need of men to do our laboring work, for such is obviously the case.

While it is, of course, true that every employer finds it necessary to procure his labor as cheaply as possible, it is not true that employers are anxious for more alien labor simply because it is cheap. The cost of labor is dependent both upon the wage paid and upon the amount of work done, and it has been our experience in this country that labor working for low rates is not always the cheapest. At present the output of many manufacturers is limited by the shortage of men, and employers are therefore desirous of having the number of immigrants increased because they need help, and they are perfectly willing to pay the prevailing wage rates.

The use of the word labor is likely to be rather ambiguous, as it is frequently used to cover the skilled trades and sometimes used to include all wage earners. In what follows the term labor is meant to include what is ordinarily known as common labor and does not include skilled workers.

Actual Loss in Day Laborers

There is at present a very definite scarcity of labor and there is evidence that many localities are seriously affected. Undoubtedly one of the principal contributing causes to the present shortage is our immigration law. In the eleven months of the Government year, ending with May 31, 1922, we gained by immigration 98,605 persons. In other words, about 98,000 more people came into the country than left it during that period. An analysis of the figures by races, however, shows that we actually lost in the nationalities that do our labor calling for muscular strength, while we gained largely in those people who come in to trade and follow other employment than labor. The adjoining tabulation, issued by the Bureau of Immigration, shows the immigrants and emigrants during eleven months of the Government year.

An inspection of the above figures indicates that we actually lost over 33,000 who labor and gained very largely in those who will probably not do the work of common labor. Too much cannot be said about the desirability of English, French and Scotch immigrants, for they certainly raise the standard of our foreign born population and are highly desirable. Looked at from the standpoint of the need for laboring men, they do not, however, help our present situation. We could get along without the 48,000 Hebrews whom we gained during the eleven months; but we are absolutely dependent upon alien labor to use the shovel and other simple implements of industry.

Dependence Upon Alien Labor

In the highly developed industrial sections of the United States practically no native born American will do laboring work, and the children of our foreign born, if they go to our public schools, will not do the work of a common laborer. The tendency to rise socially and the natural tendency to avoid laborious tasks both make men shun such work. The result is that within our country we are not producing laboring men, and we are actually by our social and educational systems drawing men rapidly away from work of that class. Our experience for a great many years has shown that we are entirely dependent upon alien labor to do most of the manual laboring work, and unless an adequate supply is admitted the development of the country inevitably will be retarded.

Race or People	July 1, 1921, to May 31, 1922	
	Immigrants	Emigrants
African (black)	4,631	1,905
Armenian	2,238	231
Bohemian and Moravian (Czech)	3,049	4,128
Bulgarian, Serbian and Montenegrin	1,358	5,559
Chinese	3,866	5,855
Croatian and Slovenian	3,755	3,914
Cuban	640	792
Dalmatian, Bosnian and Herzegovinian	284	510
Dutch and Flemish	3,503	1,981
East Indian	214	216
English	27,195	8,407
Finnish	2,301	1,117
French	12,467	3,099
German	28,462	5,311
Greek	3,794	7,117
Hebrew	49,388	763
Irish	15,127	2,104
Italian (North)	6,033	6,849
Italian (South)	31,843	43,475
Japanese	5,264	4,005
Korean	62	43
Lithuanian	1,425	4,395
Magyar	5,993	4,579
Mexican	14,223	5,541
Pacific Islander	7	3
Polish	6,209	29,986
Portuguese	1,775	5,830
Rumanian	1,501	4,094
Russian	2,237	2,667
Ruthenian (Russniak)	673	436
Scandinavian (Norwegians, Danes and Swedes)	15,570	3,868
Scotch	13,973	1,519
Slovak	5,947	3,203
Spanish	1,701	7,456
Spanish-American	1,257	1,603
Syrian	1,308	1,344
Turkish	38	250
Welsh	872	136
West Indian (other than Cuban)	885	769
Other peoples	712	1,115
	284,780	186,175

It has been said that organized labor is largely responsible for the present immigration law—at least the unions strongly favored the passage of the act. They, of course, thought by curtailing the supply of labor to strengthen the union cause and help to keep up wages, and while the temporary effect will be in that direction they are bound to suffer in the long run. The work done by common laborers is fundamental and absolutely necessary. We have no means at present of avoiding the pick and shovel work which laborers are required to do.

Many labor saving devices have been brought out, and undoubtedly much more will be done in that direc-

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tion, but they can go only so far toward relieving the situation. It is safe to assume that there will always be a large amount of work that will have to be performed by men willing to exercise their muscles and in a very literal sense earn their bread by the sweat of their brows. Houses cannot be built if there are no men to make the excavations for the foundations. Bricklayers cannot work if there are no laborers to carry up the bricks. In fact, skilled labor of all kinds will soon find its employment restricted if there is a serious lack of laborers to do their part of the work. It is, therefore, to the interest of skilled labor, to the interest of the manufacturer and to the best interests of the country to admit more laboring men.

Organized Labor May Be a Loser

If it is true that organized labor wishes to restrict immigration in order to help the union cause, it is laboring under a great delusion, for the very success of the unions in increasing their wages has been due to the fact that they can benefit themselves at the expense of the rest of the people in the country. If by limiting immigration the wages of common laborers are forced to a high level, organized labor will inevitably have to accept lower wages—at least their wages will be lower comparatively. In other words, as it is impossible to increase the income of every one in the country except by greater production, it is obvious that if common laborers are largely increased in their wage others will have to take somewhat less. This is simply an economic truth that neither labor unions nor legislation can change.

It might interest some people to remember that immigrants become consumers as well as producers, and are therefore of distinct value to the country from both standpoints. When an immigrant is domiciled in his native land he is not a potential customer of the United States; that is, he probably will not buy anything from us. On the other hand, when he comes into our country he not only becomes a worker and a very important aid to the wealth producing agencies of the nation, but he also at once becomes a consumer to practically the extent of his income. Everything that he buys he purchases in this country, and our foreign born residents provide one of the largest single markets we have for our cotton, wool and foodstuffs.

There are important social reasons for limiting immigration and we should enforce strict regulations regarding physical health and mental capacity. It is well to insist upon a blood test and an intelligence test, such as has been proposed, for the purpose of raising the mental standard of those coming into the country. It is desirable to have such selection made in the country of origin and not permit the immigrant to start for the United States until he has received a certification regarding the necessary qualifications. We must insist upon freedom from disease and on mental capacity sufficient for intelligent citizenship. This is particularly true when we contemplate the second generation, for the descendants of foreign born parents have become a large percentage of our population and are wielding a very large influence in our social and political affairs.

The Question of Citizenship

It has been suggested that we admit only those who declare their intention of becoming citizens; but this would seem to be a very unimportant and perhaps useless provision. In the first place, the immigrant probably will not know what he intends to do when he leaves his native land, but will declare his intention to become a citizen solely for the purpose of being admitted to the United States. In the second place, if he finds congenial work here and becomes anchored in some locality he will very probably desire to become a citizen, anyway, and take the necessary steps. In the third place, the heavy flow of alien labor out of the United States and to the various European countries in times of business depression in the United States is a feature that has distinct advantages to our country, and as the alien has probably rendered full value for the wages received we should not object to his return to his native land.

If, as has been said, the children of foreign born tend away from common labor, we have a system of evolution which would seem to be very desirable, both from the standpoint of the immigrant and from the standpoint of the country. The class of immigrants who come here to labor have little or no education but they are capable of doing very useful work. After they have been in the United States for some years they begin to get into the semi-skilled jobs, and their children, after passing through our public schools, find themselves fitted by education and by inclination for work that is somewhat higher in the social scale than common labor. As the first generation passes away we are dependent upon new arrivals for the distinctly laboring work, and such new arrivals will in a generation become Americanized both politically and socially. We thus have an upward movement which, as has been said, seems to be very desirable both from the standpoint of the immigrant and a healthy trend among that class of our population.

Defects in Present Law

Our immigration law at present has three serious defects:

1. By the quota system it cuts down the number of entries into the United States to 3 per cent of the number of foreign born persons of such nationalities resident in the United States, as shown by the Census of 1910.
2. Apparently no allowance is made for those who go out of the country. For example, there might be an emigration of 5 per cent, whereas we restrict the immigration to 3 per cent, which would of course mean a net loss instead of the gain for which the law apparently provides.
3. A literacy test is required which, from the standpoint of the good of the country, is a farce. The immigrant is required to be able to read and understand at least one language, which means that many able-bodied men who wish to do some honest work are excluded, while every educated radical who does not wish to work may enter the country.

It would seem possible to work out a figure indicating the number of additional laborers annually needed to take care of the increasing demand; that is, the growth of the country plus the laborers who forsake laboring work. Immigration to at least that extent should be provided for and it should be a net figure. In other words, the number that is admitted should take into account those leaving the country so as to be sure that we have a certain net gain in men each year. The literacy test should be abolished, as it is of no value whatever and prevents many an industrious peasant from entering our country at a time when he is badly needed. Authority should be placed in the hands of the President, or power given a commission, to increase or decrease immigration in accordance with the needs of the country.

Due to the increased industrial activity we now have a shortage of laboring men, and if we are actually losing that grade of labor by emigration we are going to be in a serious situation. Steps should be taken to correct this condition as far as this can be done by legislation. Not only is the country working back to a normal state of activity, but we must remember that the country is growing steadily from year to year, which of course means that more and more common laborers will be needed, and if they are not admitted as immigrants it is not apparent at present whence they will come.

[By continents, the figures in the table on the preceding page show the following:

	Immigrants	Emigrants
Africa	4,631	1,905
Asia	12,990	11,944
Southern Europe	70,033	96,714
Northern Europe	130,014	65,026
Latin America	17,005	8,705
Miscellaneous	50,107	1,881

EDITOR.]

DROP FORGING INSTITUTE

Scheme of Operations of American Association Which Is to Meet in Detroit

In writing about the annual convention of the American Drop Forging Institute, to be held in Detroit on Oct. 3 to 6, concurrently with the convention of the American Society for Steel Treating, Scovell, Wellington & Co., commissioners of the association, have supplied some information of the objects and workings of the organization.

The institute was formed in 1920. The executive membership from the beginning has concerned itself with problems affecting the production of drop forgings for sale, including a study of raw material and supply markets, industrial relations, production and accounting methods, supply and demand for drop forgings, and the extension of the market therefor. Information, collected and distributed at regular intervals, covers: The total volume of purchases of the important classes of material, with current market prices. The rates of wages and earnings, hours of labor, and number of men employed, by classes. The total hammer-hours operated, as compared with the capacity of the membership, in each of several classes of equipment. The total tonnage of steel consumed, and the total volume of shipments made. The total volume of new business booked and of unfilled business on the books of the membership. As the product of the institute is almost exclusively contract forgings (the institute does not concern itself with finished product such as tools, wrenches, etc.) there are no average prices available, and the institute does not deal in any manner with the question of market prices of its product.

It was soon apparent that, in the consideration of many of these problems, the experience and knowledge of drop forgers whose product does not reach the market, but is absorbed either by themselves or by closely affiliated interests, would be valuable. In order to enlist their support, a manufacturing committee was appointed, with a director of the institute as general chairman, the members of which are chairmen of various regional groups. At present there are four such groups, as follows:

Atlantic, including New England, eastern New York and Pennsylvania, and the Atlantic Coast States. Chairman, J. B. Sehl, second vice-president Billings & Spencer Co., Hartford.

Central, including western New York and Pennsylvania, and Ohio. Chairman, E. E. Adams, general superintendent Cleveland Hardware Co., Cleveland.

Indiana-Michigan, including also Ontario. Chairman, R. T. Herdegen, vice-president and general manager Dominion Forge & Stamping Co., Ltd., Walkerville, Ont.

Western, including all territory west of the Indiana-Michigan boundaries. Chairman, F. A. Ingalls, vice-president Ingalls-Shepard Division, Wyman-Gordon Co., Harvey, Ill.

Ferdinand Barnickol, president Indianapolis Drop Forging Co., Indianapolis, is general chairman of the manufacturing committee, and A. D. Armitage, vice-president and general manager J. H. Williams & Co., Buffalo, is member-at-large.

These groups hold quarterly meetings, primarily to consider problems of production, engineering, shop accounting, and industrial relations, which are available to any drop forger interested in such problems, either through executive membership in the institute, if eligible, or as an associate member, if the character of his business is such as to make him ineligible for executive membership. The manufacturing committee is also in charge of the annual convention of the institute.

As the activities of the manufacturing committee would duplicate in large measure the work of the American Drop Forge Association, overtures were made to that organization looking toward amalgamation of the two bodies, and this was finally accomplished on Jan. 1, 1922, all members of the association being carried as associate members of the Institute until July 1, at which time they were given opportunity for continuing either as executive or associate members, depending upon their eligibility.

Among the first actions of the institute was the appointment of a cost committee to study cost accounting methods. A report on a survey of the industry, with recommendations for uniform methods, previously prepared for some of the larger members by Scovell, Wellington & Co., was made available to all members. Data on the present methods of cost accounting and estimating employed by the members have been collected periodically; and the committee, composed of J. B. Sehl, chairman; C. C. Winn, assistant treasurer; Wyman-Gordon Co., Worcester, Mass., and F. S. Hatch, assistant treasurer Moore Drop Forging Co., Springfield, Mass., is now issuing a series of articles to all members, both executive and associate, comprising a treatise on the "Essential of Drop Forging Accounting."

Besides the manufacturing division, in charge of the group meetings and of the annual convention, a purchasing agents' division was established early in the institute's history; and the organization of an accounting division, to further the work of the cost committee, is now contemplated. Other standing and special committees look after specific items in the institute's program.

The direction of the institute's policies is in the hands of a board of directors of nine members, three of whom are chosen each year for a three-year term. From among their number a president and two vice-presidents are chosen annually. Neither directors nor officers can serve for more than one term consecutively, except that ex-presidents are ex-officio advisory members of the board of directors. The present officers of the institute are:

President, J. H. Williams, president J. H. Williams & Co., Brooklyn, N. Y.

Vice-presidents, H. G. Stoddard, vice-president and treasurer Wyman-Gordon Co., Worcester, O. F. Transue, president and general manager Transue & Williams Steel Forging Corporation, Alliance, Ohio.

Directors, C. E. Adams, president Cleveland Hardware Co., Cleveland; F. C. Billings, president Billings & Spencer Co., Hartford; C. A. Brauchler, president and general manager Canton Drop Forging & Mfg. Co., Canton, Ohio; Ferdinand Barnickol, president, Indianapolis Drop Forging Co., Indianapolis; A. H. Chapin, president Moore Drop Forging Co., Springfield, Mass.; J. F. Connelly, vice-president Champion Machine & Forging Co., Cleveland.

Ex-president, F. A. Ingalls, vice-president Ingalls-Shepard Division, Wyman-Gordon Co., Harvey, Ill.

The affairs of the institute are administered by its commissioners from their office at 1168 Hanna Building, Cleveland.

Nagle Steel Plants to Resume Sept. 20

George H. Heck and associates, 518 Commercial Trust Building, Philadelphia, who, as announced in last week's issue, have purchased the Pottstown and Seyfert plants of the Nagle Steel Co., state that these plants will resume operations in the manufacture of sheets under the new management on Sept. 20. Details as to organization of the new company will be announced shortly. The Pottstown and Seyfert plants will be continued under the name of the Nagle Steel Co.

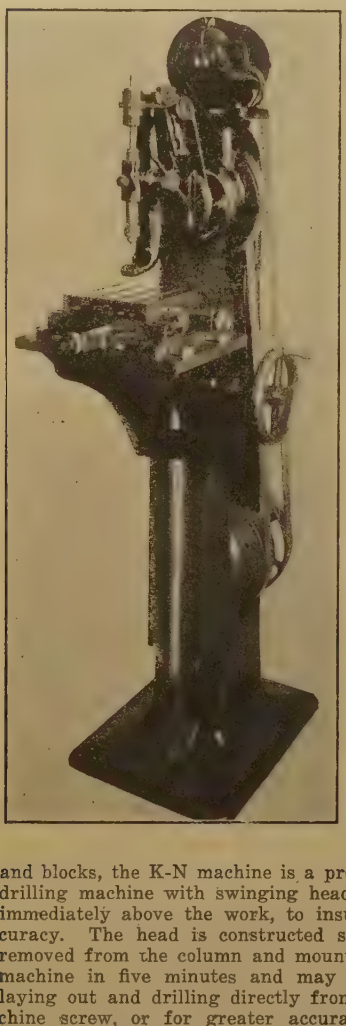
Minnesota Steel Company's First Steel

The recently completed wire rod mill of the Minnesota Steel Co., Duluth, Minn., rolled its first steel on Sept. 11. The mill will furnish rods to the new wire plant of the same company which, up to the present time, has been receiving rods from the Joliet mill of the American Steel & Wire Co.

Bone coal, formerly considered a waste, is to be used as a boiler fuel by the United States Coal & Coke Co., Gary, W. Va. The fuel will be utilized in pulverized form, and a pulverizing, distributing and burning system is being installed by the Fuller-Lehigh Co. Each 800-hp. boiler is to be equipped with five vertical burners, taking the fuel from five 3-in. screw feeders.

Laying Out and Drilling Machine

A new tool room machine, which in conjunction with the Johansson compound slide and blocks is calculated to make a complete, independent laying out and drilling machine for the spacing of holes in dies, jigs, templates, master-plates, etc., and to do it with Johansson accuracy in less time than it takes to do the work in any other way—in one-tenth of the time it takes using buttons, it is stated, is being manufactured by Franz K. Krag, Chicago.



The head of the K-N machine swings a full 360 deg., allowing drilling to be done at any point in the circle. It has an interchangeable bushing supported in a rigid arm, integral with the machine, immediately above the work, to prevent any spring of the drill. The machine has six changes of speed, from 400 r.p.m. to 4300 r.p.m., furnishing the proper speeds for drills up to ¼ in. in diameter.

Without the use of the Johansson compound slide and blocks, the K-N machine is a precision, high-speed drilling machine with swinging head and drill guided immediately above the work, to insure speed and accuracy. The head is constructed so that it may be removed from the column and mounted on the milling machine in five minutes and may then be used for laying out and drilling directly from the milling machine screw, or for greater accuracy, in connection with the Johansson compound slide and blocks.

As a routing and milling machine, it works with a single lip cutter, which can be made up quickly for any shape desired. A locking screw is provided for locking the spindle in a fixed position. The spring idler keeps the belt at the proper tension, allowing the belt to slip, if too great pressure is exerted on the cutter, and thereby saving the cutter from breaking. The speed, which is seven times the milling machine speed, makes it possible to use a very small cutter.

E. L. Krag & Co., 50 West Randolph Street, Chicago, Ill., are the distributers for the K-N machines and attachments.

Inventories of the estate of Ferdinand Schlesinger filed in the probate court at Milwaukee show a valuation of $2,062,709.55, exclusive of gifts aggregating $6,374,678.34 made to members of his family over a period of six years prior to his death. The bulk of stocks consists of 60,711 shares of common stock of the Steel & Tube Co. of America, appraised at $667,821, and shares in the Newport Mining Co., Detroit Iron & Steel Co., and Harrow Spring Co., Kalamazoo, Mich.

Ball Bearing Notable for Its Size

The Standard Machinery Co. Auburn, R. I., has completed a ball bearing which, it is believed, is the largest of its kind ever produced. It is worthy of note also because of the success attendant upon its manufacture and its recent duty in service as well.

The bearing is of the conventional design and consists of an upper raceway, a lower raceway, and 40 balls. The raceways are alike, being 56.25 in. plus 0.003 in. outside diameter, with inside diameter of 46 in. minus 0.003 in. and a thickness overall of 2.75 plus or minus 0.01 in. The balls are 4 in. in diameter and lapped to a tolerance of plus 0.003 in., minus zero. The raceways and balls are of chrome bearing steel hardened and ground, both showing a scleroscope hardness reading of 92 to 96.

The races are capable of carrying a sustained load of 100,000 lb. on one ball applied at any point in the circumference of the groove and each ball will stand a load of 100,000 lb. when placed between the finished races without showing any permanent deformation or surface cracks.

The balls were tested by the manufacturer under a Riehle testing machine using the three-ball method, wherein three balls are superimposed, the center ball being the one actually under test. The three-ball method has proved itself to be the most reliable for testing, and is replacing the old way of testing one ball between two hardened steel plates, this three-ball method being regarded as more severe, due to the fact that the ball under test is only supported by an actual point of contact, with the results likely to be accurate, consistent and reliable.

The formula used by the Standard Machinery Co. for crushing strength of steel balls under the three-ball method is 100 x D^2 where D represents the diameter of the ball in one-eighth inches. This would mean that the 4-in. balls would crush at a load of about

1,024,000 lb., while the design requires only a strength of 100,000 lb., so that an ample factor of safety was thus obtained. From the above analysis of this ball thrust bearing, it would thus be possible to subject it to a perfectly safe load of 4,000,000 lb., providing the stresses were equally divided on all the balls, and it would collapse under a load of 40,960,000 lb. under a uniformly distributed stress. The static load on this thrust bearing in service is about 550,000 lb.

At the top of page 589, in our issue of Sept. 7, it is stated that the new pig casting machine of the Emporium Iron Co., Emporium, Pa., was furnished by the Pittsburgh Coal Washer Co. We are now informed that this is an error; the machine was furnished by Heyl & Patterson, Inc., Pittsburgh.

Iron and Steel Electrical Engineers Meet

Cleveland Convention Was Notably Successful—Power Problems, Combustion and Electrification Discussed—Efficiency of Electric Power Supply

BOTH from the standpoint of attendance and interest taken in the technical sessions, and in the size and attractiveness of the exhibits, the sixteenth annual convention of the Association of Iron and Steel Electrical Engineers, held in the Public Hall, Cleveland, Sept. 11 to 14, was declared the most successful ever conducted by the association. Registration amounted to about 2300, including both members and visitors. The meeting place proved particularly well suited for the convention as the large exhibit room of the hall provided ample space for display and permitted the 85 exhibitors to make a more complete showing of their products than they could have done with a more limited space. The exhibits included electrical apparatus, handling equipment and other appliances used in steel plant operations.

Technical sessions, held in adjoining rooms on the same floor, were scheduled to continue until Friday noon, but a change was made in the program and the last session took place Thursday afternoon. These technical sections proved of much interest and several of the papers brought out considerable discussion. One entire day was devoted to the subject of fuel economies.

At the annual banquet, held at the Statler Hotel Thursday evening, several interesting speakers were on the program. These included Charles P. Steinmetz, chief consulting engineer General Electric Co.; the retiring president, W. S. Hill, electrical engineer Illinois Steel Co., South Chicago; J. S. Unger, manager of the research department Carnegie Steel Co., and C. L. Collens, president Reliance Mfg. Co., Cleveland. H. P. Bope, formerly general sales manager of the Carnegie Steel Co., was toastmaster. The Cleveland section entertained the visitors Tuesday evening with a dance and organ recital at the Public Hall. An interesting lecture on the science of numbers was given by E. Kieft, engineer of tests at the Gary plant of the Illinois Steel Co.

At the business meeting Monday forenoon R. B. Gerhardt, electrical engineer Bethlehem Steel Co., Sparrows Point, Md., was elected president for the ensuing year. Other officers elected were as follows: First vice-president, L. F. Galbraith, electrical engineer West Penn Steel Co., Brackenridge, Pa.; second vice-president, R. L. Shoemaker, superintendent of maintenance American Rolling Mill Co., Middletown, Ohio; directors, A. C. Cummins, electrical superintendent Carnegie Steel Co., Duquesne, Pa.; E. H. Wentz, electrical superintendent National Tube Co., Lorain, Ohio; B. G. Beek, electrical engineer American Sheet & Tin Plate Co., Gary, Ind.; George Schaeffer, electrical superintendent Carpenter Steel Co., Reading, Pa., and A. L. Freret, assistant chief electrical engineer Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.; treasurer, John Farrington, electrical superintendent LaBelle Iron Works, Steubenville, Ohio; secretary, John F. Kelly, Pittsburgh.

Papers and Discussions

L. W. Heller, general superintendent power stations, Duquesne Light Co., Pittsburgh, in a paper on "Steam Turbine Operation," said that the trend of steam turbine manufacture at present seems to be toward increasing the reliability of the equipment and refinement in design, and manufacture and operation are receiving more attention than ever before. His paper was devoted largely to a discussion of the methods used by the Duquesne Light Co. in the operation of its steam generating equipment. Tables were presented showing increasing size of the units installed, and their thermal efficiency and average performance. The author held that the larger capacity power stations now required make the installation of turbine driven units desirable, and pointed out that the concentration of power allowed by these insulations means the saving of building space and the operation of greater power with a smaller number of attendants.

"Internal Combustion Engines for Power Generation in Steel Mills" was the subject of a paper by D. M. Petty, electrical engineer Bethlehem Steel Co., South Bethlehem, Pa., a gas engine rated at 4000 kw. being taken as the basis. A table was given showing that the average installed cost of a gas engine power plant, made up of three or more 4000-kw. units, is $132 per kw. Operating costs were also tabulated. A 2700-kw. Diesel oil engine was also discussed. The speaker called attention to one point for future improvement in net operating efficiency, in the utilization of the heat contained in the exhaust gases. He said that reclaiming this energy is somewhat similar to the application of condensers to the steam turbine and that this field is merely scratched to-day in a few plants where boiler feed water is heated in a small way.

He pointed out that one of the principal items in operating costs in the past, the renewal of worn steel parts such as cylinders, piston rods, etc., has been materially reduced by the use of electric welding. Formerly, when the grooves of the piston became worn sufficiently to cause excessive leakage, it was necessary to remachine them and put in oversize piston rings. Now the worn pieces are filled by electric welding and machined out so that the life of the steel piston is almost indefinite. Formerly cylinders had to be scrapped because of cracks, but these are now welded. Cast steel was favored for gas engine parts because it can be welded, as well as for other reasons. Comparing internal combustion engines with steam engines for power station work the speaker pointed out that one great weakness of the steam power station is its standby losses or the coal that must be burned under the boilers to keep up steam pressure when all the power generating apparatus is shut down.

There was an interesting combined discussion on the two papers of steam turbine operation and internal combustion engines for steel plants, which brought out varying views on reliability, fuel costs, cost of repairs, etc., and some conflicting opinions as to the comparative merits of gas engines and steam engines in steel plants. W. M. Hampton, superintendent gas engine department of the Gary works of the Illinois Steel Co., discussed the operation of gas engines at that plant, where electricity is largely generated by the use of 56 gas engines. These engines at Gary are loaded up to their maximum power and steam turbines take the fluctuation in the load. Gas engines have proved their efficiency and reliability after nearly fifteen years of service and the United States Steel Corporation, particularly the Illinois Steel Co., is still buying gas engines. He declared that repair costs compare favorably with those for steam units of the same sizes. While some cylinders have cracked, others have been used fourteen years.

This discussion brought out remarks regarding more extensive uses of gas in steel plants. J. R. McDermott, chief engineer South works of the Illinois Steel Co., Chicago, favored developing the use of blast furnace gas for heating and melting in steel plants. He said that the South works has a gas surplus for reheating and contemplates its use for the open-hearth furnaces. R. B. Gerhardt stated that the Bethlehem Steel Co. proposes to use a mixture of blast furnace and coke oven

gas for heating furnaces, soaking pits, annealing furnaces and eventually for its open-hearth furnaces.

Combustion and Boiler Practice

W. W. Witting, assistant chief engineer Illinois Steel Co., Gary, Ind., presented a comprehensive paper on "Judging the Combustion of Gaseous Fuel from Gas Analysis" which indicated a large amount of research work on his part. He stated that fuel losses in a large steel plant are great, in spite of efforts to minimize them. Efforts are made to cut down fuel consumption and to obtain perfect combustion with a minimum surplus of air. In pursuit of this goal efforts are directed toward finding improved methods of producing such combustion, and the author stated that there is large room for improvement in design of burners, furnaces,, etc., but that even of greater importance is the most efficient handling of equipment. He advocated the better utilization of the waste gas analysis and warned against the indiscriminate use of gas analyses. Various formulas were embodied in the paper. The writer stated that his purpose was to call attention to the fact that guesswork can be eliminated from the solution of combustion problems by means of waste gas analysis and to present a method that will extend the possibilities of their application. Another purpose was to point out the error that he declared is commonly committed in judging the quality and heating value of producer gas entirely from an analysis of the fixed gases it contained and neglecting the tarry vapors.

A topical discussion was held on "Boiler Practices of 1922." J. B. Crane, Geo. T. Ladd Co., Pittsburgh, Pa., discussed the present tendency in boiler design and said that with increasing cost of coal, higher boiler pressure and greater average loads economizers are justified on an investment basis in more cases than heretofore. R. E. Butler, Babcock & Wilcox Co., said that the average size boiler for large industrial plants is now probably around 1000 hp. as compared with 500 hp. ten years ago. To attain higher efficiency from boiler units more heating surface is being installed per foot of furnace width. The advantages of mechanical operation recently have led to experiments in the use of coal on forced blast chain grates and in a powdered form, blown into the furnace. In his opinion the blast chain grate seems particularly adapted to the lower grades of coal and coke braize. Theoretically the burning of powdered coal in suspension is an ideal way, but he declared a number of difficulties must be overcome before this method will to any great extent supersede the under feed stoker or blast chain grate stoker. R. M. Rush, Springfield Boiler Co., Pittsburgh, Pa., discussed the modern sectional head boiler and E. R. Fish and Alfred Cotton, Heine Power Co., St. Louis, discussed the Heine boiler practice.

Electrification

"A Review of Steel Mill Electrification," prepared by B. G. Lamme, chief engineer Westinghouse Electric & Mfg. Co., and W. Sykes, vice-president Canadian American Alloy Corporation, was read by G. E. Stoltz of the Westinghouse company. The writers held that one of the great defects of individual power plants of large industries is that the plant has not been laid out for future needs. Extensions are made as required but without looking ahead. With practice crystallizing in certain directions there is no longer much excuse for haphazard power developments. Mixed systems and mixed operations almost always represent a handicap in some form.

The authors held that from an efficiency standpoint the electric system as a whole is far ahead of anything else in power generation, transmission and utilization; from the flexibility standpoint it possesses great advantages and from the durability and maintenance standpoints electrical machinery ranks high. It was declared that the general trend in all industries is toward electrification and that there is a tendency toward securing power from central plants. The development of adequate and reliable gearing was credited with being a great impetus to the advance of electric drive.

One objection found to the use of steam for a prime mover was that a power house is usually located close to the blast furnace to use the blast furnace gas and as the plant expands either long steam lines are required to supply distant power units or a multiplicity of power plants is required, both of which were declared uneconomical. In case of steam-driven units the power unit under the best conditions of load is less economical than a turbo generator unit.

Operating figures were checked up for two plants producing largely the same class of products and having approximately the same tonnages, one being electrically and the other steam driven. After making due allowances in every case for the value of blast furnace gas used and making adjustments for slight variations in the output, the figures showed that the electrically driven plant produced steel at between $3 and $4 per ton less than the steam-driven plant. Another investigation gave the electrically driven plant an advantage of $2.50 per ton. The only comments on the paper were made by Dr. Unger, research department Carnegie Steel Co., who expressed the view that electricity will replace mechanical movers in steel plants.

"Generating Station Development" was discussed by David R. Rushmore and E. Pragst, General Electric Co., Schenectady, N. Y. Their paper called attention to the increase in capacity and efficiency of hydro-electric units, to marked advancement in turbine design, to rapid boiler development and to the increase in boiler size. The paper stated that it has been considered impractical in most cases to burn coal on stokers and gas in the same furnace. However, the Ford installation at River Rouge has proved that it is practical to burn both fuels in the same furnace, thus materially reducing the boiler capacity and resulting in various other economies.

It was declared that the developments in turbines during the past two or three years have been more pronounced than during any similar period. Attention was called to a recent development in air-cooling systems for use in connection with generators which should be of particular interest to the iron and steel industry. This includes a closed air circulating system and water sprays for cooling the air before it again re-enters the generator. The system is expected to find its principal application where impure air only is available for cooling. Looking into the future, the writers predicted the use of new fuels and among them probably the use of the energy of the sun as stored in plant life and utilized in some such form as alcohol.

F. C. Watson, electrical superintendent International Nickel Co., described in detail that company's works for the manufacture of monel metal at Huntington, W. Va.

Separation of Power Production from Manufacturing

A paper by Charles P. Steinmetz, chief consulting engineer General Electric Co., on "Improvement in Efficiency of Electric Power Supply" attracted an unusual amount of interest because of the author's prominence. He declared that power production has become a separate industry and that the best economy requires the separation of power production from the industries it serves. Economy also requires that by-product power of an industry be not wasted, even partly, but that it be used to its fullest extent for raw material for power. Power production is cheaper in large central stations than in small isolated stations. However, it would be uneconomical for an industry like the steel industry, producing blast furnace gas, to pay for power and waste the gas. Where considerable energy is available as a by-product of an industry this may be converted into power at a lower cost than power bought from a central station. Theoretically the most economical arrangement between a local station using the by-product energy of an industrial plant and a central power station would be an interchanging of power, power deficiencies being supplied by a central station, which would take any surplus power that might be produced by the isolated station.

Dr. Steinmetz held that the difficult problem in the relation between the electric power company and the individual corporations that use electric power and produce by-product energy is the financial one of the rate for power and energy. These rates should be based on

cost plus a fair profit. However, this is often difficult to work out, owing to the uncertainty as to the cost, this applying to the electric power and to the by-product energy such as blast furnace gas. He said that the best way to solve the problem would be to work out the engineering economy of the relation without regard to the rate question, and have a committee of both corporations make a continued study of the cost relations with a view to arriving at a fair agreement. He believed that a great step in the industrial development of the country would be taken were these economy relations worked out between a power company and a company producing by-product energy.

"The Electrification of Steel Plant Railroad Yards" was discussed by R. B. Gerhardt, electrical superintendent Bethlehem Steel Co., who dwelt on the power supply, conductor rail location and the locomotive design. He expressed the opinion that the day is almost here when the steam locomotive will take a back seat in some of the steel plants. In the discussion, Chairman W. S. Hall stated he was inclined to think that the electrification of steel plant yards depends almost wholly on the individual plants but he believed the tendency in the direction of electrification. E. Friedlander, Carnegie Steel Co., Braddock, Pa., said he did not think there is a steel plant in the country that could not electrify its yard. At his plant a third rail system has been operated for three years without an accident and the replacing of 25 steam locomotives with electric locomotives is being considered. He thought storage battery locomotives, where 12 or more are used, would be unsatisfactory, and held that a third rail track could be put anywhere in the mill yard, even in front of a blast furnace. Dr. Steinmetz discussed some of the electric problems involved and Dr. Unger predicted that in time all mill yards will be electrified.

Reports of Technical Committees

A comprehensive report of the Electrical Development Committee was submitted by its chairman, R. B. Gerhardt. A list was given of the main roll drives installed or placed on order during the year. Named as of foremost importance was the main roll drive ordered by the Youngstown Sheet & Tube Co. for a 30-in. reversing universal skelp mill. The list showed several mills of the continuous type using individual motor drives for separate stands. It was pointed out that, by the introduction of individual motors, particularly on the finishing stands, the speed relations between these stands can be adjusted and, due to the very flat relations, this speed is maintained regardless of the load. With this advantage the delivery speed of the mill can be increased and larger tonnages rolled at higher temperatures, so that more accurate gages are obtained. The list also showed a tendency to use direct current motors supplied by power from a motor generator set or a rotary converter, in preference to obtaining adjustable speed by means of auxiliary equipment used in connection with a wound rotor motor. The use of d.c. motors, particularly where several are desired, simplifies the equipment considerably, which reduces the amount of attention and inspection required.

Attention was called to a new type of variable speed alternating current motor drive known as the frequency converter set, the first installation of this kind having been made at the plant of the Scullin Steel Co., St. Louis. Another development was a new type of speed control for rod steel drives. This will keep the speed of the reels in synchronism with the delivery speed of the mill at all times. The a.c. adjustable speed brush shifting motor, although applied several years ago, has recently begun to receive the prominence to which it is entitled. Its particular field of application is in driving variable speed loads of high load factor, where the efficiency of operation is of importance, as in the case of draft fans, pumps, etc. The report stated that there has been a continuous effort on the part of power house designers and manufacturers of apparatus to improve the methods and means of electric energy production. Other means of increasing station economies were probably overshadowed by two more fundamental ones, namely, an increase in prime mover thermal economy and an increase in the range of the heat cycle. Steam turbines have been greatly improved in detail during the past year and substantial advancement has been made in generator design. The steel industry requirements for oil breakers during the past year have shown a tendency toward the isolated cell type, with increased rupturing capacity and voltage rating.

Satisfactory advance during the year in the use of industrial heating in the iron and steel industry was reported. Consideration has been given in one or two cases to the possibilities of electrically heated soaking pits. Several steel plants have considered the metallic resistor type of furnace for low temperature heat treatment. In general, however, the possibilities of this type of furnace for working up to a temperature of 2000 deg. Fahr. have not been followed by steel manufacturers to the same extent as in industries using steel in making their products. In arc welding the principal developments during the year were in the modification and adaptation of the automatic arc welder.

On the subject of yard electrification, the committee stated that several large steel plants have this under consideration. The merits of each type of electric locomotive depends to some extent on the particular plant but, from a purely economical standpoint, the committee stated that the straight locomotive has considerable advantages over the storage battery or combination locomotive. The storage battery type has reached a high state of development in the mining industry and the committee saw no reason why the mining type cannot be enlarged to fill the needs of the steel plant. On the subject of lighting, reference was made to a new form of filament lamp with a tipless bulb which is regarded as exceptionally serviceable for portable cords and drop lights.

F. W. Cramer, engineer of tests Cambria Steel Co., chairman of the control committee, reported that for ten years the committee had devoted its time to the problems of control standardization but, other than submitting reports making recommendations, the work has produced no tangible results. Consequently, this year it was desired to have a subcommittee on control located in each of its section districts to obtain a general opinion of steel producers on what is desired in the way of standardization. The committee believed that the association should suggest to electrical manufacturers that all new designs contemplated should be submitted to a committee for approval or criticism. By following this plan, standardization could be gradually brought about.

Reports submitted by the Pittsburgh, Chicago, Philadelphia, Cleveland and Youngstown sections indicated that, while there is a difference of opinion as to the way standardization should be carried out and what part should be given first consideration, there is a great demand for standard parts. Following the recommendation of the committee, the association passed a resolution requesting the Cutler-Hammer Co., Electric Controller & Mfg. Co., General Electric Co. and Westinghouse Co. to delegate two men each to meet with the committee of the association to devise ways and means of standardizing contractor ratings, grid resistance and other parts of control apparatus, with a view to reducing the number of spare parts that a user must carry in stock.

In its report, submitted by R. G. Bauer, electrical engineer Clairton works of the Carnegie Steel Co., Clairton, Pa., the sub-committee on illumination stated that the incandescent lamp is now almost universally used, R. L. M. standard reflectors are used extensively throughout steel plants and safety requirements are given first consideration, resulting in lamps being placed in accessible places and provided with hangers for lowering. The committee adopted a plan of compiling solutions of different lighting problems. In one case marine fittings replace wire guards to shield lamp globes that were a target for boys. In one plant breakage of yard lamps and shades was cut down by using stationary instead of swinging fixtures.

Through D. M. Petty, Bethlehem Steel Co., the standardization sub-committee on motors recommended the appointment of a committee to confer with a committee of the Boiler Club to devise ways and means of standardizing ratings and dimensions for mill type motors.

A questionnaire on the use of anti-friction bearings was sent to 25 of the largest steel plants and the tabulation showed that the highest percentage of motor failures was due to oil. Some of the replies indicated that most of the failures could be eliminated by roller bearings. The committee recommended that bearing and motor manufacturers adopt standard anti-friction bearings.

In the report submitted by F. A. Wiley, electrical superintendent Wisconsin Steel Works, South Chicago, the safety committee declared that the accident problems involve two essential elements, safeguarding and education. An organization plan for safeguarding and a list of general safety rules were submitted.

Exhibits

The exhibitors included the following:

Cleveland Crane & Engineering Co., Wickliffe, Ohio, tramrail system equipped with a hook for handling wire coils; VanDorn Electric Tool Co., Cleveland, drill, reaming and grinding machines; American Blower Co., Detroit, fans; Johns-Manville, Inc., New York, insulating material; Baker R & L Co., Cleveland, trucks and tractors; Chicago Pneumatic Tool Co., New York, drilling machines; Taylor Instrument Companies, pyrometers; Allen Bradley Co., Milwaukee, electric controlling devices; Atlas Car & Mfg. Co., Cleveland, low lift storage battery trucks; Reliance Electric & Engineering Co., Cleveland, motors; Wilson Welder Metals Co., New York, welding outfits; Cutler-Hammer Mfg. Co., Milwaukee, 60-in. magnetic clutch; Leeds & Northrup, Philadelphia, electric furnace; American Steel & Wire Co., Cleveland, cable and other wire products; Hayward Co., New York, buckets; Alliance Machine Co. Alliance, Ohio, models of ladle, crane and other trolleys; R. H. Beaumont Co., Philadelphia, miniature skip hoisting system, steel bunker and coal weighing larry; Electric Controller & Mfg. Co., Cleveland, control equipment and lifting magnets; Westinghouse Electric & Mfg. Co., control panels, automatic pressure regulators, safety switches, arc welding outfits, electric furnace and lighting equipment; National Lamp Works, and Ivanhoe Regent Works of General Electric Co., Cleveland, lamps and reflectors; General Electric Co., Schenectady, N. Y., 40-ton storage battery locomotive, arc welding machine, control panels; Crocker-Wheeler Co., Ampere, N. J., motors; Cutler Electric & Mfg. Co., Philadelphia, circuit breakers; Mercury Mfg. Co., Chicago, tractors; R. D. Nuttall Co., Pittsburgh, helical gears; Mutual Electric & Machine Co., Atlanta, Ga., safety switches; Tool Steel Gear & Pinion Co., gears and pinions; Thompson Electric Co., Cleveland, lighting fixtures; Aldrich Pump Co., Allentown, Pa., hydraulic pumps; Lakewood Engineering Co., Cleveland, clam shell bucket, tractors and lifting trucks; Louis Allis Co., Milwaukee, motors; Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., electric hoists; Euclid Crane Hoist Co., Euclid, Ohio, hoists and switches; Ohio Electric & Controller Co., Cleveland, controllers; Pittsburgh Transformer Co., Pittsburgh, transformers; S. K. F. Industries, Inc., New York, ball bearings.

Welding Meeting in Chicago

The fall meeting of the American Welding Society will be held in Chicago, Oct. 2, 3, 4 and 5, in the rooms of the Western Society of Engineers, 1735 Monadnock Block. Among the committee reports to receive consideration are the following: Specifications for steel to be welded, W. J. Beck, chairman; electric arc welding, H. M. Hobart, chairman; gas welding, S. W. Miller, Union Carbide and Carbon Research Laboratories, chairman; welded rail joints, Dr. G. K. Burgess, Bureau of Standards, chairman.

Among the papers scheduled are the following: Gas Welding of Cast Iron, by S. W. Miller; Thermit Welding and Cast Iron, by J. H. Deppeler, chief engineer Metal & Thermit Corporation; Electric-Arc Welding of Cast Iron, by William Namack, Davison-Namack Foundry Co.

Co-operation Between Engineering School and Foundries

LAFAYETTE, IND., Sept. 14.—During July and August E. E. Wendt, of the engineering staff of Purdue University, visited 57 foundries in Indiana and interviewed 100 foundrymen in an effort to help them solve their problems. Mr. Wendt teaches foundry work. Many of the foundrymen were in favor of holding a conference or meeting at Purdue University next spring and a number expressed a willingness to take Purdue students into their plants during the summer vacations.

Machine Tool Exhibition at New Haven

The machine tool exhibition to be held at the Mason Laboratory of mechanical engineering of Yale University, New Haven, under the auspices of the New Haven branch of the American Society of Mechanical Engineers, Yale University, and the New Haven Chamber of Commerce, is taking on large proportions. It will be opened at 7 p.m., daylight saving time, Thursday, Sept. 21, and will be open in the daytime on both Friday and Saturday. The list of exhibitors numbers 109 and comprises mostly New England manufacturers of machine tools and machine shop accessories with a number of scattering exhibits from other parts of the country. It is planned to have motion pictures on all three evenings and speakers of authority on a number of subjects. There is no admission charge for spectators. The exhibition is a co-operative undertaking intended to serve manufacturers, buyers and users of machine tools with the idea of helping to improve business conditions, particularly in New England.

The tentative program of speakers includes the following: Dean Charles H. Warren, Sheffield Scientific School, on Co-operation between the Colleges and the Machine-Tool Industry; Henry B. Sargent, Sargent & Co., New Haven; Melville D. Liming, of the Boston Chamber of Commerce, on outlook for industry in New England; Earle Buckingham on machine tools, standardization and interchangeable manufacture; Oscar R. Wikander on standardization activity in Germany; William Calkins on design, manufacture and performance of twist drills; Gardner T. Swarts, Jr., on application of graphic control to machine-tool manufacture; and Oswald W. Knauth, secretary National Bureau of Economic Research, on analysis of income in the United States.

The National Association of Farm Equipment Manufacturers will hold its twenty-ninth annual convention at the Congress Hotel, Chicago, Oct. 18 to 20, inclusive. The program has not yet been announced.

COMING MEETINGS

September

Machine Tool Exhibition. Sept. 21, 22 and 23. Mason Laboratory, Yale University, New Haven, Conn. Connecticut section American Society of Mechanical Engineers. Harry R. Westcott, 207 Orange Street, New Haven, Chairman Exhibition Committee.

American Electrochemical Society. Sept. 21, 22 and 23. Fall meeting, Windsor Hotel, Montreal, Canada. Secretary, Dr. Colin G. Fink, Columbia University, New York.

American Institute of Mining and Metallurgical Engineers. Sept. 25 to 29. Pacific Coast meeting, Engineers' Club, San Francisco. Secretary, F. F. Sharpless, 29 West Thirty-ninth Street, New York.

October

American Society for Steel Treating. Oct. 2 to 7. Convention and exposition, General Motors Co. Building, Detroit. Secretary, W. H. Eisenman, 4600 Prospect Avenue, Cleveland.

American Drop Forging Institute. Oct. 3 to 6. Annual convention, General Motors Building, Detroit. Commissioners, Scovell, Wellington & Co., 1168 Hanna Building, Cleveland.

Society of Industrial Engineers. Oct. 18 to 20. McAlpin Hotel, New York. Business manager, George C. Dent, 327 South LaSalle Street, Chicago.

American Gear Manufacturers' Association. Oct. 9, 10 and 11. Semi-annual meeting, Chicago. Secretary, T. W. Owen, 2443 Prospect Avenue, S. E., Cleveland.

Labor Problems in Electric Melting*

Best Melter One with No Previous Furnace Training—Bonus for Charging—Metallurgist in Charge of Laboratory and Furnaces

BY CHARLES WELLMAN FRANCIS

THERE is a great tendency to use foreign labor in present-day electric furnace practice. This fact may be partly explained by the inability to get American-born laborers to stick to furnace work. While the alien often makes a good, steady workman on the furnaces, his inability to cope with emergencies, due largely to the fact that he does not readily comprehend the orders given him, is a great handicap to him on a job where quick action is often necessary. The foreigner trains himself to go about his duties in sequence and, by observing what other workmen on similar jobs at his side are doing, he thus becomes methodical in various tasks. This attribute is a valuable one provided his fellow workmen are of the proper caliber; otherwise he often becomes a detriment to the department.

Training a Melter

In training a man for the position of melter it is essential to secure one of at least the average intelligence who is English-speaking, active and energetic. It is my experience that the man who has had no previous furnace training often makes the most receptive pupil and finally develops into the best melter. Many electric steel foundry executives have tried at short notice to break in converter blowers as melters, or have taken an open-hearth helper for a melter rather than pay the higher salary for a man who thoroughly understands the electric furnace, only to change their policy after they have paid dearly for the experiment. It is not intended to detract from the ability of the converter or open-hearth men in this respect, for they were placed in a position which they could not learn in a week, the entire situation tending in many instances to give the electric furnace the discredit which it in no way deserved.

One side of the labor question vital to the highest efficiency in electric furnace operation is the attitude of the melter toward his furnace helpers. I regret to say that there are certain types of experienced workmen, especially among steel melters, who hide the scrap of paper on which they figure a furnace charge or work out an alloy addition as though it were the only thing that kept them from being discharged. Fortunately this narrow-mindedness is gradually being eliminated, especially so in the last few years when more young college and university men are getting into electric furnace departments.

Metallurgist in Charge of Furnaces

There are very few furnace departments in which we do not find the melter and the chemist at times working at odds. These differences, perhaps petty, often lead to more serious troubles, which in turn are sometimes more noticeable than the results both men should desire to obtain. A good arrangement is to have a metallurgist who is both a steel melter and a chemist in charge of both laboratory and furnaces. The chemist will report to the metallurgist on the analysis of preliminary heat tests, together with the time required to make the determinations, while the melter will make a report to the metallurgist on the alloy additions he makes as a result of the chemist's analysis. Thus the majority of the friction can be eliminated.

Probably the greatest labor problem encountered is that of the furnace charging. It is difficult to get men to stick to the work, especially in hot weather. The best plan is to place this work on a bonus basis, allowing a certain length of time for charging a given amount of scrap. If the men better this time, pay them extra money at a given rate per minute for each minute less than the allotted time. This will give an incentive for fast work and at the same time the melter must see that the furnace is not charged carelessly.

Friction Between Electricians and Furnacemen

There is often considerable friction between the electricians and the furnace helpers which is absolutely unnecessary. This often comes when the electric furnace helpers begin to feel that they know the electrical side of the installation as well as the electricians themselves. Consequently when electrical troubles arise, instead of calling immediately for the electricians, they try to remedy the difficulty themselves and often make matters worse. I have seen this occur time after time, especially concerning the automatic electrode regulators. These electro-mechanical devices for manipulating the electrodes are extremely sensitive equipment, and no one should be permitted to tamper with them who does not thoroughly understand their workings.

The heats come so fast and frequently from an electric furnace, especially the acid furnace, that unless the proper supervision and co-operation of the helpers is given, the entire equipment will soon become extremely dirty; this in many instances has been the cause of long delays and even accidents and injuries.

There are a number of tasks about the furnace which must be performed after each heat if the equipment is to be kept in the best working condition; namely, cleaning out the furnace pit and placing clean dry sand on the bottom; blowing off the furnace roof with an air hose; repairing the sill of the charging door and the runway of the pouring spout, also a thorough cleaning of the switchboard and panels by means of an air hose. The use of an air hose on the electrode arms is advisable about once a day, because the dust which settles in the foundry is very high in iron and consequently may readily cause the breaking down of the insulation, which might result in the short-circuiting of the equipment and burning out of some very valuable parts, hard to replace at short notice. It is for this same reason that the furnace sub-station should be sealed as tightly as possible to prevent this iron-impregnated dust from settling.

Familiarity with the workings of an electric furnace frequently makes furnace helpers exceedingly careless around the electrical equipment. One habit which they often acquire first is to push or pull the

(*Concluded on page* 763)

*In the issue of July 27, p. 201, the author discussed the choice of an electric furnace; in the issue of Aug. 3, p. 277, the economy features of electric foundry design and equipment; in the issue of Aug. 10, p. 345, acid electric furnace practice; in the issue of Aug. 17, p. 421, basic electric furnace operation, and in the issue of Aug. 31, p. 525, costs of electric melting. This is the concluding article.

Metal Duties in Fordney-McCumber Tariff

A Return to Protection, with High Rates on Ferroalloys and Raw Materials—President May Be Called on to Change These—Foreign Valuation the Basis

BY L. W. MOFFETT

WASHINGTON, Sept. 19.—With the passage of the new Fordney-McCumber bill, the country returns to a protective tariff, and on the whole the measure is quite similar to the Payne-Aldrich act so far as rates are concerned. This is reflected in the metal and other schedules, though in some respects the metal schedule carries high rates not even approached previously. This is particularly true of the ferroalloy and cutlery sections. The rates on rolled steel products, however, do not vary much from, and in some cases are identical with, the Payne-Aldrich rates. All duties when on an ad valorem basis are fixed on foreign valuation.

The chief factors in making the rates, perhaps, were the so-called agricultural bloc and the Western mining interests, as shown by the protection given on their products and the reduction in rates on some of the products they consume. The metal schedule has been left in the form in which it was reported out by the conference.

The most significant portions of the new measure, however, are its administrative features. Outstanding among these is a provision which establishes an altogether new method of handling the tariff. By some it is interpreted as to an extent taking the tariff out of politics, though obviously it is far from doing this completely. This provision relates to authority granted the President, at his request, to determine flexible rates under certain conditions, more fully described elsewhere in this issue. Directly related is another provision giving broader authority to the United States Tariff Commission and in a degree providing for reorganization of the commission.

Possible Changes in Iron and Steel Duties

It now becomes an interesting question as to the use that will be made of these provisions. For instance, it is quite conceivable that iron and steel interests, who are greatly dissatisfied with the duties levied on raw products they consume, will appeal under these provisions to have an investigation made by the commission and to have the President reduce the duties through proclamation. At the same time the right is given to interests supplying these, as well as all other products, to ask for an investigation and request that the President through the same course increase the duties, which may be fixed on either foreign or American valuation. The iron and steel trade, as is well known, strongly opposed the duties fixed on manganese ore, ferromanganese, ferrosilicon, magnesite and several other products. The new administrative features are held to be a substantial move toward a scientific tariff; and while opposition to them has been raised on the ground that they are unconstitutional, it was broken down and the features adopted. They yet may become the subject of tests in the courts. Under the new provisions the Tariff Commission is clothed with authority to study conditions under the existing tariff law and report upon the competitive conditions in American industry with respect to the relationship between the domestic and foreign branches of the industry and state what rates would be needed to equalize those conditions. Previously the commission had no authority to make recommendations as to rates.

The metal schedule itself was the object of prolonged hearings and considerable debate on the floors of Congress, especially in the Senate. Independent iron and steel interests made suggestions as to rates, and while some were adopted, many were disregarded, particularly as to the ferroalloy section. Most of the rates on the rolled products met with no strong opposition from the industry, though suggestions were made which would have balanced the schedule more satisfactorily. An example is the disposition made of barbed wire, in compliance with the supposed wishes of agricultural interests. This commodity is left on the free list. While it is just as costly to make because of labor and other costs as other forms of wire, it is left free of duty, while wire products in general are made dutiable.

The new tariff measure was before Congress for an unusually long period, even for legislation of this kind, traditionally a party issue. Hearings were started before the House Committee on Ways and Means on Jan. 6, 1921. The bill was passed in the House on July 21, 1921, and it was passed by the Senate on Aug. 19, 1922, after which it was reported to conference. The Underwood-Simmons bill was under consideration from April to October, 1913.

Below is given the metal schedule of the new act. Inserted in the schedule are the corresponding provisions of the Underwood-Simmons tariff and of the previous tariff, the Payne-Aldrich act. The Underwood-Simmons duties are given in parentheses ( ), while the Payne-Aldrich duties are given in brackets [ ].

New Duties Compared with Underwood Schedules

301. Iron in pigs, iron kentledge, spiegeleisen (all on free list) [all $2.50 per ton] containing more than 1 per cent of carbon, 75c. per ton; wrought and cast scrap iron, and scrap steel, (all scrap on free list) [scrap $1 per ton] valued at not more than 7c. per lb., 75c. per ton: Provided, That spiegeleisen for the purpose of this Act shall be an iron manganese alloy containing less than 30 per cent of manganese: Provided further, That nothing shall be deemed scrap iron or scrap steel except secondhand or waste or refuse iron or steel fit only to be remanufactured.

302. Manganese ore or concentrates containing in excess of 30 per cent of metallic manganese, (free list) 1c. per lb. on the metallic manganese contained therein; molybdenum ore or concentrates, 35c. per lb. on the metallic

molybdenum contained therein; tungsten ore or concentrates, 45c. per lb. on the metallic tungsten contained therein; ferromanganese containing more than 1 per cent of carbon, (free list) [$2.50 per pound] 1⅞c. per lb. on the metallic manganese contained therein: Provided, That ferromanganese for the purpose of this Act shall be such iron manganese alloys as contain 30 per cent or more of manganese; manganese metal, manganese silicon, manganese boron, and ferromanganese and spiegeleisen containing not more than 1 per cent of carbon, (free list) [$2.50 per ton] 1⅞c. per lb. on the manganese contained therein and 15 per cent ad valorem; ferromolybdenum, metallic molybdenum, molybdenum powder, calcium molybdate, and all other compounds and alloys of molybdenum, 50c. per lb. on the molybdenum contained therein and 15 per cent ad valorem; ferrotungsten, metallic tungsten, tungsten powder, tungstic acid, and all other compounds of tungsten, 60c. per lb. on the tungsten contained therein and 25 per cent ad valorem; ferrochromium tungsten, chromium tungsten, chromium cobalt tungsten, tungsten nickel, and all other alloys of tungsten not specially provided for, 60c. per lb. on the tungsten contained therein and 25 per cent ad valorem; ferrosilicon, containing 8 per cent or more silicon and less than 60 per cent, 2c. per lb. on the silicon contained therein; containing 60 per cent or more of silicon and less than 80 per cent, 3c. per lb. on the silicon contained therein; containing 80 per cent or more of silicon and less than 90 per cent, 4c. per lb. on the silicon contained therein; containing 90 per cent or more silicon, and silicon metal, 8c. per lb. on the silicon contained therein; ferrochrome or ferrochromium containing 3 per cent or more of carbon, 3½c. per lb. on the chromium contained therein; ferrochrome or ferrochromium containing less than 3 per cent of carbon, and chrome or chromium metal, 30 per cent ad valorem; ferrophosphorus, ferrotitanium, ferrovanadium, ferrouranium, ferrozirconium, zirconiumferrosilicon, ferroboron, titanium, zirconium, chromium nickel, vanadium nickel, zirconium nickel, chromium vanadium, chromium silicon, zirconium silicon, calcium silicide, and all alloys used in the manufacture of steel not specially provided for, 25 per cent ad valorem; cerium metal, $2 per lb; ferrocerium and all other cerium alloys, $2 per lb. and 25 per cent ad valorem; ductile tantalum metal or ductile nonferrous alloys of tantalum metal, 40 per cent ad valorem. (ferroalloy paragraph carried 15 per cent) [ferroalloys 20 to 25 per cent]

303. Muck bars, bar iron, and round iron in coils or rods, iron in slabs, blooms, loops, or other forms less finished than iron in bars and more advanced than pig iron, except castings; all of the foregoing, valued at not over 1c. per lb., 2/10 of 1c. per lb.; valued above 1c. and not above 1½c. per lb., 3/10 of 1c. per lb.; valued above 1½ and not above 2½c. per lb., 5/10 of 1c. per lb.; valued above 2½ and not above 3½c. per lb., 8/10 of 1c. per lb.; valued above 3½ and not above 5c. per lb., 1c. per lb.; valued above 5c. per lb., 1½c. per lb. (5 per cent) [6/10c.. 4/10c. and 3/10c. per lb., according to size]

304. Steel ingots, cogged ingots, blooms and slabs, by whatever process made; die blocks or blanks; billets and bars, whether solid or hollow; shafting; pressed, sheared, or stamped shapes, not advanced in value or condition by any process or operation subsequent to the process of stamping; hammer molds or swaged steel; gun-barrel molds not in bars; alloys not specially provided for, used as substitutes for steel in the manufacture of tools; all descriptions and shapes of dry sand, loam, or iron molded steel castings; sheets and plates and steel not specially provided for; all of the foregoing valued at not over 1c. per lb., 2/10 of 1c. per lb. [7/40c. per lb. on value of ¾c. per lb. or less and ranging up to 4.6c. per lb. on value of 16c. to 24c.]; valued above 1c. and not above 1½c. per lb., 3/10 of 1c. per lb.; valued above 1½ and not above 2½c. per lb., 5/10 of 1c. per lb.; valued above 2½ and not above 3½c. per lb., 8/10 of 1c. per lb.; valued above 3½ and not above 5c. per lb., 1c. per lb.; valued above 5 and not above 8c. per lb., 1 7/10c. per lb.; valued above 8 and not above 12c. per lb., 2½c. per lb.; valued above 12 and not above 16c. per lb., 3½c. per lb.; valued above 16c. per lb., 20 per cent ad valorem: Provided, That on steel circular saw plates there shall be levied, collected and paid an additional duty of ¼ of 1c. per lb. (Ingots, billets, etc., by Bessemer, or open-hearth process, free list; electric, crucible and alloy ingots, etc., 15 per cent)

305. In addition to the rates of duty provided for in this schedule on steel in all forms and shapes, by whatever process made, and by whatever name designated, whether cast, hot or cold rolled, forged, stamped, or drawn, containing more than 6/10 of 1 per cent of nickel, cobalt, vanadium, chromium, tungsten, molybdenum, or any other metallic element used in alloying steel, there shall be levied, collected, and paid 8 per cent ad valorem: Provided, That manganese and silicon shall not be considered as alloying material unless present in the steel in excess of 1 per cent manganese or silicon: Provided further, That an additional cumulative duty of 65c. per lb. on the molybdenum content in excess of 6/10 of 1 per cent, and 72c. per lb. on the tungsten content in excess of 6/10 of 1 per cent shall be levied, collected, and paid on any material provided for in paragraph 304 containing molybdenum and tungsten.

306. All metal produced from iron or its ores, which is cast and malleable, of whatever description or form, without regard to the percentage of carbon contained therein, whether produced by cementation, or converted, cast, or made from iron or its ores, by the crucible, electric, Bessemer, Clapp-Griffith, pneumatic, Thomas-Gilchrist, basic, Siemens-Martin, or open-hearth process, or by the equivalent of either, or by a combination of two or more of the processes, or their equivalents, or by any fusion or other process which produces from iron or its ores a metal either granular or fibrous in structure, which is cast and malleable, excepting what is known as malleable-iron castings, shall be classed and denominated as steel.

307. Boiler or other plate iron or steel, except crucible plate steel and saw plate steel, not thinner than 100 9/1000 in., cut or sheared to shape or otherwise, or unsheared, and skelp iron or steel sheared or rolled in grooves, valued at 1c. per lb. or less, 7/20 of 1c. per lb. [from 3/10c. on 8/10c. value to 6/10c. on 3c. value]; valued above 1c. per lb. and not above 3c. per lb., 5/10 of 1c. per lb.; valued at over 3c. per lb., 20 per cent ad valorem [20 per cent]: Provided, That all sheets or plates of iron or steel thinner than 100 9/1000 in. [No. 11 to No. 12 wire gage] shall pay duty as iron or steel sheets. (all plates 12 per cent)

308. Sheets of iron or steel, common or black, of whatever dimensions, and skelp iron or steel, valued at 3c. per lb. or less, thinner than 100 9/1000 and not thinner than 38/1000 in., 45/100 of 1c. per lb.; thinner than 38/1000 and not thinner than 22/1000 in., 55/100 of 1c. per lb.; thinner than 22/1000 and not thinner than 10/1000 in., 75/100 of 1c. per lb.; thinner than 10/1000 in., 85/100 of 1c. per lb.; corrugated or crimped, 75/100 of 1c. per lb.; all the foregoing when valued at more than 3c. per lb., 20 per cent ad valorem: Provided, That all sheets or plates of common or black iron or steel not thinner than 100 9/1000 in. shall pay duty as plate iron or plate steel. (All black sheets 12 per cent) [5/10c. on 3c. value and less and thinner than No. 10 wire gage ranging up to 9/10c. on thinner than No. 32 gage; over 3c. value, 30 per cent]

309. All iron or steel sheets, plates, bars, and rods, and all hoop, band, or scroll iron or steel, excepting what are known commercially as tin plates, terneplates, and taggers tin, when galvanized or coated with zinc, spelter, or other metals, or any alloy of those metals, shall pay 2/10 of 1c. per lb. more duty [same] than if the same was not so galvanized or coated; sheets or plates composed of iron, steel, copper, nickel, or other metal with layers of other metal or metals imposed thereon by forging, hammering, rolling, or welding, 30 per cent ad valorem [40 per cent]; thermostatic metal in sheets, plates, or other forms, 50 per cent ad valorem (new provision); sheets and plates of iron or steel, polished, planished, or glanced, by whatever name designated, 1¼c. per lb. [1½c.]: Provided, That plates or sheets of iron or steel, by whatever name designated, other than polished, planished, or glanced, herein provided for, which have been pickled or cleaned by acid, or by any other material or process, or which are cold-rolled, smoothed only, not polished, shall pay 2/10 of 1c. per lb. [same] more duty than the rates provided on corresponding thicknesses of common or black sheet iron or steel. (For all above, except new provision 15 per cent ad valorem.)

310. Sheets or plates of iron or steel, or taggers iron or steel, coated with tin or lead, or with a mixture of which these metals, or either of them, is a component part, by the dipping or any other process, and commercially known as tin plates, terneplates, and taggers tin, 1c. per lb. [1.2c. per lb.]

311. No article not specially provided for which is wholly or partly manufactured from tin plate, terneplate, or sheet, plate, hoop, band, or scroll iron or steel, or of which such tin plate, terneplate, sheet, plate, hoop, band, or scroll iron or steel shall be the material of chief value, shall pay a lower rate of duty than that imposed on the tin plate, terneplate, or sheet, plate, hoop, band, or scroll iron or steel from which it is made, or of which it shall be the component thereof of chief value.

312. Beams, girders, joists, angles, channels, cartruck channels, tees, columns and posts, or parts or sections of columns and posts, deck and bulb beams, and building forms, together with all other structural shapes of iron or steel, not assembled, manufactured or advanced beyond hammering, rolling, or casting, 1/5 of 1c. per lb. (10 per cent) [3/10c. to 4/10c. per lb.]; any of the foregoing machined, drilled, punched, assembled, fitted, fabricated for use, or otherwise advanced beyond hammering, rolling, or casting, 20 per cent ad valorem (10 per cent) [45 per cent]; sashes, frames, and building forms, of iron or steel, 25 per cent ad valorem.

313. Hoop, band, and scroll iron or steel, not specially provided for, valued at 3c. per lb. or less, 8 in. or less in width, and thinner than 3/8 and not thinner than 100 9/1000 in., 25/100 of 1c. per lb. (10 per cent) [3/10c. per lb.]; thinner than 100 9/1000 and not thinner than 38/1000 in, 35/100 of 1c. per lb. (10 per cent) [4/10c. per lb.]; thinner than 38/1000 in., 55/100 of 1c. per lb. (10 per cent) [6/10c. per lb.]: Provided, That barrel hoops of iron or steel, and hoop or band iron, or hoop or band steel, flared, splayed, or punched, with or without buckles or fastenings, shall pay no more duty than that imposed on the hoop or band iron or steel from which they are made; bands and strips of iron or steel, whether in long or short lengths, not specially provided for, 25 per cent ad valorem. (10 per cent) [35 per cent]

314. Hoop or band iron, and hoop or band steel, cut to lengths, or wholly or partly manufactured into hoops or ties, coated or not coated with paint or any other preparation, with or without buckles or fastenings, for bailing cotton or any other commodity, ¼ of 1c. per lb. (free list) **[3/10c. per lb.]**

315. Wire rods: Rivet, screw, fence, and other iron or steel wire rods, whether round, oval, or square, or in any other shape, nail rods and flat rods up to 6 in. in width ready to be drawn or rolled into wire or strips, all the foregoing in coils or otherwise, valued at not over 4c. per lb., 3/10 of 1c. per lb. (10 per cent) [3/10c. per lb.]; valued at over 4c. per lb., 6/10 of 1c. per lb.; (10 per cent) [3/10c. per lb.] Provided, That all round iron or steel rods smaller than 20/100 in. in diameter shall be classified and dutiable as wire: Provided further, That all iron or steel wire rods which have been tempered or treated in any manner or partly manufactured shall pay an additional duty of ¼ of 1c. per lb. (10 per cent) [½c. per lb]: Provided further, That on all iron or steel bars and rods of whatever shape or section which are cold rolled, cold drawn, cold hammered, or polished in any way in addition to the ordinary process of hot rolling or hammering, there shall be paid ⅛ of 1c. per lb. [same] in addition to the rates provided on bars or rods of whatever section or shape which are hot rolled; and on all strips, plates, or sheets of iron or steel of whatever shape, other than polished, planished, or glanced sheet iron or sheet steel, which are cold hammered, blued, brightened, tempered, or polished by any process to such perfected surface finish or polish better than the grade of cold rolled, smoothed only, there shall be paid 2/10 of 1c. per lb. (10 per cent) [4/10c. per lb.] in addition to the rates provided on plates, strips, or sheets of iron or steel of common or black finish of corresponding thickness or value.

316. Round iron or steel wire, not smaller than 95/1000 in. in diameter, ¾ of 1c. per lb.; smaller than 95/1000 and not smaller than 65/1000 in. in diameter, 1¼c. per lb. (15 per cent) [1¼c. per lb.]; smaller than 65/1000 in. in diameter, 1½c. per lb. (15 per cent) [1¾c. per lb]: Provided, That all of the foregoing valued above 6c per lb. shall pay a duty of 25 per cent ad valorem; all wire composed of iron, steel, or other metal, not specially provided for (except gold, silver, or platinum); all flat wires and all steel in strips not thicker than ¼ in. and not exceeding 16 in. in width, whether in long or short lengths, in coils or otherwise, and whether rolled or drawn through dies or rolls, or otherwise produced, 25 per cent ad valorem (15 per cent) [35 per cent]: Provided, That all wire of iron, steel, or other metal coated by dipping, galvanizing, sherardizing, electrolytic, or any other process with zinc, tin, or other metal, shall pay a duty of 2/10 of 1c. per lb. in addition to the rate imposed on the wire of which it is made; [same] telegraph, telephone, and other wires and cables composed of iron, steel, or other metal (except gold, silver, or platinum), covered with or composed in part of cotton, jute, silk, enamel, lacquer, rubber, paper, compound, or other material, with or without metal covering, 35 per cent ad valorem (15 per cent) [40 per cent]; wire rope and wire strand, 35 per cent ad valorem; spinning and twisting ring travelers, 35 per cent ad valorem (30 per cent) [maximum wire duty and 1c. per lb.]; wire heddles and healds, 25c. per 1000 and 30 per cent ad valorem. (30 per cent) [25c. and 40 per cent.]

317. All galvanized wire not specially provided for, not larger than 20/100 and not smaller than 8/1000 in. in diameter, of the kind commonly used for fencing purposes, (free) [wire duty plus 2/10c. per lb.] galvanized wire fencing composed of wires not larger than 20/100 and not smaller than 8/100 in. in diameter, and all wire commonly used for baling hay or other commodities, ⅛ of 1c. per lb. (free) [not less than 40 per cent]

318. Woven-wire cloth: Gauze, fabric, or screen, made of wire composed of steel, brass, copper, bronze, or any other metal or alloy, not specially provided for, with meshes not finer than thirty wires to the lineal inch in warp or filling, 25 per cent ad valorem; with meshes finer than 30 and not finer than 90 wires to the lineal inch in warp or filling, 35 per cent ad valorem; with meshes finer than 90 wires to the lineal inch in warp or filling, 45 per cent ad valorem. (15 per cent) [maximum wire duty plus 1c. per lb.]

319. Iron or steel anchors and parts thereof [1c. per lb.]; forgings of iron or steel, or of combined iron and steel, not machined, tooled, or otherwise advanced in condition by any process or operation subsequent to the forging process, not specially provided for, 25 per cent ad valorem. (12 per cent) [30 per cent]

320. Electric storage batteries and parts thereof, storage battery plates, and storage battery plate material, wholly or partly manufactured, all the foregoing not specially provided for, 40 per cent ad valorem. (20 per cent) [45 per cent]

321. Antifriction balls and rollers, metal balls and rollers commonly used in ball or roller bearings, metal ball or roller bearings, and parts thereof, whether finished or unfinished, for whatever use intended, 10c. per lb. and 45 per cent ad valorem. (35 per cent) [45 per cent]

322. Railway fishplates or splice bars, and tie plates, made of iron or steel, ¼ of 1c. per lb. (10 per cent) [3/10c. per lb.]; rail braces, and all other railway bars made of iron or steel, and railway bars made in part of steel, T rails, and punched iron or steel flat rails, 1/10 of 1c. per lb. (free) [7/40c. per lb.]

323. Axles and parts thereof, axle bars, axle blanks, and forgings for axles, of iron or steel, without reference to the stage or state of manufacture, not specially provided for (10 per cent), valued at not more than 6c. per lb., 6/10 of 1c. per lb. [¾c. per lb.]: Provided, That when iron or steel axles are imported fitted in wheels, or parts of wheels, of iron or steel, they shall be dutiable at the same rate as the wheels in which they are fitted. (same) [same]

324. Wheels for railway purposes, and parts thereof, of iron or steel, and steel-tired wheels for railway purposes, wholly or partly finished, and iron or steel locomotive, car, or other railway tires and parts thereof, wholly or partly manufactured, 1c. per lb. (20 per cent) [1¼c. per lb.]: Provided, That when wheels for railway purposes, or parts thereof, of iron or steel, are imported with iron or steel axles fitted in them, the wheels and axles together shall be dutiable at the same rate as is provided for the wheels when imported separately.

325. Jewelers' and other anvils weighing less than 5 lb. each, 45 per cent ad valorem; all other anvils of iron or steel, or of iron and steel combined, by whatever process made, or in whatever stage of manufacture, 1⅝c. per lb. (15 per cent) [1⅝c. per lb.]

326. Blacksmiths' hammers, tongs, and sledges, track tools, wedges, and crowbars, of iron or steel, 1⅜c. per lb. (10 per cent) [1⅜c. per lb.]

327. Cast-iron pipe of every description [¼c. per lb.], cast-iron andirons, plates, stove plates, sadirons, tailors' irons, hatters' irons, but not including electric irons, and castings and vessels wholly of cast iron [8/10c. per lb.], including all castings of iron or cast-iron plates which have been chiseled, drilled, machined, or otherwise advanced in condition by processes or operations subsequent to the casting process but not made up into articles, or parts thereof, or finished machine parts [2/10c. per lb. extra]; castings of malleable iron not specially provided for [7/10c. per lb.]; cast hollow ware, coated, glazed, or tinned [1½c. per lb.], but not including enameled ware and hollow ware containing electrical elements, 20 per cent ad valorem. (All the above 10 per cent)

328. Lap-welded, butt-welded, seamed, or jointed iron or steel tubes, pipes, flues, and stays, not thinner than 65/1000 in. if not less than ⅜ in. in diameter, ¾ of 1c. per lb.; if less than ⅜ and not less than ¼ in. in diameter, 1¼c. per lb.; if less than ¼ in. in diameter, 1¾c. per lb: (All 20 per cent) [1c. to 2c.] Provided, That no tubes, pipes, flues, or stays made of charcoal iron shall pay a less rate of duty than 1¼c. per lb. [1½c.]; cylindrical and tubular tanks or vessels, for holding gas, liquids, or other material, whether full or empty; welded cylindrical furnaces, tubes and flues made from plate metal, whether corrugated, ribbed, or otherwise reinforced against collapsing pressure, and all other finished or unfinished iron or steel tubes not specially provided for, 25 per cent ad valorem [30 per cent]; flexible metal tubing or hose, whether covered with wire or other materials, including any appliances or attachments affixed thereto, not specially provided for, and rigid iron or steel tubes or pipes prepared and lined or coated in any manner suitable for use as conduits for electrical conductors, 30 per cent ad valorem. (all 20 per cent)

329. Chain and chains of all kinds, made of iron or steel, not less than ¾-in. in diameter, 7/8 of 1c. per lb.; less than ¾ and not less than ⅞ in. in diameter, 1⅛c. per lb.; less than ⅝ and not less than 5/16 in. in diameter, 2¼c. per lb.; less than 5/16 in. in diameter, 4c. per lb.; sprocket and machine chains, of iron or steel, and parts thereof, 35 per cent ad valorem (25 per cent); anchor or stud link chain, 2 in. or more in diameter, 1½c. per lb.; less than

2 in. in diameter, 2c. per lb. (All except sprocket and machine, 20 per cent) [chains ⅞ to 3c. per lb. but not less than 45 per cent]: Provided, That all articles manufactured wholly or in chief value of chain shall not pay a lower rate of duty than that imposed upon the chain of which it is made, or of which chain is the component material of chief value.

330. Nuts, nut blanks, and washers, of wrought iron or steel, 6/10 of 1c. per lb. (5 per cent); bolts, with or without threads or nuts, and bolt blanks, of iron or steel, 1c. per lb. (10 per cent); spiral nut locks, and lock washers, of iron or steel, 35 per cent ad valorem. (30 per cent) [all 1⅛c. per lb.]

331. Cut nails and cut spikes, of iron or steel [4/10. per lb.], exceeding 2 in. in length, 4/10 of 1c. per lb.; cut tacks and brads, hobnails and cut nails, of iron or steel, not exceeding 2 in. in length, 15 per cent ad valorem; horseshoe nails, and other iron or steel nails, not specially provided for, 1½c. per lb. [1½c. per lb.]; nails, spikes, tacks, brads, and staples, made of iron or steel wire, not less than 1 in. in length nor smaller than 65/1000 in. in diameter, 4/10 of 1c. per lb.; less than 1 in. in length and smaller than 65/1000 in. in diameter, ¾ of 1c. per lb. [⅝c. per 1000 to ¾c. per lb.]; spikes, tacks, brads, and staples, not specially provided for, 6/10 of 1c. per lb. (all on free list)

332. Rivets, studs, and steel points, lathed, machined, or brightened, and rivets or studs for nonskidding automobile tires, 30 per cent ad valorem (20 per cent) [45 per cent]; rivets of iron or steel, not specially provided for, 1c. per lb. (20 per cent) [1¼c. per lb.]

333. Common horse, mule, or ox shoes, of wrought iron or steel, 1/5 of 1c. per lb. (free) [¾c. per lb.]; horse, mule, or ox shoes, punched, drilled or tapped, of wrought iron or steel, for use with adjustable wrought-iron or steel skid calks, and solid drop-forged calked shoes of wrought iron or steel, 1c. per lb.

334. Steel wool, 10c. per lb. (20 per cent) [40 per cent]; steel shavings, 5c. per lb. (20 per cent) [40 per cent]; and in addition thereto, on all of the foregoing, 30 per cent ad valorem.

335. Grit, shot, and sand of iron or steel, in any form, ¾ of 1c. per lb. (30 per cent) [1c. per lb.]

336. Corset clasps, corset steels, and dress steels, whether plain or covered with cotton, silk, or other material, 35 per cent ad valorem. (15 per cent) [35 per cent]

337. Card clothing not actually and permanently fitted to and attached to carding machines or to parts thereof at the time of importation, when manufactured with round iron or untempered round steel wire, 20 per cent ad valorem; when manufactured with tempered round steel wire, or with plated wire, or other than round iron or steel wire, or with felt face, wool face, or rubber-face cloth containing wool, 45 per cent ad valorem. (all 10 to 35 per cent) [all 20 to 55c. per sq. ft.]

338. Screws, commonly called wood screws, of iron or steel, 25 per cent ad valorem. (25 per cent) [3 to 10c. per lb.]

339. Table, household, kitchen, and hospital utensils, and hollow or flat ware, not specially provided for; composed of iron or steel and enameled or glazed with vitreous glasses, 5c. per lb. and 30 per cent ad valorem [40 per cent]; composed wholly or in chief value of aluminum, 11c. per lb. and 55 per cent ad valorem (all above, 25 per cent); composed wholly or in chief value of copper, brass, steel, or other base metal, not specially provided for, 40 per cent ad valorem; and in addition thereto, upon any of the foregoing articles containing electrical heating elements as constituent parts thereof, 10 per cent ad valorem.

340. Crosscut saws, mill saws, pit and drag saws, circular saws, steel band saws, finished or further advanced than tempered and polished, hand, back, and all other saws, not specially provided for, 20 per cent ad valorem (12 per cent) [5c. per ft. to 5c. per lb. and 20 per cent extra]; jewelers' or piercing saws, 40c. per gross. [25 per cent]

341. Steel plates, stereotype plates, electrotype plates, halftone plates, photogravure plates, photo-engraved plates, and plates of other materials, engraved or otherwise prepared for printing, and plates of iron or steel engraved or fashioned for use in the production of designs, patterns, or impressions on glass in the process of manufacturing plate or other glass, 25 per cent ad valorem (15 per cent) [25 per cent]; lithographic plates of stone or other material engraved, drawn, or prepared, 25 per cent ad valorem. (25 per cent) [50 per cent]

342. Umbrella and parasol ribs and stretchers, composed wholly or in chief value of iron, steel, or other metal, in frames or otherwise, and tubes for umbrellas, wholly or partly finished, 50 per cent ad valorem. (35 per cent) [same]

343. Spring-beard needles, and other needles for knitting, sewing, shoe, or embroidery machines of every description, not specially provided for, and crochet needles, $1.15 per 1000 and 40 per cent ad valorem; latch needles, $2 per 1000 and 50 per cent ad valorem [above, $1 to $1.15 per 1000 and 25 to 35 per cent extra]; tape, knitting, and all other needles, not specially provided for, bodkins of metal, and needle cases or needle books furnished with assortments of needles or combinations of needles and other articles. [25 per cent] 45 per cent ad valorem. (all 20 per cent)

344. Fishhooks, fishing rods and reels, artificial flies, artificial baits, snelled hooks, leaders or casts, and all other fishing tackle and parts thereof, fly books, fly boxes, fishing baskets or creels, finished or unfinished, not specially provided for, except fishing lines, fishing nets, and seines, 45 per cent ad valorem (30 per cent); Provided, That any prohibition of the importation of feathers in this Act shall not be construed as applying to artificial flies used for fishing, or to feathers used for the manufacture of such flies.

345. Saddlery and harness hardware: Buckles, rings snaps, bits, swivels, and all other articles of iron, steel, brass, composition, or other metal, not plated with gold or silver, commonly or commercially known as harness hardware, 35 per cent ad valorem (15 per cent); all articles of iron, steel, brass, composition, or other metal, not plated with gold or silver, commonly or commercially known as saddlery or riding bridle hardware, 50 per cent ad valorem; all the foregoing, if plated with gold or silver, 60 per cent ad valorem.

346. Belt buckles, trouser buckles, and waistcoat buckles, shoe or slipper buckles, and parts thereof, made wholly or partly of iron, steel, or other base metal, valued at not more than 20c. per 100, 5c. per 100; valued at more than 20 and not more than 50c. per 100, 10c. per 100; valued at more than 50c. per 100, 15c. per 100; and in addition thereto, on all of the foregoing, 20 per cent ad valorem. (15 per cent)

347. Hooks and eyes, wholly or in chief value of metal, whether loose, carded, or otherwise, including weight of cards, cartons, and immediate wrappings and labels, 4½c. per lb. and 25 per cent ad valorem. (15 per cent)

348. Snap fasteners and clasps, and parts thereof, by whatever name known, or of whatever material composed, not plated with gold, silver, or platinum, and not mounted on tape, 55 per cent ad valorem; mounted on tape, including sew-on fasteners, 60 per cent ad valorem. (15 per cent)

349. Metal trouser buttons (except steel) and nickel bar buttons, 1/12 of 1c. per line per gross; steel trouser buttons, ¼ of 1c. per line per gross; buttons of metal, not specially provided for, ¾ of 1c. per line per gross; and in addition thereto, on all of the foregoing, 15 per cent ad valorem; metal buttons embossed with a design, device, pattern, or lettering, 45 per cent ad valorem: Provided, That the term "line" as used in this paragraph shall mean the line button measure of 1/40 in.

350. Pins with solid heads, without ornamentation, including hair, safety, hat, bonnet, and shawl pins; and brass, copper, iron, steel, or other base metal pins, with heads of glass, paste, or fusible enamel; all the foregoing not plated with gold or silver, and not commonly known as jewelry, 35 per cent ad valorem. (20 per cent) [35 per cent]

351. Pens, metallic, not specially provided for, 12c. per gross (8c.) [12c.]; with nib and barrel in one piece, 15c. per gross. (12c.) [15c.]

352. Penholder tips, penholders and parts thereof, [5c. per gross and 25 per cent] gold pens [25 per cent], combination penholders comprising penholders, pencil, rubber eraser, automatic stamp, or other attachments, 25c. per gross and 20 per cent ad valorem [45 per cent]; mechanical pencils made of base metal and not plated with gold, silver, or platinum, 45c. per gross and 20 per cent ad valorem (all 25 per cent): Provided, That pens and penholders shall be assessed for duty separately.

353. Fountain pens, fountain-pen holders, stylographic pens, and parts thereof, (25 per cent) [30 per cent] 72c. per doz. and 40 per cent ad valorem: Provided, That the value of cartons and fillers shall be included in the dutiable value.

354. Penknives, pocketknives, clasp knives, pruning knives, budding knives, erasers, manicure knives, and all knives by whatever name known, including such as are denominatively mentioned in this Act, which have folding or other than fixed blades or attachments, valued at not more than 40c. per doz., 1c. each and 50 per cent ad valorem; valued at more than 40 and not more than 50c. per doz., 5c. each and 50 per cent ad valorem; valued at more than 50c. and not more than $1.25 per doz., 11c. each and 55 per cent ad valorem; valued at more than $1.25 and not more than $3 per doz., 18c. each and 55 per cent ad valorem; valued at more than $3 and not more than $6 per doz., 25c. each and 50 per cent ad valorem; valued at more than $6 per doz., 35c. each and 55 per cent ad valorem; blades, handles, or other parts of any of the foregoing knives or erasers shall be dutiable at not less than the rate herein imposed upon knives and erasers valued at more than 50c. and not exceeding $1.25 per doz.; cuticle knives, corn knives, nail files, tweezers, hand forceps, and parts thereof, finished or unfinished, by whatever name known, 60 per cent ad

valorem (35 to 55 per cent) [40 per cent and up to 20c. each with 40 per cent extra]: Provided, That any of the foregoing, if imported in the condition of assembled, but not fully finished, shall be dutiable at not less than the rate of duty herein imposed upon fully finished articles of the same material and quality, but not less in any case than 15c. each and 55 per cent ad valorem: Provided further, That all the articles specified in this paragraph, when imported, shall have the name of the maker or purchaser and beneath the same the name of the country of origin die sunk conspicuously and indelibly on the shank or tang of at least one or, if practicable, each and every blade thereof.

355. Table, butchers', carving, cooks', hunting, kitchen, bread, cake, pie, slicing, cigar, butter, vegetable, fruit, cheese, canning, fish, carpenters' bench, curriers', drawing, farriers', fleshing, hay, sugar-beet, beet-topping, tanners', plumbers', painters', palette, artists', shoe, and similar knives, forks, and steels, and cleavers, all the foregoing, finished or unfinished, not specially provided for, with handles of mother-of-pearl, shell, ivory, deer, or other animal horn, silver, or other metal than aluminum, nickel silver, iron or steel, 16c. each; with handles of hard rubber, solid bone, celluloid, or any pyroxylin, casein, or similar material, 8c. each; with handles of any other material, if less than 4 in. in length, exclusive of handle, 2c. each; if 4 in. in length or over, exclusive of handle, 8c. each; and in addition thereto, on all of the foregoing, 45 per cent ad valorem (25 to 30 per cent) [not under 40 per cent]; any of the foregoing without handles, with blades less than 6 in. in length, 2c. each and 45 per cent ad valorem; with blades 6 in. or more in length, 8c. each and 45 per cent ad valorem: Provided, That all articles specified in this paragraph, when imported, shall have the name of the maker or purchaser and beneath the same the name of the country of origin die sunk legibly and indelibly upon the blade in a place that shall not be covered.

356. Planing-machine knives, tannery and leather knives, tobacco knives, paper and pulp mill knives, roll bars, bed plates, and all other stock-treating parts for pulp and paper machinery, shear blades, circular cloth cutters, circular cork cutters, circular cigarette cutters, meat-slicing cutters, and all other cutting knives and blades used in power or hand machines, 20 per cent ad valorem.

357. Nail, barbers', and animal clippers, pruning and sheep shears, and all scissors and other shears, and blades for the same, finished or unfinished, valued at not more than 50c. per dozen, 3½c. each and 45 per cent ad valorem; valued at more than 50c. and not more than $1.75 per doz., 15c. each and 45 per cent ad valorem; valued at more than $1.75 per doz., 20c. each and 45 per cent ad valorem [15c. per doz. and 15 per cent to 75c. per doz. and 25 per cent] (all above, 30 per cent); Provided, That all articles specified in this paragraph, when imported, shall have die sunk conspicuously and indelibly, the name of the maker or purchaser and beneath the same the name of the country of origin, to be placed on the outside of the blade, between the screw or rivet and the handle of scissors and shears (except pruning and sheep shears), and on the blade or handle of pruning and sheep shears and clippers.

358. Safety razors, and safety razor handles and frames, 10c. each and 30 per cent ad valorem; razors and parts thereof, finished or unfinished, valued at less than 75c. per doz., 18c. each; valued at 75c. and less than $1.50 per doz., 25c. each; valued at $1.50 and less than $3 per doz., 30c. each; valued at $3 and less than $4 per doz., (35 to 55 per cent) [35 per cent up to 15c. each and 35 per cent] 35c. each; valued at $4 or more per doz., 45c. each; and in addition thereto, on all of the foregoing, 45 per cent ad valorem: Provided, That finished or unfinished blades for safety razors shall pay a duty of 1c. each and 30 per cent ad valorem: Provided further, That all articles specified in this paragraph, when imported, shall have the name of the maker or purchaser and beneath the same the name of the country of origin die sunk conspicuously and indelibly on the blade or shank or tang of each and every blade and on safety razors and parts thereof.

359. Surgical instruments, and parts thereof, composed wholly or in part of iron, steel, copper, brass, nickel, aluminum, or other metal, finished or unfinished, 45 per cent ad valorem; dental instruments, and parts thereof, composed wholly or in part of iron, steel, copper, brass, nickel, aluminum, or other metal, finished or unfinished, 35 per cent ad valorem (20 per cent) [45 per cent]: Provided, That all articles specified in this paragraph, when imported, shall have the name of the maker or purchaser and beneath the same the name of the country of origin die sunk conspicuously and indelibly on the outside, or if a jointed instrument on the outside when closed.

360. Philosophical, scientific, and laboratory instruments, apparatus, utensils, appliances (including drawing, surveying, and mathematical instruments), and parts thereof, composed wholly or in chief value of metal, and not plated with gold, silver, or platinum, finished or unfinished, not specially provided for, 40 per cent ad valorem (20 per cent) [45 per cent]: Provided, That all articles specified in this paragraph, when imported, shall have the name of the maker or purchaser and beneath the same the name of the country of origin die sunk conspicuously and indelibly on the outside, or if a jointed instrument on the outside when closed.

361. Pliers, pincers, and nippers of all kinds, finished or unfinished, 60 per cent ad valorem (30 per cent) [8c. per lb. and 40 per cent]; Provided, That all articles specified in this paragraph, when imported, shall have the name of the maker or purchaser and beneath the same the name of the country of origin die sunk conspicuously and indelibly on the outside of the joint.

362. Files, file blanks, rasps, and floats, of whatever cut or kind, 2½ in. in length and under, 25c. per doz.; over 2½ and not over 4½ in. in length, 47½c. per doz.; over 4½ and under 7 in. in length, 62½c. per doz.; 7 in. in length and over, 77½c. per doz.

363. Sword blades, and swords and side arms, irrespective of quality or use, wholly or in part of metal, 50 per cent ad valorem. (30 per cent) [50 per cent]

364. Muzzle-loading muskets, shotguns, rifles, and parts thereof, 25 per cent ad valorem. (15 per cent) [25 per cent]

365. Double or single barreled breech-loading and repeating shotguns, rifles, and combination shotguns and rifles, valued at not more than $5 each, $1.50 each; valued at more than $5 and not more than $10 each, $4 each; valued at more than $10 and not more than $25 each, $6 each; valued at more than $25 each, $10 each; and in addition thereto, on all of the foregoing, 45 per cent ad valorem; barrels for breech-loading and repeating shotguns and rifles, further advanced in manufacture than rough bored only, $4 each; stocks for breech-loading shotguns and rifles, wholly or partly manufactured, $5 each; and in addition thereto, on all of the foregoing, 50 per cent ad valorem (35 per cent) [75c. each and 25 per cent extra to $6 each and 35 per cent extra]; on all parts of such guns or rifles, and fittings for such stocks or barrels, finished or unfinished, 55 per cent ad valorem (35 per cent): Provided, That all breech-loading shotguns and rifles imported without a lock or locks or other fittings shall be subject to a duty of $10 each and 55 per cent ad valorem.

366. Pistols: Automatic, magazine, or revolving, and parts thereof and fittings therefor, valued at not more than $4 each, $1.25 each; valued at more than $4 and not more than $8 each, $2.50 each; valued at more than $8 each, $3.50 each; and in addition thereto, on all of the foregoing, 55 per cent ad valorem.

367. Watch movements, whether imported in cases or otherwise, assembled or knocked down, if having less than seven jewels, 75c. each [70c.]; having seven and not more than 11 jewels, $1.25 each [$1.35]; having more than 11 and not more than 15 jewels, $2 each [$1.85]; having more than 15 and not more than 17 jewels, unadjusted, $2.75 each [$1.25 and 25 per cent]; having 17 jewels and adjusted to temperature, $3.50 each; having 17 jewels and adjusted to three positions, $4.75 each; having 17 jewels and adjusted to five positions, $6.50 each; having more than 17 jewels, adjusted or unadjusted, $10.75 each (all above, 30 per cent); watchcases and parts of watches, chronometers, box or ship, and parts thereof, 45 per cent ad valorem (30 per cent) [40 per cent]; all jewels for use in the manufacture of watches, clocks, meters, or compasses, 10 per cent ad valorem (10 per cent); enameled dials for watches or other instruments, 3c. per dial and 45 per cent ad valorem: Provided, That all watch and clock dials, whether attached to movements or not, when imported shall have indelibly painted or printed thereon the name of the country of origin, and that all watch movements and plates, assembled or knocked down, and cases shall have the name of the manufacturer or purchaser and the country of manufacture cut, engraved, or die sunk conspicuously and indelibly on the plate of the movement and the inside of the case, respectively, and the movement and plates shall also have marked thereon by one of the methods indicated the number of jewels and adjustments, said numbers to be expressed both in words and in Arabic numerals, and if the movement is not adjusted, the word "unadjusted" shall be marked thereon by one of the methods indicated, and none of the aforesaid articles shall be delivered to the importer unless marked in exact conformity to this direction: Provided further, That only the number of the jewels which serve a mechanical purpose as frictional bearings shall be marked as herein provided.

368. Clocks and clock movements, including lever clock movements, and clockwork mechanisms, cased or uncased, whether imported complete or in parts, and any device or mechanism having an essential operating feature intended for measuring time, distance, or fares, or the flowage of water, gas, electricity, or similar uses, or for regulating or controlling the speed of arbors, drums, disks, or similar uses, or for recording, indicating, or performing any operation or function at a predetermined time or times, any of the

foregoing whether wholly or partly complete or knocked down (in which condition they shall be appraised at the valuation of the complete article); cases and casings for clockwork mechanisms imported separately; all the foregoing, 45 per cent ad valorem (30 per cent) [40 per cent]; and in addition thereto, upon any of the foregoing articles or parts thereof, having jewels, but not more than two jewels, in the escapement, $1 each; having more than two but not more than four jewels, $2 each; having more than four jewels, $4 each; if without jewels in the escapement and valued at not over $1.10 each, 35c. each; valued at more than $1.10 and not more than $2.25 each, 70c. each; valued at more than $2.25 but not more than $5 each, $1 each; valued at more than $5 but not more than $10 each, $2 each; valued at more than $10 each, $3 each; all parts and materials for use in any of the foregoing if imported separately, and not specially provided for, 50 per cent ad valorem: Provided, That all dials, whether attached to movements or not, when imported, shall have indelibly painted, printed, or stamped thereon the name of the country of origin, and the front or back plate of the movement frame of any of the foregoing when imported shall have the name of the maker or purchaser, the name of the country where manufactured, and the number of jewels, if any, indelibly stamped on the most visible part of same; but if such markings are in whole or in part sufficiently similar to the trade name or trade-mark of an established American manufacturer as to be liable to deceive the user in the United States, entry thereof shall be denied if such trade name or trade-mark has been placed on file with the collector of customs.

369. Automobiles, automobile bodies, automobile chassis, motor cycles, and parts of the foregoing, not including tires, all of the foregoing whether finished or unfinished, 25 per cent ad valorem (30 per cent under $2,000; above $2,000, 45 per cent; parts, 30 per cent): Provided, That if any country, dependency, province, or other subdivision of government imposes a duty on any article specified in this paragraph, when imported from the United States, in excess of the duty herein provided, there shall be imposed upon such article, when imported either directly or indirectly from such country, dependency, province, or other subdivision of government, a duty equal to that imposed by such country, dependency, province, or other subdivision of government on such article imported from the United States, but in no case shall such duty exceed 50 per cent ad valorem.

370. Airplanes, hydroplanes, motor boats, and parts of the foregoing, 30 per cent ad valorem.

371. Bicycles and parts thereof, not including tires, 30 per cent ad valorem (25 per cent) [45 per cent]: Provided, That if any country, dependency, province, or other subdivision of government imposes a duty on any article specified in this paragraph, when imported from the United States, in excess of the duty herein provided, there shall be imposed upon such article, when imported either directly or indirectly from such country, dependency, province, or other subdivision of government, a duty equal to that imposed by such country, dependency, province, or other subdivision of government on such article imported from the United States, but in no case shall such duty exceed 50 per cent ad valorem.

372. Steam engines (15 per cent) [30 per cent] and steam locomotives, 15 per cent ad valorem (15 per cent) [45 per cent]; sewing machines (free) [30 per cent] and parts thereof, not specially provided for, valued at not more than $75 each, 15 per cent ad valorem; valued at more than $75 each, 30 per cent ad valorem; cash registers, (free) [30 per cent] and parts thereof, 25 per cent ad valorem; printing presses (15 per cent) [30 per cent], not specially provided for, lawn mowers (free) [45 per cent], and machine tools and parts of machine tools, 30 per cent ad valorem (15 per cent) [30 per cent]; embroidery machines, including shuttles for sewing and embroidery machines, lace-making machines, machines for making lace curtains, nets and nettings, 30 per cent ad valorem (25 per cent) [45 per cent]; knitting, braiding, lace braiding, and insulating machines, and all other similar textile machinery or parts thereof, finished or unfinished, not specially provided for, 40 per cent ad valorem; all other textile machinery or parts thereof, finished or unfinished, not specially provided for, 35 per cent ad valorem; cream separators valued at more than $50 each, (free) [45 per cent on value not exceeding $75] and other centrifugal machines for the separation of liquids or liquids and solids, not specially provided for, 25 per cent ad valorem; combined adding and typewriting machines, 30 per cent ad valorem; all other machines or parts thereof, finished or unfinished, not specially provided for, 30 per cent ad valorem: Provided, That machine tools as used in this paragraph shall be held to mean any machine operating other than by hand power which employs a tool for work on metal.

373. Shovels, spades, scoops, scythes, sickles, grass hooks, corn knives, and drainage tools, and parts thereof, composed wholly or in chief value of iron, steel, lead, copper, brass, nickel, aluminum, or other metal, whether partly or wholly manufactured, 30 per cent ad valorem. (20 per cent) [45 per cent]

374. Aluminum, aluminum scrap, and alloys of any kind in which aluminum is the component material of chief value, in crude form, 5c. per lb. (2c.) [7c.]; in coils, plates, sheets, bars, rods, circles, disks, blanks, strips, rectangles, and squares, 9c. per lb. (3½c.) [11c.]

375. Metallic magnesium and metallic magnesium scrap, 40c. per lb.; magnesium alloys, powder, sheets, ribbons, tubing, wire, and all other articles, wares, or manufactures of magnesium, not specially provided for, 40c. per lb. on the metallic magnesium content and 20 per cent ad valorem. (10 per cent) [20 per cent]

376. Antimony, as regulus or metal, 2c. per lb.; needle or liquated antimony, ¼ of 1c. per lb. (10 per cent) [1½c. per lb.]

380. German silver, or nickel silver, unmanufactured, 20 per cent ad valorem (15 per cent) [25 per cent]; nickel silver sheets, strips, rods, and wire, 30 per cent ad valorem.

381. Copper in rolls, rods, or sheets, 2½c. per lb. (5 per cent) [2½c. per lb.]; copper engravers' plates, not ground, and seamless copper tubes and tubing, 7c. per lb.; copper engravers' plates, ground, and brazed copper tubes, 11c. per lb.; brass rods, sheet brass, brass plates, bars, and strips, Muntz or yellow metal sheets, sheathing, bolts, piston rods, and shafting, 4c. per lb.; seamless brass tubes and tubing, 8c. per lb.; brazed brass tubes, brass angles and channels, 12c. per lb.; bronze rods and sheets, 4c. per lb.; bronze tubes, 8c. per lb. (20 per cent) [45 per cent]

382. Aluminum or tin foil less than 6/1000 in. in thickness, 35 per cent ad valorem; bronze powder, 14c. per lb. (25 per cent) [12c. per lb.]; aluminum powder, powdered foil, powdered tin, brocades, flitters, and metallics, manufactured in whole or in part, 12c. per lb.; bronze, or Dutch metal, or aluminum, in leaf, 6c. per 100 leaves (25 per cent) [6c. per 100 leaves]. The foregoing rate applies to leaf not exceeding in size the equivalent of 5½ x 5½ in.; additional duties in the same proportion shall be assessed on leaf exceeding in size said equivalent.

383. Gold leaf, 55c. per 100 leaves. The foregoing rate applies to leaf not exceeding in size the equivalent of 3⅜ x 3⅜ in.; additional duties in the same proportion shall be assessed on leaf exceeding in size said equivalent. (35 per cent) [35c. per 100 leaves upward]

384. Silver leaf, 5c. per 100 leaves. (30 per cent) [10c. per 100 leaves] Tinsel wire, made wholly or in chief value of gold, silver or other metal, 6c. per lb. and 10 per cent ad valorem (6 per cent) [5c. per lb.]; lame or lahn, made wholly or in chief value of gold, silver, or other metals, 6c. per lb. and 20 per cent ad valorem (6 per cent) [5c. per lb.]; bullions and metal threads made wholly or in chief value of tinsel wire, lame or lahn, 6c. per lb. and 35 per cent ad valorem (25 per cent) [5c. per lb. and 30 per cent]; beltings, toys, and other articles made wholly or in chief value of tinsel wire, metal thread, lame or lahn, or of tinsel wire, lame or lahn and india rubber, bullions, or metal threads, not specially provided for, 45 per cent ad valorem (40 per cent) [15c. per lb. and 60 per cent]; woven fabrics, ribbons, fringes, and tassels, made wholly or in chief value of any of the foregoing, 55 per cent ad valorem. (40 per cent) [15c. per lb. and 60 per cent]

386. Quicksilver, 25c. per lb. (10 per cent) [7c. per lb.]; Provided, That the flasks, bottles, or other vessels in which quicksilver is imported shall be subject to the same rate of duty as they would be subjected to if imported empty.

389. New types, 20 per cent ad valorem. (15 per cent) [1½c. per lb. on the lead contained therein]

390. Nickel oxide, 1c. per lb.; nickel, and nickel alloy of any kind in which nickel is the component material of chief value, in pigs, or ingots, shot, cubes, grains, cathodes, or similar forms, 3c. per lb. [6c. per lb.]; in bars, rods, plates, sheets, strips, strands, castings, wire, tubes, tubing, anodes, or electrodes, 25 per cent ad valorem (sheets or strips 20 per cent, all other 10 per cent) [sheets or strips, bars, rods, plates, 35 per cent]; and in addition thereto, on all of the foregoing, if cold rolled, cold drawn, or cold worked, 10 per cent ad valorem.

391. Bottle caps of metal, collapsible tubes, and sprinkler tops, if not decorated, colored, waxed, lacquered, enameled, lithographed, electroplated, or embossed in color, 30 per cent ad valorem (30 per cent) [½c. per lb.]; if decorated, colored, waxed, lacquered, enameled, lithographed, electroplated, or embossed in color, 45 per cent ad valorem. (40 per cent)

392. Lead-bearing ores and mattes of all kinds, 1½c. per lb. on the lead contained therein (¾c. per lb.) [1½c. per lb.]: Provided, That such duty shall not be applied to the lead contained in copper mattes unless actually recovered. [Here follows the usual administration provision—Editor]

393. Lead bullion or base bullion, lead in pigs and bars

(*Continued on page* 765)

Features of Modern Blast Furnace Practice

American and British Methods and Design Discussed by the Iron and Steel Institute—Variant Opinions on High-Speed Steel —Recent Molding Sand Investigations

(Special Correspondence)

LONDON, ENGLAND, Sept. 9.—The autumn meeting of the Iron and Steel Institute was held in the ancient city of York on Sept. 5 and 6, and was largely attended. Although York has lost the prominence it once enjoyed as an industrial and trade center, it has of recent years attracted some important manufacturing industries, and, as the headquarters of the North Eastern Railway Co., it remains one of the most vital centers in the network of British railroads. But it is as the capital of the county which is virtually the home of the Iron and Steel Institute that the city was an appropriate meeting place. The president of the institute, Francis Samuelson, who occupied the chair on both days, is a Yorkshireman. The treasurer is of Yorkshire by virtue of long residence, and the list of past presidents contains the names of many Yorkshiremen, including that of Sir Hugh Bell.

The meeting opened with a civic welcome. In acknowledging it the president took the opportunity of pointing out that the bulk of members of the institute are directly engaged in the production of iron and steel and that only a small minority are connected with the scientific side. The president's reminder was timely, for the papers usually presented before the meetings show a greater tendency to discuss purely technical problems than those of a practical character. Thus it is often the case that more interest is taken in informal conversations in the lobbies than in the proceedings in the lecture hall.

Routine business is invariably deferred to the annual spring meetings held in London, and the only business of this nature taken at York was a proposal by the council to alter the method of procedure in the election of a president. This means that a president will be elected for one year, but if it is desired to reelect the hands of the institute will not be tied.

Modern Blast Furnace Practice

The first paper considered was by A. K. Reese, Cardiff, who described the bases upon which modern blast furnace practice has been built up, and showed how their wider adoption would lead to a very desirable improvement in pig iron production as regards output and economy, in localities where the older practice is still in vogue. In discussing the preparation of the raw materials, Mr. Reese advised the use of uniform size of coke lumps, not exceeding 4 to 6 in., and screened to remove smalls. The crushing of ore to 3 and 4 in. sizes was advocated. The author has long been a user of "dry blast" and believes it has distinct advantages, chief among them the saving secured from being able to employ high temperatures without the usual trouble of sticking. As regards design, Mr. Reese contended that the output capacity of the furnace is in proportion to the effective bosh area. The low bosh is the outcome of attempts to increase outputs by increasing the volume of blast per minute. He enumerated the various advantages of the machine method of handling molten pig iron over the sand-casting method Mr. Reese characterized the object of modern blast-furnace practice as the attainment of the greatest possible quantity consistent with quality.

[A synopsis of the paper will appear in a later issue.—EDITOR.]

Discussion

PROF. HENRY LOUIS, Newcastle, controverted the author's statement that James Gayley was first to introduce and demonstrate dry blast, in 1904. He believed that the honor of first seeing and using the dry blast method belonged to England and not to the United States; and in support of his contention he referred to Charles Cochrane's experiments 30 or 40 years back. He (the speaker) characterized as an American idea the author's description of his object as the attainment of the greatest possible quantity consistent with quality, and he urged as an alternative object to be aimed at the greatest possible economy consistent with quantity, for economy and quantity were by no means identical. Mr. Reese advocated the huge blast furnace of 600 tons per day and if he had to produce 1800 tons per day he would put in three blast furnaces. He (Prof. Louis) was inclined to think that it would be far better to put up six blast furnaces, producing half the quantity each. As far as his recollection went the greatest economy, at any rate in fuel consumption, which nowadays was very important, had been attained in furnaces of relatively moderate size. Six blast furnaces would be more expensive plant than three larger ones, but in the manufacture of pig iron the item of interest and depreciation of capital does not bear any very important ratio to the total, and economy in fuel is probably the most important thing to aim at.

GUY BARRETT, Wigan, suggested that small coke was detrimental for more reasons than its size; it very often contained a large proportion of moisture and of ash. Discussing the grading of ores, he was in favor of requiring greater uniformity. With regard to the question of dry blast, he had been informed in the United States that it had been given up and he said that probably no other conclusion could be reached than that the modern practice had not been altogether a great success financially. Speaking of design, he had found that the low bosh gave the best results.

F. CLEMENTS, Parkgate, said he had listened to the paper with just a tinge of disappointment, not because he disagreed with any of the bases laid down by Mr. Reese, but because he was left rather in the dark as to how far those bases were supported by Mr. Reese's own experience. There were three points in the paper which he wished to traverse. Th first was relative to the breaking of ironstone. He was in agreement with Mr. Reese as to the logical argument on that point, but it was rather different when they came to consider it from a practical point of view. For instance, at the Staveley and Parkgate works where the amount of ore handled was over 2000 tons per day, containing only 28 per cent of iron, 1s. per ton was added to the cost of ore in handling it. This meant 3s. per ton on the pig iron that was produced. He doubted whether it was really worth while breaking the ore although it was strictly logical. The paper gave eight specific advantages of gas cleaning, and he would ask Mr. Reese how far in his experience the technical results justified the installation of gas cleaners at considerable expense. They were limited in the choice of gas cleaners, and he thought the right type had still to be evolved. He agreed that it was the effective area of the bosh that governed the output of the blast furnace. American practice showed that this law held good in that country as in the home practice.

E. C. EVANS took issue with the author's statement that the reaction of carbon dioxide upon a porous fuel in the blast furnace is wasteful; far from being detrimental he considered it as of the greatest benefit to the blast furnace man. He believed that the use of such a coke will result in a considerable diminution of temperature at the top of the furnace; it will lower the swing of reaction in the furnace. He considered

that the main factor is not so much the porosity of the material as the character of the pores, and the foresaw a radical change in the economic production of pig iron by the use of a fuel with the burning qualities of charcoal.

W. J. FOSTER was of opinion that much of the coke was not dense enough; what is required is a dense coke to correspond with the beehive coke in the matter of hardness. In grading materials he would give preference to the size of the coke and limestone rather than the ironstone, as the latter melted above the bosh line. In 1907 he discussed Mr. Gayley's paper and later discussed the subject with him in America and he (the speaker) thought that what he had discovered in respect to effective calories in those days in the use of the dry blast was very nearly what they found in practice today.

J. H. HARRISON, Middlesbrough, emphasized the importance of the right distribution of materials in the furnaces. His view was that the diameter of the bell should be half the diameter of the throat, and they found in Cleveland that the best results had been obtained in furnaces of this type.

H. K. SCOTT urged that a great responsibility rested upon the owners in the matter of putting in proper equipment for the working of blast furnaces.

C. H. RIDSDALE considered that every blast furnace manager should be able to understand and work out heat balance sheets, otherwise he could not expect to get the best results.

MR. REESE, replying to the discussion, took up first the comments of Professor Louis. The latter had not agreed that the greatest output consistent with quality was the object of modern blast furnace practice, and his idea was that they could not get a low fuel consumption or fuel economy with large outputs of pig iron. The speaker suggested that if Professor Louis would consult some of the results obtained in later years in the United States with furnaces making 700 tons a day he would find that the fuel consumption ran as low as, if not a good deal lower than, anything done in this country under the old practice. Within the last three months details had been published of the results from a modern blast furnace, one of the most recently built in the United States in which the fuel consumption was very low, something like 16 or 16½ cwt. per ton, with outputs of 700 and 800 tons a day for a short period. That compared favorably with anything that could be done or had been done in the slow driven old type of furnace. Professor Louis spoke of enormous furnaces, but the speaker wanted to point out that the furnaces in which these practices were carried out were not enormous. They reached 85 to 90 ft. in height, and there were many furnaces under the old practice that were 85 feet in height and a few were built of 100 to 105 ft. That practice had died out and 85 to 90 ft. was the standard size for modern blast furnaces. So there was nothing very enormous about them. The internal volume of the furnaces was a good deal smaller than that of the old furnace of 80 to 85 ft. under the old practice. They were now much smaller in their diameter. He had no doubt that large output had a very decided effect on economical output, because it divided cost of fixed charges, reduced labor costs and everything but the cost of raw material and fuel. Under the new practice the fuel consumption was unquestionably much lower in proportion. It was as low as it was under the old practice and had all the other advantages of the high output from a single furnace. With regard to the size of the ore, the usual practice was to break it down to 3 in. long, the degree depending somewhat on the characteristics of the ore. A very dense ore could be usefully broken down to 2 in. In his opinion and experience an ore ½ in. in size was not a fine ore, and even ¼-in. ore would work well in a blast furnace. It was the fine dusty material that caused the difficulty. Mr. Barrett had asked some questions about the crushed ore being placed in the rotary. In northern New York State it was done as a regular thing and the ore was roasted. His answer to Mr. Clements on the point of crushing ore was that he did not know what he got out of his furnace. It would pay him a good deal more than 3s. a ton when he put ore that size into his furnace if he was going to adopt modern practice. Mr. Evans had put forward a question by which he suggested the possibility of a very radical change in the economic production of pig iron. It was so radical and his claim was so enormous that it was beyond the present discussion, but he suggested to Mr. Evans that the proper thing for him to do, having confidence in his convictions was to produce a sufficient quantity of his "charcoke" (as he would term the new material) to test it properly in a blast furnace. He would recommend that Mr. Evans should do that in a blast furnace operated under modern conditions and not in one of the older type. There had been several references to his statement that it took approximately a quarter of the weight of coke to simply take care of the slag. Apparently the gentlemen had misunderstood. They seemed to have an idea that a fourth of the coke in the furnace was required to take care of the slag. But his statement was that 25 per cent of the weight of slag produced was required in coke. How much coke was required depended on how much slag there was.

Molding Sands

C. H. W. Holmes presented a paper describing his investigations with a view to estimating quantitatively the effect produced upon the essential properties of sand by the various processess to which molding sands are subjected. A large increase both in bond value and in mechanical strength occurs after milling and disintegration of the sands. The author concluded that the mechanical and physical properties of sands for gray iron founding are equally important with chemical analysis; that the bond absorption value obtained in the raw sand may be greatly modified by mechanical treatment, and that the most successful molding sands contain both static and mobile bond.

Discussion

Several speakers suggested that too little investigation of foundry sands had been conducted in Great Britain and that in particular the difficulty of mixing sands had not received sufficient attention.

J. E. FLETCHER directed attention to the difficulties in mixing sands. When once sand had been deposited under watery conditions, and the wet sediment dried off, and an attempt was made to mix those constituents, a very difficult proposition presented itself. In many cases the use of water in mixing is responsible for a great many of the molder's troubles. The use of the die was undoubtedly a qualitative sort of test, but to him it did not yet seem quite satisfactory, as in some cases the absorption tests had not quite borne out the hope that had been formed of them. He asked whether the author had tried the circular transverse test as against the square one.

DR. W. H. HATFIELD considered that what was of more interest to the iron and steel industry than the various physical and mechanical properties of sands was that there should be devised simple, ready and effective methods of determining the suitability of a given sand for the manufacture of steel castings or cast iron. After all, the actual casting operation was an empirical test and the only test which hitherto was able to demonstrate successfully for them the real merit of a sand. Some years ago, he noticed in the Pas de Calais a foundry working actually on the sand dug up in the next field. That sand was simply carted into the works, milled, and then used as a green sand in the making of excellent steel castings. The various methods of investigating sands were incomplete until there were some quantitative forms of test which could show without the casting operation the suitability of a sand.

ISAAC LESTER said that the only good test of a casting was the casting itself and what it did. The same applied to molding sand—if a sand was good enough for a certain casting, let them keep on using it; if it was not, then it should be discarded in favor of some other.

H. SCOTT asked the author whether he was working in conjunction with investigators in the United States and whether he had synchronized his method of

investigation with the methods in vogue across the Atlantic. He uttered a warning that before carrying on this investigation, some effort should be made to discover whether people who were working on similar lines were in fact working with similar materials and similar dimensions.

MR. HOLMES in reply said that the average foundry was very badly equipped as regards sand preparing machinery, and he predicted that sand preparation would be revolutionized to a great extent in the next few years. He hoped some day to devise the simple methods advocated by Dr. Hatfield but he was afraid that day was a long way off. In regard to the suggestion on standardization, as far as possible he had adopted the methods used by American workers. The transverse bar as he had taken it in his experiment was used by Hanley and Simmons, who were, he would say, among the leading workers in America. The reduction of bond by coal dust and the possibility of getting a variety of coal dust that would be successful in use and would reduce the bond as little as possible opened up a big field of its own. Detailed work on sand at the present time was so very wide and one had so little help in the meagre work which had gone before that the position was rather appalling. If they cast an article in a sand that had a good deal of coal dust in it they could see just above the surface of the metal, the gas actually coming off.

High-Speed Steel Work

H. K. OGILVIE, Coventry, described the practical details of the manufacture of high speed steel in the basic-lined electric furnace. The advantages of this method over the crucible were detailed and the refining action of the electric furnace method commended. The charge used generally consists of high-speed steel scrap, with a small amount of turnings. Heavy clean scrap with high tungsten content was most economically used, and light or rusty castings rejected. Ten per cent of loss occurred in melting, which might rise to 20 per cent with more turnings. Good steel could be made in a 3 or 4-ton furnace in about 4½ hours from starting. The use of ferrosilicon was found to obviate the tendency of the steel to rise in the molds when cast. The file and Brinell hardness tests were not considered satisfactory, as rapid means for testing the cutting hardness of hardened high-speed steel. Both may serve to separate material within fairly wide limits, but cases are numerous where one method of testing gave quite different impressions from another. Scratch and rebound hardness tests do not give consistent results and even magnetic and electrical tests have not succeeded in solving the problem of a good rapid test for this steel.

Discussion

C. G. CARLISLE, Sheffield, thought the author made rather an illogical statement when he said that steels properly made by the crucible and the electric method seemed to be equally good. Then Mr. Ogilvie proceeded to say that it sometimes happened in the crucible steel process that small particles of tungsten powder have not been completely melted. Obviously if it was not melted in the crucible, the two processes were not equal, and seeing that the electric furnace was capable of melting tungsten powder the electric furnace must be the better. Mr. Ogilvie rather fell into the error of a specified time limit for his charges. He said, "In any case the time should not exceed 4½ hr. for a 3 or 4-ton furnace." It was rather a tall order to say "in any case" in connection with an electric furnace. Many things might happen and did happen, which stopped any calculation as to what time they were going to get the heat out. It was all right to discuss the time limit when they had got the heat out, but previous to that it was best to leave that alone. Members who had the commercial intinct to the fore rather than the technical instinct preferred to talk about time limits. The metallurgical problem that Mr. Ogilvie set for himself there, and which he did not solve, was the gas trouble he mentioned. There was no electric furnaceman who had not passed through that stage and been exasperated by it. Mr. Ogilvie said there was gas trouble and then proceeded to say that the slag was all right. He (Mr. Carlisle) contended that the slag was not perfectly all right when there was gas trouble. First of all was there overoxidation of the bath? The furnace firer might be contending with some carbon difficulty. He wanted to reduce the carbon in the bath and by an oversight he had too much oxygen in the form of oxide of iron which was not pulled out and was left there at the time he raked his slag off, persisting throughout the subsequent refining. Then another and obvious error crept in, and that was in the refining slag when he did not obtain sufficient fusibility of his slag at an early stage. The consequence of that was that they got the electric arc to play on the slag. If they had got the slag too limey and with not sufficient fusibility about it they had the direct arc playing on the bare metal, and they got the lumpy slag without any coating of thin slag to protect it. In consequence they might get overheated metal and fiery metal and one that gave trouble in the molds. His method of cooling was one that he (Mr. Carlisle) had had to adopt on occasions and which was almost always successful. He could not understand re-action except that it must throw out oxide in solution. He was rather surprised to find that Mr. Ogilvie did not anneal his billets after forging and before he ground them. In Sheffield a good deal of high-speed steel was spoiled during the war through being in too much of a hurry, and through grinding billets that were not annealed. If they began to grind a small crack without hardening the billet, they simply made it worse. If it was in somewhat hardened condition they made it rather better by grinding. Mr. Ogilvie forgot to anneal or temper his machined tools before hardening. He remembered a machine tool firm which was very persistent but finally yielded to advice and found that they were much more successful than hitherto in obtaining good tools without any danger of cracking through annealing or tempering before finally hardening.

H. BREARLEY, Sheffield, thought the economic basis of the process described by Mr. Ogilvie, was not quite clear. Some of the conclusions seemed to him extremely doubtful. Mr. Ogilvie referred, for example, to the cost of billets per ton, but whether he melted the metal in an electric furnace or in the crucible was not clear. As he did not tell the kind of crucible furnace he was comparing with the electric furnace, obviously his comparison was not of very much value. In Sheffield, at any rate, in pre-war days, the cost of sound bars, things like tool steel, high speed steel and so on was pretty much the same whether the material was melted in a gas-fire crucible furnace or an electric furnace. Of course if the author were making comparisons with coke he dared say they would be in favor of the electric furnace. It was considered, or used to be in Sheffield, that the only way to put tungsten into high speed steel or any other kind of tungsten steel was in the form of tungsten powder. He was very glad to see that a comparatively young man in Coventry had risen to tell them that it was a wrong thing to do and that they should use ferrotungsten. He was inclined to agree with Coventry on that. He did not understand the author when he said that "To attempt to make good high speed steel from turnings alone, or where the greater part of the charge consists of turnings, is not in this country commercially possible." He did not understand why it should not be possible in this country if it was possible anywhere else. It was explained further on in the text that one of the difficulties was that some of the turnings were greasy and would probably carbonize and that some of them were rusty and would probably oxidize the melt. He could not understand why it was not possible to mix part of the rusty turnings with part of the greasy turnings and so ease things up. There was one other thing in Mr. Ogilvie's paper that was extremely interesting. He told them about a low tungsten chromium steel which, although it had a Brinell hardness of 650, was easily filed. In the same tungsten chromium steels in which the Brinell number

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Commercial Conditions Not Bad

The average observer feels that there is much in present commercial and industrial conditions to be regretted. On the basis of pre-war standards and viewpoints the feeling is justified, but from the broader and newer viewpoint we plainly see that the clouds have silver linings.

The steel industry feels that it has reason to complain of its rising costs and inability to operate at an efficient rate, but if the industry were miraculously put in the position of being able to operate at its full capacity it would probably find itself faced with very unsatisfactory market prices. The industry is almost bewildered by the succession of "troubles" it has had. Before the war it was practically always able to operate at capacity when it had a sufficient order book, but this exception was an important one, and for quite a while prior to the war the periods of relative inactivity were tending to lengthen, at the expense of the periods of great activity.

Relations between employers and employees are considered as being on the whole unsatisfactory, but they were also unsatisfactory before the war. The most important difference is that before the war there was no very rapid trend toward improvement, while in this post-war period improvement is being forced. At some points there seems to be a trend in the wrong direction, but in such cases a righting will necessarily be forced. It is better to bring things to an issue.

The coal situation is not wholly objectionable. Circumstances that have made the present situation were in existence before the war and presumably would have made trouble sooner or later had there been no war. It is inconceivable that a satisfactory solution will not be worked out in time. The solution may perchance be one that will run counter to the wishes of many men, as to the part the Government should play in industry and commerce, but all experience shows that when men are forced to change their opinions they prove more adaptable than had been imagined.

The episode of the railroad shopmen's strike now appears after all to prove rather a vindication of the Transportation Act than an accident requiring a reopening of the whole subject. Certainly the act has not scored a failure. It may not be working altogether so well as expected, but it has a vastly more difficult labor situation to meet than any that existed before the war.

Dissatisfaction that the Government has not been more helpful to business since the Armistice should be tempered by reflection that business has shown its resourcefulness by getting along without such help. It is easy to recall the amount of talk there was just before the Armistice that a reconstruction program was absolutely necessary, and it is very pleasant to reflect how much trouble we have escaped by failing to try to impose any program upon business. While the legislative department of the Government has done little constructive work, the Treasury Department has done remarkably well, so well that few men have bothered themselves noticing that fiscal problems of very serious importance have been smoothly and perfectly solved. The advantage that American business enjoys by the Government's finances being in such excellent condition is incalculable.

German Steel Industry To-Day

New light on the present capacity of the German steel industry is given by statistics recently made public and published in THE IRON AGE last week. While only total pig iron and steel production for 1920 and 1921 are set down, with no details, it is the first information that has come out of Germany regarding these two years.

Steel output is returned as 725,000 gross tons per month for 1921, as compared with 1,445,000 tons per month in 1913. Assuming that Germany lost about one-third of its steel-making capacity as a result of the war, then the production last year, which was about one-half that of 1913, is a significant achievement under all the circumstances, representing an increase of nearly one-third over 1920.

In pig iron the comparison is not so striking. At 508,000 tons per month in 1921, the rate is about 37 per cent of that in 1913. Of interest also is the wide spread last year between the pig iron and steel production as compared with 1913, and even

with 1920, steel output in 1921 exceeding pig iron by a larger margin than in any of the years under review. One explanation is the much larger use of scrap in German furnaces. In 1920, taking importations as a basis, scrap receipts were only 8371 tons per month, increasing to 21,901 tons per month in 1921. For the first half of this year, however, these importations averaged no less than 39,782 tons per month and 75,162 tons was received in June. The liberal use of scrap in steel making is not confined to Germany; it is a marked feature of open-hearth operations in the United States, Great Britain and other countries.

In 1913 and 1914 Germany stood second only to the United States as a producer of pig iron and steel, and that is her rank to-day, four years after the end of the great war. As a factor in world competition Germany is still to be reckoned with, the alternative of her political and industrial collapse being unthinkable, in spite of the débâcle in the mark which has led to so many gloomy predictions in recent weeks. Thus far in 1922 she has been second only to Great Britain as an exporter of steel.

Cycles and Current Phenomena

The two general methods of forecasting the future in commerce are by consulting the cycles and by considering the current phenomena. Of late we have been giving much attention to the business cycle, which is now rather popular. The chief objection to the cycle method is that the cycles are not of predetermined length and extent. Taking bank clearings for illustration, we do not know how long it will be from one low point to the next, nor, when the clearings increase, do we know in advance what the maximum will be. We know when we have passed the peak, but we do not know when we are closely approaching the peak.

More illumination could be obtained from current phenomena if there were more careful study of them. It can hardly be denied that usually there is very loose thinking on the subject. A rather substantial proof is the great vogue for many years of the digest that catalogues first the "favorable" and next the "unfavorable" items. The inference is that the "favorable" items are all of the same character, and similarly with the unfavorable. One may well suspect that the writers of these digests so feel, and it is obvious that such is the impression made upon the reader.

Yet in these digests items of widely different character are included. One just published mentions, as co-ordinate, that "banking and credit conditions are wonderfully good" and that "prices of many manufactured products are advancing." Both these indications may be good or encouraging, but a subject of this sort is worthy of more careful study. The two items are quite different in character. It is conceivable for banking and credit conditions to remain good for an indefinite period, while it is patently impossible for prices to continue advancing indefinitely. This same digest mentions as favorable that the country has "apparently passed safely" through the coal strike. That statement deserves study and analysis. It is not to be taken simply as a favorable vote for better business in future. It is good that the coal strike is settled, in the sense that the country is better off with the strike settled than it was during the strike, but it is not better off with this particular settlement than it would be with a different settlement, or than it was when coal miners were not being paid an unfair proportion of the country's total income.

In another review there are named among other favorable factors the building boom, the activity in automobile construction and the abundant crops. Probably the writer did not regard these items as co-ordinate, but the reader, whom it is desirable to educate, is likely to receive that impression. If we are to study economics for enlightenment and improvement in judgment, such items should be considered in detail. The abundant crops are an economic advantage, there being so much more of this world's goods for us to enjoy. The very phrase, "great building boom," used by the writer of the review is disquieting. A "great boom" suggests that men are paying too much and are not getting the worth of their money. The farmers do a certain amount of work in the year, and if that work produces large crops we are better off than if it produces small crops. A "great building boom" suggests precisely the opposite—that the results are small, instead of large, in proportion to the time the workmen put in.

The "unfavorable" items catalogued from time to time also deserve analysis. One current review mentions as "unfavorable" that "building activities are expected to decline with rents." We are here to live in houses, not to build them. It may not be good for carpenters, but it is better for the nation to have enough houses than not enough.

Carefully studied, the current phenomena will illuminate the future, but making two hodge-podges, one of "favorable" and the other of "unfavorable" phenomena, is not conducive to straight thinking and safe conclusions.

Is Welfare Work Overdone?

One factor in the readjustments made during the recent depression was what has been termed the liquidation of welfare work in industrial establishments. In many cases this phase of management had passed reasonable bounds. Even before the slump in business compelled curtailment not a few employers had been looking askance at what had been developed in the effort to procure and maintain contentment and esprit de corps. In some instances owners had made of their welfare departments a hobby; funds being ample, they had ridden the hobby much further than they had realized. In other cases there had been a rapid growth to formidable proportions in the competition for labor in a market where the supply was much under the demand. Another influence was the employment of specially trained men and women to conduct the department. Naturally they were altruistic in their aims.

In cases where the system was carried too far an unfavorable reaction had begun to be felt. Employees, among themselves and outside, had openly expressed the wish that some of the welfare money might better be spent in wages, though probably few of them at that time thought that

wages were low. Then came dull times, and this being an expense that could be dropped quickly, the item was eliminated in many establishments, with the double satisfaction of effecting needed economy and of getting rid of a top-heavy burden.

Whatever the motive for industrial welfare work, whether it be philanthropy or cool-headed business or both, as is usually the case, the aim is the same—to keep men and women cheerful of mind, strong of body, loyal to the firm. Naturally when this condition exists it spells efficiency of production and reduced overhead, notably in labor turnover. But in the past few years it has been proved that the system may defeat its own ends and result in a measure of discontent. Much of the means of securing contentment, such as well-lighted, well-ventilated working places, with accident hazard reduced to the lowest possible point, does not class with welfare work. The same is to be said, too, of the hospital or infirmary, with the shop physician and nurse, and some other things which in their beginning were established from kindly rather than from business motives.

The real welfare work has many sides—the recreation and athletic field and athletic teams; garden plots; recreation hall, playground for employees' children, restaurant; house building plan, in which the company assists in financing the establishment of a home; group insurance, thrift-encouraging projects; Americanization classes, part-time classes for the training of boys and girls, and evening classes for any who may care to join them; clubs to bring together employees having some common interest—and so on through a long list of activities. Every one of them is a good thing, in its place, when carried forward wisely and not extravagantly.

The trouble comes from attempting too much, if one is to judge from recent experiences. Every industrial plant is the better for the introduction of some phase of the work, but there are few that can carry them all. It should be recognized as a fact that such a system may become an actual burden to workers. They are offered too much and feel a sort of duty in accepting, until a good part of the time they have to themselves is eaten up in affairs auxiliary to their labor. They have lost the spontaneity of their recreation.

One genuine evil has crept into some of the welfare systems, particularly in connection with athletics. A ball nine or football team is organized from among the regular employees. As competition gets keen with rival works or departments, men begin to be hired with fully as much attention to their athletic skill as to their expertness as workers. The next step is hiring athletes, or it may be musicians for the band, or other specialists, and giving them sinecure jobs. Fellow employees do not like that. Men resent working hard at their daily tasks side by side with one who not only is not up to his job, but is permitted to soldier at will. Thus the purpose of creating shop spirit by a common pride in the ball nine, for example, is frustrated. It would be better to hire professionals without pretense of giving them other employment. But, give a man a nine or a crew made up of bona-fide workers, his own friends, and no more ardent partisan could be asked for when the shop turns out to see the game. It is a good rule for an executive, that the aim of his welfare department is to better the employees' condition and not to add glory to the name of his company or to his own department.

CORRESPONDENCE

Income Taxes and Industry

To the Editor: Your recent editorial entitled "Uneven Tax Burdens" is in a sense rather misleading. If, for example, the people of New York State actually produced the income which furnished 25 per cent of all taxes collected by the Bureau of Internal Revenue, then your conclusions would be sustained.

However, such is not the case. New York is the center of large corporate interests whose properties ramify throughout the United States. Thus, for example, taxes are paid in this State upon the wealth produced by the development of oil in Oklahoma, or copper in Arizona. These examples could be multiplied indefinitely. If taxes were distributed back to the States where the actual production occurred, there would be decided leveling up of the revenues complained of.

Furthermore, the regions most heavily taxed are those of greatest industrial development. Naturally they contain the greatest amount of invested capital and have the largest means of production. Taxes, like wages, must in the last analysis be paid out of the wealth created in this way. It is difficult, therefore, to comprehend a system of taxation which would not take its largest toll in the regions of greatest production.

If, on the other hand, taxes were levied on consumption rather than upon income, the showing based upon population would be more uniform, but not equal. Consumption is always greatest where production is greatest and the same regions would still pay the largest share of the tax.

In this connection another serious question can be raised. Would not a direct consumption tax result in the decreased use of commodities, so that the market for the products of the now "unhampered industry" would be destroyed?

ALWIN SCHALLER,
General manager McEwen Brothers.
Wellsville, N. Y., Sept. 6.

Lower Rates on Pig Iron from Sheffield and Florence, Ala.

WASHINGTON, Sept. 19.—The Interstate Commerce Commission last week declined to suspend the Arrow Transportation Co. river-and-rail rate on pig iron from Florence and Sheffield, Ala., to points north of the Ohio River on the basis of $1.96 per ton to Metropolis, Ill., for river transportation and $2.26 from the river to Chicago, the rail movement being by way of the Chicago, Burlington & Quincy Railroad. This makes a rate of $4.18 from the furnaces in Florence and Sheffield to Chicago and $3.28 to St. Louis. The tariff was opposed by some Chicago interests and was supported by interests in southern Ohio and St. Louis. The tariff became effective Sept. 15.

The Attorney General of the United States has called the attention of the metal trades to the fact that throughout the country there are many instances in which manufacturers of metal badges, worn usually by officers of the law, have made or sold to unauthorized individuals metal badges purporting to be official insignia of Government officers. As a result of the promiscuous sale of such badges, many individuals have been arrested, charged with the false impersonation of Federal officers. A manufacturer of badges may be subjected to liability or at least to embarrassment because of the manufacture and sale of badges to unauthorized officers.

Car Shortage Follows Strike Troubles

Delivery of Iron and Steel Plants Delayed as Plants Resume —One Hundred Thousand Men Are Idle Owing to Closing of Ford Factories

YOUNGSTOWN, Sept. 19—In the Mahoning Valley the steel industry shows evidences of rapid recovery from restrictions on production imposed by the railroad strike. Lack of suitable cars is still a deterrent, however, and is impeding shipments of finished steel to some extent. One sheet interest, for instance, reports that it has approximately 3000 tons of sheets held up on its shipping platforms or in its warehouses by inadequacy of car supply. All of this tonnage represents business against which consumers have issued shipping instructions, and it is ready to go out as soon as cars are available.

Lack of cars is likewise retarding coal shipments in some measure. In shipping sheets and wire products, refrigerator cars have been employed for shipment direct into Chicago. In other cases, open top cars are being used, but the material is protected as much as possible against the weather by coverings.

Blast Furnace Operations

Of the 47 blast furnaces in the Youngstown district, 23 are now pouring, representing in excess of 60 per cent of the total iron capacity. On Sept. 14, the Republic Iron & Steel Co. turned the blast on a fourth stack in its Haselton group, while on Sept. 13 the Brier Hill Steel Co. started its third stack, and the Trumbull-Cliffs Furnace Co. its stack at Warren. In the Shenango Valley, two furnaces are being modernized by the William B. Pollock Co., and their capacity enlarged, one for the Sharpsville Furnace Co. and the other for the Shenango Furnace Co. A new stack of 400 tons capacity is being built for the Sharpsville Furnace Co., and a bin system installed for handling ore. The furnace of the Shenango Furnace Co. will be 500 tons capacity.

The Warren stack of the Trumbull-Cliffs company is producing basic iron, while the Republic company's latest active furnace is on Bessemer iron. In consequence, the company's Bessemer department, idle during the last 18 months except for brief and intermittent operation, resumed on Monday, and constitutes the most important addition to active Valley steel capacity this week. For the first time in many months, all four Bessemer departments in the Mahoning and Shenango Valleys are active, two operated by the Carnegie Steel Co., one by the Youngstown Sheet & Tube Co. and the fourth by the Republic company.

Mattie blast furnace of the A. M. Byers Co., Pittsburgh, will be blown in at an early date. No. 1 puddle mill of the company's plant at Girard, Ohio, resumed Sept. 15. It consists of 44 units. It is expected other furnaces in this territory will get under way before the end of September. Until the rail strike interfered with coal shipments, 26 of 47 stacks in both Valleys were pouring last Spring.

Steel Plants and Mills

Ingot capacity of the district is operating at 80 per cent. In the Mahoning Valley 45 of 51 independent open-hearth furnaces are charged. Six merchant bar mills are active, besides the finishing mills of the Carnegie Steel Co. at its Upper Union and McDonald plants. The Republic company has its large merchant mill at Haselton under power, and four smaller bar mills at its Brown-Bonnell works. The Sheet & Tube company's merchant bar mill was also scheduled to resume. This represents the highest bar mill operation in many months.

Tinplate production is an exception to the upward trend, the Liberty plant at Leavittsburg of the Trumbull Steel Co. being idle. The tin mills at its Warren property are active, however, while the Falcon Tin Plate Co. is operating its Canton plant on a normal production basis.

The Valley's sheet industry is practically on a normal basis, with 108 of 113 mills scheduled. The increase over last week is due to the additional mills operated by the Sheet & Tube company. This company and Republic are dividing 15 active pipe furnaces, out of a total of 17.

Manufacturers Confer—President Campbell Predicts Ample Supplies When Late Season Ends

WASHINGTON, Sept. 19.—The iron and steel and all other industries of the United States as well as the household will have adequate supplies of coal and prices will be lower after the navigation season on the Great Lakes closes, in the opinion of President James A. Campbell of the Youngstown Sheet & Tube Co., Youngstown, Ohio. This view was expressed to THE IRON AGE by Mr. Campbell last Friday when with other iron and steel executives he participated in the conference of business men regarding the bituminous coal situation held at the Department of Commerce. The meeting was made up of officials of the United States Chamber of Commerce, the American Railway Association, the National Association of Manufacturers, the National Association of Purchasing Agents, and the Public Utility Associations, who conferred with Secretary of Commerce Herbert Hoover, H. Foster Bain, director of the Bureau of Mines, and C. B. Aitchison of the Interstate Commerce Commission. The opinion of Mr. Campbell accorded with the general view of the conference.

Public Unduly Alarmed

Mr. Campbell said that there has been an undue alarm on the part of the public on account of the coal situation. He predicted that there would be a scarcity of coal until the lake navigation season ends and that high prices would prevail until then. But after the closing of navigation, he said there will be plenty of coal to take care of industry and households and that prices will be lower. He pointed out that it now is a question of railroad transportation, but that the railroads have placed tremendous orders for cars and locomotives and that the coal strike being settled and the rail strike being virtually over, the outlook is cheerful. It is to be expected, therefore, that after the Northwest has been supplied with its coal requirements, fuel will move in abundant quantities to industries and that increased production in steel and other lines will follow.

Lower Prices Expected

The conference itself went formally on record as believing that the natural processes of increased supply, provided distribution is facilitated, will bring down the price of coal and assure complete supplies to the householders and industry. A definite pledge on the part of commercial interests to aid in expediting those natural processes and determination on the part of the Government that advantage shall not be taken of

the recent strike in an effort to exact high coal prices from the public were evidenced at the conference. One of the most interesting points discussed was the question of priorities in the coal movement. In this connection, relief to the iron and steel and other industries, which are not on the preferred list, was indicated by the opinion of the meeting that mobility will be given to movement with less opportunity for speculation if the priorities to special uses which have been necessary prior to the re-opening of the union mines should be relaxed and priority parallel with agricultural produce should be given to the movement of all coal without discrimination as to consignees. It was also pretty generally the opinion of the meeting that all re-consignment rights upon coal should be abolished in order to prevent speculation in coal. This prompted the decision to organize special committees under the leadership of the Chamber of Commerce of the United States to advance these purposes.

Purposes to be Carried Out

The three major purposes for which the conference voted to organize voluntarily campaigns, were as follows:

1. To induce manufacturers, utility corporations, and buyers generally not to purchase coal beyond their day-to-day needs until the flow of coal becomes more normal.
2. To persuade holders of coal contracts not to call for delivery on those contracts past their day-to-day needs. It was considered that above one-half of the coal in the country is under contract at normal prices and that a relaxation in the demand for this coal to the minimum daily requirements would allow an increase in supply to the general public.
3. To expedite the movement of coal in every possible way.

Secretary Hoover's Views

In opening the conference, Secretary Hoover said it was most desirable that re-adjustments in prices and distribution should take place by natural means of increased supply and the holding down of consumption pending such increases. Production for the public must come, he warned, by one means or another.

The Secretary stated that while the bill pending in Congress would give powers to embargo shipments of extortionate priced coal moving in interstate commerce, the Federal Government could exert no constitutional control over coal produced and sold within State boundaries or over-speculation in interstate coal, once it had reached its destination. Many States were taking drastic legislative powers in these domestic matters and unless the situation quickly improved, no doubt many more of them would do so in order to protect their citizens.

It was agreed that the mines had ample capacity, even to the point of surplus, to meet the situation, that the problem was wholly one of transportation, and that the price would ameliorate if transportation could be increased and if in the meantime consumers would purchase only for their immediate needs.

Losses Overestimated

On the day preceding the conference, Secretary Hoover said that while the losses to the country, due to the two great strikes, are considerable, they are easily overestimated. He stated that the estimate of current coal miners' wages lost in the five months, is not a correct basis of estimation, because over a period of 18 months "we will probably consume approximately the same amount of coal." In other words, the Secretary pointed out, the miners will work more days in the week and produce more coal in the next six or eight months than they would have produced if there had been no strike, and thus the wage roll the next six or eight months will be larger and will, in a considerable degree, compensate the loss during this suspension.

Secretary Hoover added:

Farmers Are Heaviest Losers

"The real loss would lie more in the loss of productivity in industries that have, or might have, to close down as a result of the coal strike. If all of our industries can be kept in motion, the loss will be much less from the coal strike than is currently estimated.

"The greatest loss to-day is the one being met by the farmer as a result of the railway strike. The export of farm produce has been seriously interfered with by the inability of the railways to transport produce. Prices are therefore unduly depressed in the agricultural regions and the farmer is suffering grievously.

"The inability to transport manufactured products will create some degree of loss, but not so serious as that to agriculture.

"There are other losses that must be counted into the National balance sheet, such as the damage to the railways, the extra charges which they have been put to, the cost of keeping the mines open and maintaining them during the period of suspension, and a hundred other items that are of importance. In the broad view, however, if we can get back to business, if we can secure a resumption of transportation and rapid distribution of coal and agricultural produce, we will not have received such an economic wound as cannot be very quickly recovered from. We will probably not be on such a high plane of business prosperity during the next six months as we would have been, had the strikes not taken place, but we will undoubtedly be on a much higher and much more comfortable plane than that of last year."

Those in Attendance

Among those who attended the conference on last Friday were the following:

James A. Campbell, president Youngstown Sheet & Tube Co., Youngstown.

E. A. S. Clarke, president Consolidated Steel Corporation, New York.

Harry Coulby, Pickands, Mather & Co., Cleveland.

R. P. Lamont, president American Steel Foundries, Chicago.

A. A. Landon, vice-president American Radiator Co., Buffalo.

Charles K. Foster, vice-president American Radiator Co., Chicago.

S. M. Vauclain, president Baldwin Locomotive Works, Philadelphia.

J. E. Edgerton, president National Association of Manufacturers, Nashville, Tenn.

Alexander Legge, president International Harvester Co., Chicago.

Ford Furnace Plant Operating on a Reduced Scale

DETROIT, Sept. 18—The Ford layoff became an actuality Friday night when several thousand men reporting for duty at 11 o'clock at the Rouge plant were ordered to turn in their tools. A few were retained at the foundry, coke ovens and blast furnaces. The night force at the Highland Park plant were released early Saturday morning so that by Saturday night the suspension of Ford manufacturing in Detroit was complete. This means that approximately 70,000 men in Detroit have been thrown out of work at the Ford plants and another 30,000 employed by companies dependent upon Ford production will likewise be idle, making a total of 100,000. A conference of Ford executives held Friday afternoon was for the purpose of determining whether it would be possible to keep part of the plants in operation. The coal situation is admittedly better but no statement has been made by the Ford officials as to whether their fuel situation would have permitted a continued operation.

Although definite announcement was made about three weeks ago that the Ford industries would close on Sept. 16, considerable doubt existed until the last moment as to whether this program would be carried out.

The Ford blast furnace and coke ovens are in operation on a reduced scale. Probably 10,000 to 15,000 men were retained at both plants. Highland Park and River Rouge parts manufacturers are feeling the effects and reducing working forces. There are numerous predictions that the shut-down will not last more than three weeks. No statement has been made by the Ford Motor Co.

It is significant that reports from the members of the Detroit Employers Associations show very few increases in employment, figures for the week giving 175,800 which is a decrease of 2,200 as compared with 178,000 employed a week ago.

The General Motors plants in the State of Michigan have shown no signs of reducing their production schedules and Arthur T. Waterfall, vice-president of Dodge Brothers, announced Friday that this company is running to capacity and does not expect any retrenchment.

Efforts to Unionize Connellsville Miners Fail

UNIONTOWN, PA., Sept. 18.—Increased production was the feature of the situation in the Connellsville bituminous region last week. This is being brought about by the importation of hundreds of additional workers and increased efficiency on the part of the men who have been coming into the region during the past few weeks.

Efforts at unionization of the Connellsville field have failed. The developments of the past week have strengthened the situation as pertains to the larger operations and it is not believed that another single operation will affiliate with the union.

Evictions in the various plants continue with increased force. At one plant, 40 persons about to be evicted went to the management and asked to return to work. They are working and are still in their houses.

Action of the United Mine Workers in sending a telegram to the United States Senate through Senator Tom Watson asking for an investigation of the evictions in the region, failed to cause a ripple among operators in the region. Such an investigation would receive no opposition whatsoever from the operators in the region. Men who refused to work were allowed to remain in the houses for weeks before they were put out.

In every instance, they were given an opportunity to accept their old jobs back and upon their refusal eviction warrants were issued and served at the expiration of the time limit prescribed. Observers in the region declare that the operators have more than played square in these proceedings. One operator, after informing his men that they might have an opportunity to go back to work, and the men refused, told them he would pay their moving expenses, up to $20 a family, if they wanted to move to other plants.

The situation narrows down to this: Those workers who went out on strike on April 1 and refuse to return to work at the present wage scale must make way for the hundreds of workers who are coming into the region to go to work.

Transportation Still Dominates the Situation

WASHINGTON, Sept. 19.—Increased production of coal gives further confirmation to the fact that the problem now is one of transportation and not mining. This situation is generally recognized and it is restated in a communication from the Chamber of Commerce of the United States to industries of the country in seeking their co-operation for the purpose of stabilizing the coal situation. The letter follows the conference held last Friday between Government officials and business interests and the plan of the Chamber was put into operation to-day. At the same time, the Congress has passed the so-called anti-profiteering fuel bill.

The other piece of legislation regarding the coal situation provides for an investigation of the coal industry by a Federal coal commission and suggestions for the investigation have been made by Secretary of Labor Davis in a letter to Senator Shortridge of California.

Production of all coal, anthracite and bituminous, in the week ended Sept. 16, is estimated by the Geological Survey at 10,200,000 to 10,500,000 tons. The output of bituminous coal is not expected to exceed 9,500,000 tons. The rate of production has not been under this figure during the three weeks period following the general resumption of mining under the Cleveland agreement. Loadings on Monday, Sept. 11, were 35,808 cars, a larger number than reported for any day since March. However, there was a drop on the following days and on Thursday, the latest day of which there is a report, loadings totaled 26,923 cars.

"Transportation is the dominant and limiting factor in soft coal supply," the Geological Survey says. "Restricted by transportation difficulties the rate of soft coal production is seemingly fixed temporarily at 1,600,000 tons a day, or 9,600,000 tons a week—this in spite of a strong market and prices sustained at high levels not only by demand for current consumption but also by the need for rebuilding ordinary reserves and by extraordinary call for household sizes.

CAR ORDERS MODIFIED

Interstate Commerce Commission Grants Greater Freedom in Moving Certain Commodities

WASHINGTON, Sept. 19.—Greater freedom in the movement of iron and steel, lumber and other products generally will be allowed as the result of car service order No. 25 issued this afternoon by the Interstate Commerce Commission to become effective midnight, Sept. 21. The order increases the number of commodities to which the railroads are to give preference movement, provided they can move all traffic as ordered, and at the same time abolishes the priorities created for the benefit of preferred users of coal, except when such preferences may be ordered by the Commission itself.

This will result in greater movement of coal also to iron and steel and lumber plants which have not been on the preferred list. The order of the Commission reduces the number of its service agents to four, three of whom are in the Washington office, and one left in the field to take care of Lake cargo traffic at Cleveland. This order supersedes order No. 23, which is to be suspended at midnight, Sept. 20.

Commodities added to the list of those given preferred movement are mine supplies, medicines, fertilizers, seeds, newsprint paper and petroleum and its products.

The new orders allow the use of open top cars for loading with other commodities while they are on their way back to the mines, and among other things this will be helpful for the movement of iron ore. This is made contingent upon the fact that loading is to points not beyond the mines, and such loading will not delay or minimize the production and transportation of coal. By this order use of cars will be allowed for hauling road and building material and fluxing stone for furnaces.

The Commission simultaneously issued an order changing order 24 so as to conform to order 25 in the list of commodities to be given preferred movement. This has no effect on order 22 relating to routing of traffic so as to avoid congestion. The changes made accord with recommendations made at the Hoover coal conference last Friday.

Addition to the list of commodities given preferred movement was made necessary by the fact that the railroads in the issuance of embargoes included in the prohibited lists commodities which the Commission considered to be essential and permitted commodities to move which were not so considered.

Iron and Steel Markets

LARGE RAIL ORDERS

Heavy Tonnages Likely to Be Closed Before Oct. 1

Steel Output Increases and the Volume of Business at Premium Prices Is Less

Further increases in output of pig iron and steel are reported from all producing centers, and at the same time there is a falling off in the volume of new business done at premium prices. Both movements represent progress out of the scarcity market conditions created by the double strike.

Eight additional blast furnaces, chiefly in Ohio and Western Pennsylvania districts, have been blown in. As a whole the steel industry is probably running at a 65 per cent rate, and there is the unusual condition of several large independent companies exceeding the rate of the Steel Corporation. Connellsville coke output gains but slowly, and most of the blast furnaces just started are getting their coke elsewhere.

Of first importance in the week's developments was the decision of the Steel Corporation to advance its rail price to $43 on Oct. 1, and meanwhile to book orders for the first half of 1923 at $40. At least one large independent company has announced a like policy.

It already appears that a large tonnage of rails will be booked for next year by Oct. 1. At Chicago orders for 100,000 tons have been placed already, and a total of 300,000 is expected by the end of the month. In the East an initial inquiry of 125,000 tons for the New York Central has appeared, and options are asked on 25,000 tons more up to March 1 and 50,000 tons up to June 1. Other tentative tonnages are 25,000 for the Norfolk & Western, 13,000 for the Reading and 8000 for the Long Island. If the Pennsylvania inquiry equals the 200,000 tons distributed for 1922 and the B. & O. and other lines come forward in the way that now seems likely, the rail mills will have much better backlogs for the winter than were in sight last autumn.

Buyers of steel regard the efforts of the mills to insure winter rail rollings an index to the expected easing of conditions in the heavier products later in the year. It is recognized, however, that heavier coal deliveries mean also shortages of cars for certain finished products.

For the 1000-mile joint pipe line of the Standard and Sinclair companies the National Tube Co. will furnish 100,000 tons of 8, 10 and 12-in. pipe.

An order of the Commerce Commission effective Sept. 21 abolishing certain priorities on coal will result in a larger coal movement to iron and steel plants. More freedom is granted also in the use of open-top cars. However, the transportation situation at Pittsburgh is not good and no marked improvement is in prospect. With car shortages limiting production, coke has gone to $11.50, an advance of 50 cents in the week and of $1.50 in two weeks.

New locomotive orders total 189 and fresh inquiries 68, not including 100 expected shortly from the Santa Fe and 50 each from the Burlington and Rock Island. Special efforts are being made to expedite deliveries on locomotive steel.

At Chicago track spikes and bolts are $2 a ton higher, and light rails $3, in line with the new price for standard sections.

September fabricated steel contracts are below the rate of any of the last six months, but at 55 per cent of capacity are fully up to the average of the last decade. A further falling off is indicated as fresh projects are fewer. In reinforcing bars a water project at Tulsa, Okla., will mean a large tonnage, probably 7500 tons.

Cast iron pipe has been advanced to a $40 base, Birmingham, for 6-in. pipe and larger and business is still moving in fair volume.

Advances in steel castings, ranging from 15 to 20 per cent, are looked for, effective Oct. 1.

The price of Southern pig iron again has been advanced $2, and $27, Birmingham, is now the usual quotation, but owing to freight congestion, very little Southern iron is being delivered. The sale of 20,000 tons of basic at $34, Valley, apparently represents an advance of $1.50, although the transaction is understood to have some special features. Owing to reduced freight rates on pig iron from Florence and Sheffield, Ala., by barge and rail, Southern iron promises to be a more important factor in St. Louis and Chicago. Foundry iron prices show little change, and in some centers conditions are easier, but delays in deliveries are frequent. At 161,000 tons on Sept. 1 merchant pig iron stocks of regularly reporting furnaces were the lowest in many months.

Low phosphorus iron is now figuring in import sales. One lot of 5000 tons has been closed for an eastern Pennsylvania foundry and considerably more is under negotiation.

Pittsburgh

Number of Sellers Increases, But Price Trend Is Still Upward

PITTSBURGH, Sept. 19.—Increased production of pig iron by the steel companies has begun to show in a moderate way in the production of steel, and in a few lines, notably in steel bars, there are more sellers than there were recently. Prices, however, are no softer; on the contrary, the trend is still in the other direction and must necessarily hold to this tendency so long as the demand exceeds the supply, as is still the case. The Steel Corporation in this district does not seem to be able for one reason or another to greatly increase output or reduce its obligations and of course cannot take on much, if any, business for early delivery. The bulk of the demand is for early shipments and the position of the Steel Corporation naturally throws most of the orders to the independents. The latter are not taking long time obligations with serious transportation difficulties believed to be immediately ahead, and moreover, selling for brief periods will enable them to apply promptly any increases in costs to selling prices.

Partial settlement of the strike of the railroad shopmen has not had much effect yet upon the operation of

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Sept. 19, 1922	Sept. 12, 1922	Aug. 22, 1922	Sept. 20, 1921
No. 2X, Philadelphia‡	*$34.26*	$34.64	$33.14	$21.34
No. 2, Valley furnace†	**36.50**	35.00	33.00	21.00
No. 2, Southern, Cin'ti†	29.05	29.05	24.05	23.50
No. 2, Birmingham, Ala.†	25.00	25.00	20.00	19.00
No. 2 foundry, Chicago*	32.00	32.00	30.00	22.00
Basic, del'd, eastern Pa	*31.00*	32.00	28.64	19.25
Basic, Valley furnace	**34.00**	32.50	26.00	19.25
Valley Bess., del. Pitts	**35.77**	34.77	31.76	21.96
Malleable, Chicago*	32.00	32.00	30.00	22.00
Malleable, Valley	**34.00**	33.00	31.50	20.00
Gray forge, Pittsburgh	**37.77**	36.77	34.76	21.96
L. S. charcoal, Chicago	36.15	36.15	34.65	33.50
Ferromanganese, seaboard	67.50	67.50	67.50	60.00

Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$40.00	$40.00	$40.00	$47.00
Bess. billets, Pittsburgh	40.00	40.00	37.50	29.00
O.-h. billets, Pittsburgh	40.00	40.00	37.50	29.00
O.-h. sheet bars, P'gh	40.00	40.00	37.50	30.00
Forging billets, base, P'gh	45.00	45.00	43.00	34.00
O.-h. billets, Phila	45.17	45.17	42.67	35.74
Wire rods, Pittsburgh	47.50	47.50	45.00	41.00
Skelp, gr. steel, P'gh, lb.	2.00	2.00	2.00	1.65
Light rails at mill	**2.25**	2.00	1.90	1.75

Finished Iron and Steel, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.575	2.575	2.325	1.95
Iron bars, Chicago	2.25	2.25	2.15	1.75
Steel bars, Pittsburgh	2.00	2.00	2.00	1.60
Steel bars, Chicago	2.10	2.10	2.35	1.75
Steel bars, New York	2.34	2.34	2.34	1.98
Tank plates, Pittsburgh	**2.25**	2.00	2.00	1.60
Tank plates, Chicago	2.30	2.30	2.20	1.75
Tank plates, New York	**2.49**	2.34	2.34	1.98
Beams, Pittsburgh	2.00	2.00	2.00	1.60
Beams, Chicago	2.20	2.20	2.35	1.80
Beams, New York	2.34	2.34	2.34	1.98
Steel hoops, Pittsburgh	2.75	2.75	2.75	2.15

Sheets, Nails and Wire, *Per Lb. to Large Buyers:*	Sept. 19, 1922 Cents	Sept. 12, 1922 Cents	Aug. 22, 1922 Cents	Sept. 20, 1921 Cents
Sheets, black, No. 28, P'gh	3.35	3.35	3.35	2.75
Sheets, galv., No. 28, P'gh	4.35	4.35	4.35	3.75
Sheets, blue an'l'd, 9 & 10	2.50	2.50	2.50	2.20
Wire nails, Pittsburgh	2.60	2.60	2.60	2.90
Plain wire, Pittsburgh	2.35	2.35	2.35	2.60
Barbed wire, galv., P'gh	3.15	3.15	3.15	3.55
Tin plate, 100-lb. box, P'gh	$4.75	$4.75	$4.75	$5.25

Old Materials, Per Gross Ton:				
Carwheels, Chicago	**$24.50**	$23.50	$21.00	$14.50
Carwheels, Philadelphia	**23.00**	21.00	19.00	17.00
Heavy steel scrap, P'gh	**21.00**	19.50	18.25	14.00
Heavy steel scrap, Phila	**18.00**	16.00	15.50	11.50
Heavy steel scrap, Ch'go	*18.00*	18.50	16.00	11.50
No. 1 cast, Pittsburgh	**24.00**	21.50	19.00	17.00
No. 1 cast, Philadelphia	**23.00**	21.00	19.00	17.00
No. 1 cast, Ch'go (net ton)	*21.00*	22.00	19.50	13.25
No. 1 RR. wrot., Phila	**22.00**	21.00	18.50	15.00
No. 1 RR. wrot. Ch'go (net)	*17.50*	18.00	15.25	11.50

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	**$11.50**	$11.00	$12.00	$3.25
Foundry coke, prompt	12.50	12.50	13.00	4.25

Metals, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Lake copper, New York	14.12½	14.12½	14.12½	12.25
Electrolytic copper, refinery	13.75	13.75	13.75	12.12½
Zinc, St. Louis	**6.65**	6.37½	6.22	4.17½
Zinc, New York	**7.00**	6.72½	6.57½	4.67½
Lead, St. Louis	**5.90**	5.60	5.60	4.45
Lead, New York	**6.25**	5.95	5.90	4.65
Tin (Straits), New York	32.12½	32.12½	32.50	26.50
Antimony (Asiatic), N. Y.	**6.75**	6.25	5.25	4.45

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.
The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price, Sept. 19, 1922, Finished Steel, 2.419c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

Sept. 12, 1922,	2.412c.
Aug. 22, 1922,	2.412c.
Sept. 20, 1921,	2.200c.
10-year pre-war average,	1.689c.

These products constitute 88 per cent of the United States output of finished steel

Composite Price, Sept. 19, 1922, Pig Iron, $32.54 Per Gross Ton

Based on average basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

Sept. 12, 1922,	$31.52
Aug. 22, 1922,	26.86
Sept. 20, 1921,	20.01
10-year pre-war average,	15.72

those roads in this part of the country which were most seriously affected. The trouble, primarily, has been due to the crippled condition of motive power and now that so many cars have been loaded with coal there is a shortage of cars for the movement of steel. The Carnegie Steel Co. has suffered especially from car shortages lately, and is likely to inaugurate before long river deliveries at least in and around the Pittsburgh district. If the transportation conditions get as bad as they are expected to, it is probable that all of the steel makers here in a position to do so will use the river for getting material away from the mills.

Suspension by the Ford Motor Co. last Saturday was a surprise to a good many of the steel trade who had looked upon the announcement with some skepticism. It is now stated that the step was necessary to avoid being regarded as a bluff, and that there will be a resumption by the Ford company at an early date. It is said that the Ford company did not suspend because of lack of orders and that consequently it is not likely to remain down long. The real effect of this suspension has not yet been fully felt, because there were a good many modifications of the original orders suspending shipment of materials. This, however, will be felt later on when the Ford company does resume, as it is reliably reported that as a result of the late shipments the company has fully a month's stock of material on hand.

A further advance of $11 per ton has been announced since a week ago in wrought iron pipe, making a total of $21 per ton in about a month. A further advance in steel pipe appears to be likely since it is claimed that the higher wages more than offset the increase announced by independents Aug. 15 and followed by the National Tube Co. Aug. 23. A feature of the tubular goods market has been an order for a 1000-mile pipe line by the Standard Oil Co. of Indiana and Sinclair Oil Co. jointly. The National Tube Co. will furnish more than 100,000 tons of 8, 10 and 12-in. pipe for this line.

Announcement of the increase in the price of rails, effective Oct. 1, has not yet been productive of many orders to the local maker, although it is stated that railroads ordinarily served from Pittsburgh are figuring on their requirements and will get the orders in before the new prices are in effect.

Most grades of pig iron have advanced since a week

ago, basic going to $34 on a sale of 20,000 tons by a Youngstown steel maker. Largely as a result of the activities of dealers, there has been a further sharp advance in scrap prices. With car shortages limiting production, coke prices have gone up further.

Pig Iron.—Those who must have pig iron for early delivery find they must meet sellers' price ideas. A Youngstown steel maker recently sold 20,000 tons of basic iron at $34, furnace, and while there has been some disposition to question the sale, some claiming that some sort of a trade was involved and that consequently the transaction could not be regarded as setting the market at that figure, it is a fact that on two or three good sized inquiries which lately have been out, the quotations have been above $34. Moreover, it is believed that two companies now seeking round tonnages would pay $34 to secure them. The market, therefore, cannot be well quoted below this price. Bessemer iron has advanced $1 per ton, to $34, Valley furnace, on a number of small sales, but the largest sale of this grade in this district lately was one of 1000 tons, the iron being sold by a western Pennsylvania steel maker at $33.50, furnace, the freight rate to Pittsburgh being the same as from the Valley, or $1.77. We note a sale of 1500 tons of foundry iron to a local sanitary ware manufacturer on a basis of $36, Cleveland, for the base grade. This means $38.55, delivered Pittsburgh, and figures $36.88, Valley furnace. There is no foundry iron available at present from any of the Valley furnaces, but it is possible that the A. M. Byers Co., which will light up its Mattie furnace at Girard, Ohio, late this week, will have some tonnage for market, and there is also a possibility that some of the steel companies may make some foundry iron. There is no Valley basis on foundry iron, but based on prices in other markets, it is probable that the price would be $36.50 to $37 for shipment to Pittsburgh.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$34.00
Bessemer	34.00
Gray forge	36.00
No. 2 foundry	$36.50 to 37.00
No. 3 foundry	36.00
Malleable	34.00

Ferroalloys.—With indications of an early passage of the tariff bill, imposing a duty of $33.60 per ton on 80 per cent imported ferromanganese, there is little disposition on the part of domestic producers or dealers who have stocks of foreign material in this country to consider selling and prices either on the domestic or foreign material for spot shipment are nominal. British material still is priced at $67.50 c.i.f. Atlantic seaboard for 80 per cent for future shipment, but whether it will stay at that price after the tariff goes into effect depends on the prices named on domestic material. Collection of the new duty is going to be more bothersome than former ones, since it provides for 1⅞c. per lb. contained manganese and this entails close analysis of every shipment. The Jones & Laughlin Steel Co. has started making its own ferromanganese and is understood to have a supply of ore sufficient to run it more than two years. Spiegeleisen is about $1 a ton lower. The asking prices still are $38, furnace, for average 20 per cent material and $37 for 16 to 19 per cent, but sales of the former grade have been made at $37. There has been no change in 50 per cent ferrosilicon, but ferrotungsten already has been marked up to 60c. per lb. contained in anticipation of the passage of the tariff.

We quote 78 to 82 per cent ferromanganese, $75 c.i.f. Atlantic seaboard for domestic; British, spot, $70 to $72.50; British, future, $67.50; German, 76 to 80 per cent, $67.50 to $70. Average 20 per cent spiegeleisen, $37 to $38 furnace; 16 to 19 per cent, $36 to $37 furnace; 50 per cent ferrosilicon, domestic, $55 to $60 furnace, freight allowed. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, $50.50; 11 per cent, $53.80; 12 per cent, $57.10; 13 per cent, $61.10; 14 per cent, $64.10; silvery iron, 6 per cent, $39; 7 per cent, $40; 8 per cent, $41.50; 9 per cent, $43.50; 10 per cent, $45.50; 11 per cent, $48.80; 12 per cent, $52.10. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $3.66 per gross ton.

Steel Skelp.—As high as 2.50c. still is obtainable on all tonnages of narrow grooved skelp for early delivery, but the prevailing market is about 2.25c. and large users, buying on contract, are beginning to find accommodation from independent makers at 2c. for their requirements of both grooved and sheared material.

Wire Products.—While a fair amount of business is passing in nails at $2.75 base per keg, Pittsburgh, the failure of the leading interest to follow the advance recently set up by independent manufacturers appears to be exerting conservatism among buyers with regard to their general requirements. This condition, however, does not disturb the strength of the market because a shortage of wire drawers is felt in all products and a shortage of box cars impedes deliveries. Prices are given on page 755.

Iron and Steel Pipe.—Leading makers of wrought iron pipe have issued new cards, dated Sept. 12, further increasing prices of standard pipe $11 per ton, by a reduction in the discount of 5½ points. This makes a total advance in wrought iron pipe in about a month of $21 per ton and the new discounts of the largest producer now are only slightly below those quoted by this interest throughout the greater part of 1920. Some business pending at the former discount was driven in by the advance, but trading at the new prices is very limited. Prices of steel pipe are firm at the advance of about a month ago. One independent producer is said to be contemplating a further advance of $6 per ton next week. A feature of the week in steam pipe has been the placing of a 1000-mile line to tap the Wyoming field by the Standard Oil Co. and Sinclair Oil Co., jointly. This order was placed with National Tube Co. and will aggregate about 100,000 tons. It is the largest individual order on record. There is no appreciable let up in the demand for merchant pipe, least of all in the butt weld sizes. Discounts are given on page 755.

Boiler Tubes.—Withdrawal of quotations by some makers of charcoal iron boiler tubes is taken to mean a further advance in prices in line with the advance recently announced in wrought iron pipe. Iron tubes are not selling with much freedom in competition with steel tubes. There is good demand for the latter. Discounts are given on page 755.

Wire Rods.—The market does not grow any easier, because available supplies consist of the small tonnages resulting from the inability of wire manufacturers to secure a sufficient number of wire drawers. For early delivery the market still is quotable at $47.50, base, for common soft rods, this having been the basis of the most recent business. Steel production is gaining, however, and makers may soon name prices on fourth quarter contracts. The common expectation is that the price will be around $45. The leading interest has made no public announcement of any change from $43 for the base size of soft rods.

We quote No. 5 common basic or Bessemer rods to domestic consumers, $47.50; chain rods, $47.50; screw stock rods, $52.50; rivet and bolt rods and other rods of that character, $47.50; high carbon rods, $54.50 to $57.50, depending on carbon, per gross ton, f.o.b. Pittsburgh or Youngstown.

Billets, Sheet Bars and Slabs.—The supply situation is growing slightly easier with independent producers, notably on Bessemer steel, due to the more abundant supply of coal and the increase in pig iron production. It is comparatively easy to secure Bessemer billets and sheet bars at $40, Pittsburgh, but there is still some difficulty in obtaining supplies of open-hearth material, for up to this time open-hearth operations have not risen as rapidly as have those of the blast furnaces, because few manufacturers had any stocks of cold pig iron when the fuel situation eased up. A change for the better with respect to open-hearth steel supplies is expected shortly, however, and while fourth quarter prices are not yet being announced, it is believed they will not be above $40 on sheet bars, billets or slabs. For early delivery $42 is being asked by some makers on open-hearth sheet bars.

We quote 4 x 4-in. soft Bessemer and open-hearth billets, $40; 2 x 2-in. billets, $40 to $42; Bessemer sheet bars, $40; open-hearth sheet bars, $40 to $42; slabs, $40; forging billets, ordinary carbons, $45 to $47, all f.o.b. Pittsburgh or Youngstown mills.

Sheets.—The market still exhibits considerable firmness, more in galvanized and full finished stock than in ordinary black sheets, but this condition is due to a large extent to costs, rather than to the urgency of the demand. The leading interest because of its inability to secure sufficient supplies of steel has relatively heavier obligations than the independents. The latter have been operating at a pretty high rate over the past month or six weeks, and running at the recent rate their net obligations are equal to slightly less than 1½ months' production. It is a question whether this showing is not due to an unwillingness of buyers to commit themselves as much as the unwillingness of makers to sell. The American Sheet & Tin Plate Co. last week operated 71 per cent of its mills, but probably will not do that well this week, because transportation conditions are interfering with steel supplies. Independent companies are averaging well above 80 per cent operations. Prices are given on page 755.

Tin Plate.—The situation is without special change. This is the quiet season of the year and with supplies ample for all requirements, increased costs as yet are without effect upon selling prices.

Cold-Finished Steel Bars and Shafting.—The market is fairly steady in spite of the loss of the Ford tonnage for the time being and a slightly easier supply situation with respect to hot-rolled bars. Some of the independent makers of the latter lately have resumed rolling and shipping. Corporation deliveries, however, still are limited and if there were a really active demand for cold-finished bars the market would be stronger. All makers are quoting 2.50c. base Pittsburgh for carloads, but there are some deviations from this base. Ground shafting is unchanged at 2.90c. base, f.o.b. mill, for carload.

Hot-Rolled Flats.—The market is firm at 2.75c. base, Pittsburgh minimum, on the ordinary widths and gages, but for prompt delivery premiums of $2 to $3 are fairly common and on narrow light stock some makers are unwilling to consider less than 3c. base. Suspension of the Ford Motor Co. has not yet been seriously felt by makers of strips.

Cold-Rolled Strips.—Most makers still are open to business at 4.25c., base, Pittsburgh, but there are instances where premiums for prompt delivery of as much as $5 per ton have been paid.

Iron and Steel Bars.—Some of the independents are slightly freer sellers than they were recently and generally are quoting 2c. base, Pittsburgh, on desirable tonnages for delivery in four to six weeks. As much as 2.25c. still is asked by some for small tonnages, but the real market appears to be crystallizing around 2c. The Carnegie Steel Co. still is having trouble in catching up with its obligations, and is largely out of the market. Iron bars are firmer at 2.50c. base, for refined iron in carload lots.

We quote steel bars rolled from billets at 2c. to 2.25c.; reinforcing bars, rolled from billets, 2c. to 2.25c. base; rail steel reinforcing bars, 1.90c. to 2c.; refined iron bars, 2.50c. in carloads, f.o.b. mill, Pittsburgh.

Nuts and Bolts.—Demand is reported to be brisk and with supplies of steel still difficult to obtain, prices are firmly maintained. Discounts are given on page 755.

Rivets.—The market holds firm since there is a demand that is hard to meet because of the scarcity of railroad material. Prices and discounts are given on page 755.

Track Fasteners.—Good demand is noted for small spikes and as makers are heavily committed and find it hard to get sufficient supplies of steel, they are inclined to seek higher prices. The minimum now is 3.25c. base, Pittsburgh, and some are asking 3.50c. Large spikes also are firm, with 2.75c. the minimum and some makers quoting 2.85c. Demand is moderate, but few makers are anxious for additional business. It is expected that angle bars will advance with standard rails on Oct. 1. Prices are given on page 755.

Structural Material.—The market still shows considerable firmness, although the approach of the end of the active building operations is reflected in fewer structural awards and fewer new inquiries. The market has not lately been much above 2c. on sizable inquiries, but on small tonnages for quick delivery is quotable up to 2.25c. Prices are given on page 755.

Plates.—Specific tonnages are not especially numerous, but there are some orders from tank and boiler makers for stock. Independents seem to be getting the bulk of the business because of the heavily committed condition of the steel corporation and the independent price on plates is 2.25c., Pittsburgh. Lately that price has not been exceeded much or frequently. Prices are given on page 755.

Steel Rails.—It is expected that independent rail makers will meet the advance recently announced by the Steel Corporation of $3 per ton on standard rails, effective Oct. 1. While not many orders have been placed with local makers, it is expected the railroads tributary to Pittsburgh will get in their specifications in time to escape the increase. Light rails rolled from new steel are quoted by all makers at 2.25c., base.

We quote 25 to 45-lb. sections, rolled from new steel, 2.25c. base; rolled from old rails, 2c. base; standard rails, $40 per gross ton mill for Bessemer and open-hearth sections.

Coke and Coal.—While it is reported that there has been some weakening among the strikers in the Connellsville district, and in a number of places the men are seeking work, production has not increased because the limited supply of cars will not permit the putting on of additional men. The demand for furnace coke exceeds the offering and as high as $12 per net ton at ovens lately has been done. On the basis of recent sales, the market is quotable at $11.50 to $12, but the indications are that $12 soon will be minimum. Foundry coke is quotable from $12.50 to $13.50, but is not plentiful. The coal market has softened lately due to a lighter demand, and steam coal of fairly good quality lately has been offered as low as $4 per net ton at mines, for mine run grade. Good quality steam coal, however, commands $4.50, while by-product grade is at $5 and gas coal at $5.50 to $6.50.

Old Material.—Further sharp advances have been established since a week ago, partly as a result of purchases by melters, but chiefly because of high prices offered by dealers with contracts with mills in the Youngstown district. Dealers are offering as high as $22.50 for heavy melting steel at Youngstown, and while this is about $1 per ton higher than has been paid by any of the Pittsburgh district plants, $21.50, Midland, Pa., having been done, and fully $2 more than some mills here are offering, it is hard to see how further advances can be prevented here with prices where they are in Youngstown and available supplies still very limited. Dealers still are counting on purchases by Pittsburgh mills at an early date, and their firm position on prices also is ascribable to the wide disparity between scrap and pig iron prices. Evidently little consideration is being given to the fact that as pig iron production increases and steel works and rolling mills activities expand, the steel mills will be less dependent on outside scrap.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel	$21.00 to $21.50
No. 1 cast, cupola size	24.00 to 25.00
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va.; Franklin and Williamsport, Pa.	22.00 to 22.50
Compressed sheet steel	19.00 to 19.50
Bundled sheet sides and ends	17.00 to 17.50
Railroad knuckles and couplers	23.00 to 23.50
Railroad coil and leaf springs	23.00 to 23.50
Low phosphorus standard bloom and billet ends	25.00 to 26.00
Low phosphorus, plates and other grades	23.00 to 24.00
Railroad malleable	18.00 to 18.50
Iron car axles	28.00 to 30.00
Locomotive axles, steel	26.00 to 27.00
Steel car axles	21.50 to 22.00
Cast iron wheels	22.50 to 23.00
Rolled steel wheels	23.00 to 23.50
Machine shop turnings	15.00 to 15.50
Heavy steel axle turnings	17.50 to 18.00
Short shoveling turnings	16.50 to 17.00
Cast iron borings	17.00 to 17.50
Heavy breakable cast	19.50 to 20.00
Stove plate	17.00 to 17.50
Sheet bar crop ends	24.00 to 25.00
No. 1 railroad wrought	17.00 to 17.50

Chicago

Heavy Contracting for Rails—Buying by the Carriers Still Active

CHICAGO, Sept. 19.—The advance to $43 on rails effective Oct. 1 has caused railroads to contract for their needs to get the benefit of the present price. Fully 100,000 tons has thus far been placed and the total may reach 300,000 tons before the month closes. Other advances include $1 a ton on plates, shapes and bars for indefinite delivery, $2 a ton on track spikes and bolts and $3 on light rails. Bookings of a leading mill are somewhat heavier than in recent weeks because of rail orders. On the other hand, the feverish demand for steel for prompt shipment, which was at its height a week or two ago, has abated with the improvement in mill operations. Plates, shapes and bars for three to six weeks' delivery are now available at 2c., Pittsburgh, or 2.34c., Chicago.

Railroad buying continues to be the feature of the market. The carriers are not only buying rails and fastenings but they are placing liberal orders for plates, shapes and bars for car repair work and are letting numerous contracts for bridges. It is notable that while buildings are less numerous among fabricating projects railroad bridge work is accounting for an increasing amount of tonnage. Four railroad bridge awards this week aggregate over 4000 tons. Railroad car building has fallen off very materially, but locomotive purchases are heavy. Car shortage is interfering with shipments of both iron and steel. Present regulations restrict the furnaces and mills to the use of gondola cars with sides under 42 in. in height and do not even permit them to load other equipment in the direction of the coal mines. This difficulty is forcing some mills to revise their rolling schedules to include only such material for which adequate storage space is available.

Production has registered another gain, the Illinois Steel Co. having added one blast furnace each at Gary and South Chicago, giving it a total of 14 active stacks. At the same time, it has increased its steel output to 65 per cent of ingot capacity. The Inland Steel Co. continues on a 65 per cent basis with no prospect of immediate improvement. Merchant blast furnace operations remain unchanged.

Ferroalloys.—An inquiry for 400 tons of spiegeleisen is current. The imminent passage of the tariff bill foreshadows a material advance in ferromanganese. It is probable that some foreign shipments now on the sea will arrive too late to escape the imposition of the duty.

We quote 78 to 82 per cent ferromanganese, future, $75.06; prompt, $82.56, delivered; 50 per cent ferrosilicon, $55 delivered on contract and $65 prompt delivery; spiegeleisen, 18 to 22 per cent, $50, delivered.

Pig Iron.—Merchant furnace operations are unchanged and improvement is delayed by slow deliveries of low volatile coal required for coking. Just how soon the fuel situation will permit the blowing in of additional furnaces cannot be foreseen at this time, but it is hoped that such action will be possible by Oct. 1. Two Iroquois stacks are scheduled to go in before the remaining idle capacity in the district. Demand for prompt iron is active and a considerable number of contracts for fourth quarter have been closed. Current inquiries include 600 tons of foundry for local delivery during fourth quarter, 300 tons of foundry for October and November shipment wanted by a northern Indiana melter and 100 tons of malleable for prompt delivery. A Michigan buyer has closed for 500 tons of malleable for fourth quarter and is still in the market for an equal tonnage. Prices on Northern iron remain unchanged, but Southern foundry has advanced to a minimum of $27 base Birmingham. Shipments from the South show slight improvement, although still very uncertain. Southern iron shipped by barge and rail will again be a factor in this market as the result of failure of the Interstate Commerce Commission to suspend a river and rail rate of $4.18 from Florence and Sheffield, Ala., to Chicago. The company which could take advantage of this rate, however, is not now in the market. Charcoal iron remains unchanged in price and two sales of 250 tons each for fourth quarter shipment are reported. Inquiry for charcoal is active.

Quotations on Northern foundry, high phosphorus malleable and basic irons are f.o.b. local furnace and do not include a switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards, or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$36.15
Northern coke, No. 1, sil. 2.25 to 2.75	33.00
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	32.00
Northern high phos	32.00
Southern No. 2	33.00
Malleable, not over 2.25 sil	32.00
Basic	32.00
Low phos., Valley furnace, sil. 1 to 2 per cent copper free	38.00
Silvery, sil. 8 per cent	46.29

Plates.—Material for indefinite delivery has advanced to a minimum of 2.10c., Chicago, while the best quotation for specific shipment remains 2.30c., Chicago. Demand is still in good volume, although not so pressing as a week or two ago. An Eastern mill is soliciting business in this territory for three to six weeks' delivery at 2c., Pittsburgh, or 2.34c., delivered Chicago. This price appears to be the top of the market.

The mill quotation is 2.10c. to 2.34c., Chicago. Jobbers quote 2.90c. for plates out of stock.

Cast-Iron Pipe.—Prices have advanced to a minimum of $40 base, Birmingham, for 6-in. and larger, and considerable business is moving at higher figures. The United States Cast-Iron Pipe & Foundry Co. has contracts for 1230 tons for Eloise, Mich.; 1750 tons for Laporte, Ind.; 600 tons for Chicago and 188 tons for Milwaukee.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $52.20 to $54.20; 6-in. and above, $48.20 to $50.20; class A and gas pipe, $3 extra.

Bars.—The spread between the minimum and maximum prices on soft steel bars has contracted as a result of an advance of the former and a decline of the latter. The minimum quotation on material for indefinite delivery is now 2c., Chicago, while the best price for specific shipment is 2.10c., Chicago. Bars for three to six weeks' delivery are now being offered by an Eastern mill at 2c., Pittsburgh, or 2.34c., delivered Chicago. This price is now the top of the market. Demand is good, although not so urgent as a week or two ago. New business in bar iron is not equal to mill production, but specifications against contracts are in good volume. Prices are unchanged. Demand for hard steel bars is steady with prices the same and the mills comfortably booked.

Mill prices are: Mild steel bars, 2c. to 2.34c., Chicago; common bar iron, 2.25c. to 2.50c., Chicago; rail steel, 2c. to 2.10c., Chicago mill.

Jobbers quote 2.80c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.80c. for rounds and 4.30c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 2.50c. base; hoops, 3.90c.; bands, 3.55c.

Rails and Track Supplies.—The advance in standard section rails for 1923 delivery effective Oct. 1, is causing many roads to place their orders to get the benefit of the $40 price, thereby effecting a saving of $3 a ton. Fully 100,000 tons has already been placed in Chicago and it is probable that the total will reach 300,000 tons before the end of the month. A considerable quantity of track supplies is being bought with the rails. Standard spikes have advanced to a minimum of 2.85c., mill, and bolts to a minimum of 3.85c., mill, while the plates have gone up to $45 a ton. Light rails have advanced to 2.15c., mill. Inquiry for light rails is active, although orders are not yet heavy.

Standard Bessemer and open-hearth rails, $40; light rails rolled from new steel, 2.15c., f.o.b. makers' mills.

Standard railroad spikes, 2.85c. to 3c., mill; track bolts with square nuts, 3.85c. to 4c., mill; tie plates, steel and iron, 2.25c., f.o.b. mill; angle bars, 2.40c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.50c. base and track bolts 4.50c. base.

Wire Products.—Mill operations are commencing to show considerable improvement, but production is still far behind demand. Mills are experiencing difficulty in taking care of specifications and are accepting new or-

ders only when satisfied that they cover actual needs. No speculative business is wanted. Demand for nails is exceedingly active and business in barbed wire is good. There is an abnormal demand for small track spikes, used largely in coal mines. The leading producer has made no change in prices, while most independents are quoting $3 a ton higher. For mill prices, see finished iron and steel, f.o.b. Pittsburgh, page 755.

We quote warehouse prices, f.o.b. Chicago: No. 9 and heavier black annealed wire and No. 9 and heavier bright basic wire, $3.20 per 100 lb.; common wire nails, $3.35 per 100 lb.; cement coated nails, $2.75 per keg.

Bolts and Nuts.—Buyers are specifying heavily against contracts to get the benefit of the old discounts. Contracts for fourth quarter are being closed at the new prices in considerable number. Ruling discounts are those on page 755 except that the basing point is Chicago instead of Pittsburgh.

Jobbers quote structural rivets, 3.50c.; boiler rivets, 3.60c.; machine bolts up to ¾ x 4 in., 50 per cent off; larger sizes, 50 off; carriage bolts up to ¾ x 6 in., 45 off; larger sizes, 45 off; hot pressed nuts, squares and hexagons, tapped, $2.75 off; blank nuts, $2.75 off; coach or lag screws, gimlet points, square heads, 55 per cent off; quantity extras are unchanged.

Sheets.—Demand is less pressing than recently, but this is explained by the fact that much of the business which was pending has now been placed. The Inland Steel Co. has allocated practically all of its remaining 1922 output. Sales at premiums above the prices of local producers are growing less frequent.

Mill quotations are 3.35c. to 3.50c. for No. 28 black, 2.50c. to 2.60c. for No. 10 blue annealed and 4.35c. to 4.50c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Reinforcing Bars.—Inquiry is unusually active, particularly for small tonnages, ranging from 20 to 60 tons each. Some large jobs also are before the trade, an exceptionally large one being the Spavina water project, Tulsa, Okla., requiring 7500 tons. With an improvement in mill shipments in sight, sellers of concrete bars are taking more interest in new business. Additional inquiries include:

Power plant, Grand Tower, Ill.; 500 tons.

Prince Wells garage, Louisville, Ky.; 250 tons.

Kentucky highway department, bridges, 150 tons, bids to be in Sept. 30.

Oak Park Club, Oak Park, Ill.; 75 tons.

Awards include:

Pine Grove Apartments, Chicago, 265 tons, to Tucson Steel Co.

Foundations for Equitable Life Insurance Building, Des Moines, Ia., 125 tons, to Corrugated Bar Co.

Loyola University gymnasium, Chicago, 100 tons, to Concrete Steel Co.

Illinois Improvement Co., Sanitary District, Chicago, 125 tons, to Concrete Steel Co.

Pullman Co., foundry, Pullman, Ill, 100 tons, to Concrete Steel Co.

Public Service Co. of Northern Illinois, power plant, Waukegan, Ill., 100 tons, to Olney J. Dean.

Steel Castings.—Advances in prices ranging from 15 to 20 per cent, effective Oct. 1, will probably be announced next week.

Structural Material.—Probably two-thirds of the fabricators in this district are operating at capacity and have considerable work ahead with the result that they are not quoting on new work except for extended delivery. Other shops are rapidly getting into the same condition, fabricating awards are still numerous, but there is less new work up for bids. There is no doubt that the advancing season and advancing labor and material costs are discouraging the bringing out of new projects. Demand for plain material is satisfactory, although not so insistent as recently. The minimum price on material for indefinite delivery has advanced to 2.10c., Chicago, while the best quotation for specific shipment is 2.20c., Chicago. An Eastern mill is quoting 2c., Pittsburgh, on three to six weeks' delivery, which is the equivalent of 2.34c., delivered Chicago.

The mill quotation on plain material is 2.10c. to 2.34c., Chicago. Jobbers quote 2.90c. for plain material out of warehouse.

Coke.—The local by-product producer is operating at less than 30 per cent of capacity, having been unable to increase production because of slow deliveries of low volatile coal. It is hoped that the situation will improve by Oct. 1. Prices of local foundry coke remain unchanged. Southern by-product foundry continues to be sold here at the same price, $15, Chicago, as that quoted by Chicago ovens. Sales of fully 25,000 tons were made in this district by one Southern producer during August. The Algona Steel Corporation, Saul Ste. Marie, Ont., has shut down all departments of its plant except one blast furnace because of fuel shortage.

Old Material.—Prices are in the balance, those on some grades being stronger while others have weakened. On the whole, the market has lost the momentum which carried prices up so rapidly in recent weeks and a reaction seems due, although whether it will be of short or long duration is not yet clear. Railroad offerings are no larger than heretofore, but large yard holdings both here and in the country have been placed on the market. Evidently the prospects for further advances are not regarded bright and the present price level is considered a satisfactory one at which to liquidate this material. Whereas this movement is relieving the general shortage of old material, the scarcity of cast scrap is disappearing as a result of weekly offerings of 1500 to 2000 tons from a local Government warehouse. Sensing the possibility of a turn in prices, consumers have largely withdrawn from the market and trading is between dealers. Railroad lists include the Santa Fe, 500 tons, and the Northern Pacific, 800 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$25.00 to $25.50
Cast iron car wheels	24.50 to 25.00
Relaying rails	27.50 to 32.50
Rolled or forged steel car wheels	22.50 to 23.00
Rails for rolling	19.50 to 20.00
Steel rails, less than 3 ft	21.50 to 22.00
Heavy melting steel	18.00 to 18.50
Frogs, switches and guards cut apart	18.00 to 18.50
Shoveling steel	17.75 to 18.25
Drop forge flashings	12.50 to 13.00
Hydraulic compressed sheet	15.00 to 15.50
Per Net Ton	
Iron angles and splice bars	22.50 to 23.00
Steel angle bars	18.50 to 19.00
Iron arch bars and transoms	22.50 to 23.00
Iron car axles	25.50 to 26.00
Steel car axles	19.50 to 20.00
No. 1 busheling	15.00 to 15.50
No. 2 busheling	10.00 to 10.50
Cut forge	17.00 to 17.50
Pipes and flues	12.50 to 13.00
No. 1 railroad wrought	17.50 to 18.00
No. 2 railroad wrought	17.00 to 17.50
Steel knuckles and couplers	19.50 to 20.00
Coil springs	21.50 to 22.00
No. 1 machinery cast	21.00 to 21.50
No. 1 railroad cast	19.50 to 20.00
Low phos. punchings	17.00 to 17.50
Locomotive tires, smooth	17.50 to 18.00
Machine shop turnings	10.50 to 11.00
Cast borings	13.00 to 13.50
Stove plate	17.00 to 17.50
Grate bars	17.50 to 18.00
Brake shoes	17.50 to 18.00
Railroad malleable	22.00 to 22.50
Agricultural malleable	22.00 to 22.50

Reduced Rail Rate Asked for Imported Iron

WASHINGTON, Sept. 19.—Application was made to the Interstate Commerce Commission to-day by the Chesapeake & Ohio Railroad to establish low rates on short notice on imported pig iron from Newport News, Va., to Lynchburg and Richmond, Va. The application seeks to publish a rate of $2.25 per gross ton to Lynchburg and $1.50 to Richmond, with a minimum of 20 tons. The carrier explained the application on the ground that a ship is expected soon at Newport News with a cargo of pig iron which could not be distributed profitably by the importers because the domestic rates from the port are too high. The rate of $2.25 to Lynchburg was proposed, it is stated, because that is the rate from Reusens, Va., 4 miles beyond Lynchburg, to Newport News for export or coastwise shipments. The rate from Reusens, it was pointed out, had been established by the Norfolk & Western, which was represented as having acquiesced in the proposal to establish the import rates named on short notice.

New York

Large Tonnages of Rails Under Negotiation — Serious Car Shortage

NEW YORK, Sept. 19.—Transportation problems continue to be very serious. The car shortage is pronounced and deliveries, particularly from the South, are extremely slow. In some cases, the delivery of pig iron has been delayed fully a month.

Pig Iron.—The week has been one of rather numerous transactions in domestic irons, but the volume of business has not been large. The largest purchase was by the American Locomotive Co., which took 1500 tons of foundry grades and 500 tons of charcoal for immediate delivery and is now in the market for 700 tons of charcoal. A stove manufacturer at Port Chester, N. Y., bought two 500-ton lots of foreign iron. Inquiries include one for 300 tons of No. 1 iron for last quarter delivery from a New England melter; 150 tons for the General Electric Co.; 200 tons for the American Car & Foundry Co., and 500 tons for a range manufacturer. Makers of Scotch iron are not able to sell for delivery earlier than November, but there is still some of this iron in the hands of brokers in this country. The price ranges from $30 to $32. On French, Belgian and other continental iron averaging from 2.50 to 3 per cent silicon prices range from $26.50 to $28 c.i.f. New York. On domestic irons, some sales are being made on a basis of $32 for No. 2 plain and others on a basis of $33.

We quote delivered in the New York district as follows, having added to furnace prices $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$36.27 to $37.27
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	35.27 to 36.27
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	34.27 to 35.27
Buffalo, sil. 1.75 to 2.25	37.91 to 38.91
No. 2 Virginia, sil. 1.75 to 2.25	No sales

Ferroalloys.—Demand for ferromanganese is not so active as it has been during the last two months but moderate sales have been made. At least 2500 to 3000 tons of British alloy have been sold, part for October and part for November shipment. Quotations are unchanged at $67.50, seaboard. There is also a moderate inquiry. There have also been sales of moderate quantities of spiegeleisen, both domestic and foreign, at $38 to $39, seaboard or furnace, for early delivery. Quotations for manganese ore are unchanged but nominal. A statement is made that British blast furnaces are running at full capacity on ferromanganese and that a scarcity of ore is feared due partly to the trouble in the near East. Practically all sellers of both domestic and imported 50 per cent ferrosilicon are on a $65, delivered, basis. Moderate sales have been made at this level and specifications on contract are very good. Imported 14 to 16 per cent electric ferrosilicon is quoted at $42, delivered. The market for ferrochromium is moderately active with the quotation for the 4 to 6 per cent carbon variety at 12c. per lb., delivered.

Ferromanganese, domestic, seaboard, per ton	$67.50
Ferromanganese, British, seaboard, per ton	$67.50
Spiegeleisen, 17 to 19 per cent, furnace	$38.00
Spiegeleisen, 20 per cent, furnace	$38.00 to $39.00
Ferrosilicon, 50 per cent, delivered, per gross ton, carloads	$57.50 to $65.00
Ferrosilicon, 10 to 15 per cent, delivered, per gross ton	$38.00 to $40.00
Ferrotungsten, per lb. of contained metal	40c. to 50c.
Ferrochromium, 4 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr., delivered	12c. to 14c.
Ferrovanadium, per lb. of contained vanadium	$3.50 to $4.00
Ferrocarbontitanium, 15 to 18 per cent, in carloads, per net ton	$200.00

Ores

Manganese ore, foreign, per unit, seaboard	28.50c. to 29.50c.
Tungsten ore, per unit, in 60 per cent concentrates, nominal	$3.50 up
Chrome ore, basis 48 per cent Cr_2O_3, crude, per ton, Atlantic seaboard	$18.00 to $18.50
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	45c. to 50c.

Cast-Iron Pipe.—The season of intense activity in purchasing of pipe is drawing to a close and few municipal tenders are now noted. Makers are operating full time and find the shortage of raw materials much less acute. Deliveries are still extended and prices are strong. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $54.50; 4-in. and 5-in., $59; 3-in., $64.80, with $4 additional for Class A and gas pipe.

Finished Iron and Steel.—The stiffening price situation of the last few weeks seems to be resulting in a large amount of orders against contracts. Buying for fresh enterprises is relatively dull as it was a week ago. The conspicuous development is negotiation by railroads for rail needs of the first half of 1923, to secure the $40 per ton price before the advance to $43 becomes effective on Oct. 1. Among rail inquiries are 200,000 tons for the New York Central (125,000 at the outset, 25,000 tons on a March 1 option and 50,000 tons on a June 1) option, 25,000 tons for the Norfolk & Western and 8000 tons for the Long Island. Price ranges on plates, bars and shapes are narrowing. The leading interests appear to be quoting 1.90c. and 2c. on the heavy tonnage products and probably only one independent company remains asking 2.50c., Pittsburgh, for plates. Prices generally range between 2c. and 2.25c. with large lots of bars obtainable for relatively early delivery at 2c. to 2.10c.; beams at 2c. to 2.15c. and plates 2.15c. to 2.25c. There is a feeling that the cost of the strike to the railroads may reduce the volume of their purchases for the remainder of the year and that the present lull in new inquiries results from a feeling that we are entering an area of inflation which is calculated to stop new enterprises. These two views are calculated to have opposite effects on the price situation and the present indications point to a more or less stationary level of prices forced by the definitely increased costs of steel manufacture.

We quote for mill shipments, New York delivery, as follows: For indefinite delivery, soft steel bars, structural shapes and steel plates, 2.24c. to 2.34c.; for delivery in a number of weeks, soft steel bars and plain structural material, 2.34c. to 2.59c.; steel plates, 2.49c. to 2.59c.; bar iron, 2.59c.

Warehouse Business.—Although prices are unchanged, warehouses in this district are again looking forward to a slight advance in quotations on bars, structural material and plates. The present warehouse quotations are based upon the Steel Corporation schedule, but the higher prices charged by the independent mills are believed to warrant a further advance. Sheet prices are said to be firm, but quotations cover a wide range, from 4.50c. and 5.50c. per lb., base on black and galvanized, the quotation of some warehouses on large lots from stock, to 4.90c. and 5.90c. per lb., base, the schedule being maintained by the leading independent and other iron and steel warehouses here. Selling of blue annealed sheets on a 3.93c. per lb. basis is reported. On wrought iron and steel pipe, warehouses, following an advance by the makers, have increased prices about $12 per ton and report business good. There is no change in brass and copper warehouse quotations. We quote prices on page 778.

High Speed Steel.—While the market is quiet, prices continue firm at about 75c. per lb. for 18 per cent tungsten, the quotation of most producers, with special brands of some companies ranging up to 90c. per lb.

Coke.—The coke market is firmer than it was a few days ago. The quotations are slightly higher, furnace coke being quoted at $11 to $12, Connellsville ovens and foundry at $14 to $14.50, while by-product is still quoted at $14 seaboard.

Old Material.—The market continues to move upward, heavy melting steel being quotable at $13 to $13.50 per ton this week compared with a price of $11.50 to $12 per ton last week. Dealers, as a rule, state that there is no evidence of weakening in the price situation. Railroad steel is stronger this week at $13.75 to $14.25 per ton and specification pipe is quoted at $11.75 to $12.25 per ton. Buying by mills is general and tonnages are fairly large. The Bethlehem Steel Co. and the Alan Wood Iron & Steel Co. are both pay-

ing $17 per ton for heavy melting steel and it is stated that the Midland plant of the Pittsburgh Crucible Steel Co. is in the market for a heavy tonnage.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard	$13.00 to $13.50
Steel rails, short lengths, or equivalent	13.75 to 14.25
Rerolling rails	13.75 to 14.25
Relaying rails, nominal	27.00 to 28.00
Steel car axles	17.00 to 18.00
Iron car axles	23.00 to 24.00
No. 1 railroad wrought	15.00 to 15.50
Wrought iron track	12.75 to 13.25
Forge fire	10.00 to 10.50
No. 1 yard wrought, long	13.00 to 13.50
Cast borings (clean)	11.50 to 12.00
Machine-shop turnings	10.75 to 11.25
Mixed borings and turnings	10.75 to 11.25
Iron and steel pipe (1 in. diam., not under 2 ft. long)	11.75 to 12.25
Stove plate	12.00 to 12.50
Locomotive grate bars	12.00 to 12.50
Malleable cast (railroad)	13.00 to 13.50
Cast-iron car wheels	13.50 to 14.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast	$19.50 to $20.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	17.00 to 17.50
No. 1 heavy cast, not cupola size	14.50 to 15.00
No. 2 cast (radiators, cast boilers, etc.)	13.00 to 13.50

Boston

Largest Number of Orders for Foreign Iron Noted This Year Are Placed

BOSTON, Sept. 19.—The past week witnessed a larger number of individual orders placed in this territory for foreign iron than in any previous similar period this year. A few 500-ton lots were purchased, but nothing larger. From that amount, tonnages, ran down to carlots, aggregate bookings being estimated at 4000 to 5000 tons, largely fourth quarter delivery. No sales for first quarter, 1923, delivery are reported. Scotch iron continues the most, Continental the next and English the least active. No. 3 Scotch sold at $30 to $31 c.i.f. dock Philadelphia and $32 dock here, Belgian high phosphorus at $26 and phosphorus and manganese 0.60 to 0.80 at $26.50 c.i.f. dock, while French fetched slightly better prices. English iron sold at $27 to $29 on cars, dock. About 2000 tons of domestic iron, Alabama at $28 furnace base and Virginia at $32 furnace base, and 200 tons of malleable, the market for which is $34 furnace, are included in the week's transactions. Sellers of foreign iron report greater difficulty in securing cars in which to make local shipments. Most cars available are in poor order and are loaded far below capacity. Instances are cited where as little as eight tons have been loaded.

We quote delivered prices, on the basis of the latest reported sales, now infrequent, and as follows, having added to furnace prices $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75	$36.15 to $38.15
East. Penn., sil. 1.75 to 2.25	35.65 to 37.65
Buffalo, sil. 2.25 to 2.75	39.41 to 41.41
Buffalo, sil. 1.75 to 2.25	38.91 to 40.91
Alabama, sil. 2.25 to 2.75	38.10
Alabama, sil. 1.75 to 2.25	37.60
Virginia, sil. 2.25 to 2.75	38.92
Virginia, sil. 1.75 to 2.25	37.92

Warehouse Business.—Recently advanced prices on iron and steel are firmly maintained, with the movement out of warehouses on the increase, Local stocks of small sizes of bars, flats, concrete bars, etc., continue broken, shipments from the mills still being backward. Substitution of iron for steel bars is noted in certain sizes. The higher prices for bolts and nuts, put into effect recently, has stimulated rather than hurt business. Small rivets have again advanced, now being quoted at 50 per cent discount, as against 50 and 10 per cent, heretofore. Wood screws are approximately 2½ points higher.

Jobbers quote: Soft steel bars, $3.25 per 100 lb. base; flats, $3.85; concrete bars, $3.25; structural steel, $3.25 to $3.50; tire steel, $4.50 to $4.85; open-hearth spring steel, $5 to $6.50; crucible spring steel, $12; steel bands, $4.25; hoop steel, $4.75; cold rolled steel, $4 to $4.50; refined iron, $3.25; best refined iron, $4.50; Wayne iron, $5.50; Norway iron, $6 to $6.50; plates, $3.35 to $3.55; No. 10 blue annealed sheets, $4.15 per 100 lb. base; No. 28 black sheets, $5.40; No. 28 galvanized sheets, $6.40.

Finished Material.—Slightly more activity is noted in construction, but individual tonnages of structural steel required in most cases are small. The Edison Co.'s requirements for its South Boston plant addition, approximately 950 tons, is expected to be placed this week. Bids have been asked on 235 tons for a Lowell. Mass., bridge by Fay, Spofford & Thorndike, Boston engineers. Mills report a better demand for plain material from shipyards and structural steel concerns. Warehouse supplies apparently are in good condition. The demand for plates is active in point of number of orders received, but aggregate tonnages are small. The plate market here is 2¼c. to 2½c., Pittsburgh. The city of New York has placed an order for 15 trackless trolley cars, costing $12,000 each, with the Osgood-Bradley Car Co., Worcester, Mass.

Coke.—Both the New England Coal & Coke Co. and the Providence Gas Co. are making freer shipments of by-product foundry coke on contract, notwithstanding increased demands upon them due to a larger aggregate melt in this territory. New England foundries therefore show less interest in foreign and in Alabama fuel, but firms handling these cokes have no difficulty in disposing of stocks in transit and due to arrive, to public utilities, coal dealers, etc. Although New England coke producers are making a better showing on contracts, they remain practically out of the market for spot business. Connellsville foundry coke sold in carlots the past week, first at $14.50 ovens, and subsequently at $12.50, the latter price representing slightly better than $18 delivered, contrasted with $16.50 delivered for New England by-product fuel.

Old Material.—The market is more active than noted in some time, possibly two years or so. Greater activity would exist, were the car supply better, dealers being forced to exercise more or less caution in making purchases because railroads cannot guarantee cars. The better demand, coupled with a limited supply of certain materials, caused an appreciable strengthening in values the past few days, the market bordering on a runaway affair. For shipment to the Pittsburgh district, $14 shipping point is the common offer for heavy melting steel, whereas early in the week $11 was paid for shipment to eastern Pennsylvania. As high as $14 shipping point is offered for No. 1 yard wrought for eastern Pennsylvania delivery. The last actual business put through was at $13.50. No. 1 railroad wrought easily commands $15 to $15.50 shipping point, 50c. a ton more than a week ago. Car wheels and bundled skeleton have jumped $1 a ton, and rerolling rails and shafting are 50c. dearer. Dealers paid $9 shipping point for cotton ties for eastern Pennsylvania consumption. Prices on machine shop turnings take a wider range than heretofore. If suitable for rolling mills, $11 usually is bid, otherwise the market is 50c. a ton or more less. The best bid reported on chemical borings is $15.50 shipping point, $1.50 higher for the week. Actual sales of borings, steel turnings and mixed borings and turnings are limited, however, due to their scarcity. One local melter offers $10 shipping point for steel turnings, but New England consumers of old material in most cases have withdrawn from the market. Inquiry for machinery cast is on the increase, with prices easily $1 higher and no increase in tonnage coming out. A sale of No. 1 and No. 2 mixed machinery cast, the first reported in several months, at $17.50 delivered New England is noted.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$21.00 to $22.00
No. 2 machinery cast	19.00 to 20.00
Stove plate	16.00 to 16.50
Railroad malleable	16.00 to 16.50

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$13.50 to $14.00
No. 1 railroad wrought	15.00 to 15.50
No. 1 yard wrought	13.00 to 13.50
Wrought pipe (1 in. in diam., over 2 ft. long)	9.75 to 10.25
Machine shop turnings	9.75 to 11.00
Cast iron borings, rolling mill	10.50 to 11.00
Cast iron borings, chemical	14.00 to 15.50
Blast furnace borings and turnings	9.75 to 11.00
Forged scrap and bundled skeleton	10.00 to 10.50
Street car axles and shafting	18.50 to 19.50
Street car wheels	16.00 to 16.50
Rerolling rails	13.00 to 13.50

Cincinnati

Southern Iron Advances $2—Conditions Improve Very Slowly

CINCINNATI, Sept. 19.—While there were a few round tonnage lots disposed of during the past week, the market as a whole was quiet, and little inquiry is now before the trade. The lull in buying is accounted for by the feeling on the part of melters that with the railroad strike on the verge of being settled, iron will move more freely, and shipments now under contract will come through. The situation in the South, while showing some improvement, still remains very much unsettled, as some roads serving the iron producing centers are not parties to the settlement, and the settlement of the Southern Railway has not yet had any effect. Though buying is light, prices remain very firm, and Southern iron is at least $2 a ton higher at $27, Birmingham base, with some furnaces asking $28 to $30. Some tonnage was booked early in the week at $25, but this price has been withdrawn, and the interest making it is understood to be holding for $27.50. In the North $32 is the minimum figure at which iron can be purchased, and in some districts $36 has been quoted. More important sales during the week included one of 5000 tons of malleable to a northern Ohio interest from a Lake furnace, and 1500 tons of foundry to a central Ohio melter, both sales being reported at $32. An Indiana melter bought 500 tons of malleable from a Chicago district furnace at $32, furnace, and a sale of foundry iron was made to an Indiana stove manufacturer on the same basis. Two sales of silvery iron, 300 tons each, were made at $41.50 for 8 per cent. A sale of basic, estimated at 10,000 tons, is reported to have been made by a Southern interest to a Middle Western steel manufacturer on the basis of $27, Birmingham. Jisco furnace at Jackson will blow in on Sept. 25 on silvery, and Belfont furnace at Ironton on Bessemer during the present week.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$31.05
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	31.55
Ohio silvery (nominal), 8 per cent.	43.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	34.27
Basic Northern	32.27
Malleable	34.27

Finished Material.—An increasing demand for finished materials is evident, and the aggregate tonnage booked last week was fully up to the average set before the rail and coal strikes slowed up general business conditions. While the orders generally were from carload lots to 200 tons, several of 500 tons are reported, and one for 1000 tons of plates was placed by a safe manufacturer. Several 500-ton shape inquiries are current, and a car manufacturer is in the market for 1500 tons of plates for car repair work. A spring manufactuer is also inquiring for 500 tons of spring steel for fourth quarter. The demand for sheets is being steadily maintained, and independent mills continue to quote for October delivery only. Prices on sheets continue to range from 2.50c. to 2.75c. for blue annealed, 3.35c. to 3.75c. for black, and 4.35c. to 4.75c. for galvanized. On automobile body sheets, the range to-day is 4.75c. to 5c. It is expected that tin plate prices will be advanced shortly to approximately $5 per base box. The demand is expected to be heavy, particularly from the Northwest, where a great part of the fruit crop was left on the ground this year owing to failure on the part of container manufacturers to supply sufficient cans to take care of it. On bars and plates, 2.25c. is easily done, as most of the orders placed this week were at this figure. Bars, however, were available in the early part of the week at 2.15c. for rather indefinite delivery. Plate prices are very firm at 2.25c. Shapes, however, continue to lag for some unexplainable reason, and 2c. can still be done from several independent mills. Wire prices generally are up approximately $3 per ton, and we note a sale of 100 tons of plain wire at $2.50 per 100 lb. Nails are firm at $2.50 to $2.75, per keg, base, and while most of the jobbers are covered by contracts at the lower figure, sales are now being made at the higher price. There is a fair demand for track fastenings, particularly small spikes, but light rails are inactive. The demand for pipe is steady. A number of fair-sized awards were made in the structural field, but new inquiries are few.

Warehouse Business.—Local jobbers continue to report a good volume of business. Inability of mills to secure cars in which to make shipments is proving a boon to the warehouse trade, and stocks, as a result, are moving very fast. The number of inquiries from outside the Cincinnati district is steadily increasing, and bids fair to continue. There have been no further price changes, and jobbers do not expect further advances.

Cincinnati jobbers quote: Iron and steel bars, 2.95c. base; reinforcing bars, 3.05c. base; hoops, 4.05c. base; bands, 3.85c. base; shapes and plates, 3.05c. base; cold-rolled rounds, 3.75c. base; cold-rolled flats, squares and hexagons, 4.25c. base; No. 10 blue annealed sheets, 4c.; No. 28 black sheets, 4.70c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, $2.85 per 100 lb.; common wire nails, $3.05 per keg, base.

Tool Steel.—A slight improvement in the demand for tool steel is noted, but orders are largely of the hand to mouth variety. However, with the railroad strike settled and prospects of increasing activity among local manufacturing plants, a better demand for tool steel is expected. Prices are unchanged, high speed steel being generally quoted at 70c. per lb., base.

Coke.—There is little activity in the coke market, though prices are holding very firm. Inquiry is light. Most producers have a comfortable order book. Production is not increasing to any extent in New River or Wise County, as difficulty is still being experienced in moving coal. Prices are unchanged from last week.

Old Material.—The scrap market was very active during the early part of the week, and prices moved up sharply on some grades, but offerings by the smaller dealers had the effect of softening the market, and as a result prices lost most of their gain. There is still a good demand for cast grades, and steel plants outside the district are inquiring for blast furnace and rolling mill grades. Many plants that have been embargoed are now open, and scrap is moving in fair volume. Offerings by producers are light. Prices are not quotably changed.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

	Per Gross Ton	
Bundled sheets	$9.50 to	$10.00
Iron rails	15.50 to	16.00
Relaying rails, 50 lb. and up	26.50 to	27.00
Rails for rolling	14.50 to	15.00
Heavy melting steel	15.00 to	15.50
Steel rails for melting	14.00 to	14.50
Car wheels	17.00 to	17.50
	Per Net Ton	
No. 1 railroad wrought	13.50 to	14.00
Cast borings	10.50 to	11.00
Steel turnings	9.50 to	10.00
Railroad cast	16.00 to	16.50
No. 1 machinery	19.50 to	20.00
Burnt scrap	10.50 to	11.00
Iron axles	19.50 to	20.00
Locomotive tires (smooth inside)	12.50 to	13.00
Pipes and flues	7.50 to	8.00

Buffalo

Blast Furnace Operations Increased by Two Stacks—Sales Light

BUFFALO, Sept. 19.—Furnace operation in this district is strengthened by the addition of two stacks this week. The Donner Steel Co. is placing one stack in blast to run on basic iron and the Hanna Furnace Co., operating the Buffalo Union plant, is placing a foundry iron furnace in operation. This operation is not due to any increased demand, but the fuel situation is more encouraging and contracts now on the books call for this addition to active stacks. Sales and inquiry are extremely light. The only furnace having merchant iron for sale has sold tonnages of No. 2 plain at $33 and ranging from that figure to $35. Sales are scattered and none of the large consumers is in the market. There is not enough activity at present to have any effect on the present schedule of prices. One interest which has occasional lots of high silicon iron for its regular trade has sold carload lots of silicon 3.25 to

3.75 at $38 and silicon 3.75 to 4.25 at $39, but these transactions were for immediate coverage of urgent needs. The American Locomotive Co. inquiry for 1400 tons has not been filled in the Buffalo district up to date.

We quote f.o.b. per gross ton Buffalo as follows, the higher prices being for early shipment:

No. 1 foundry, 2.75 to 3.25 sil.	$35.00 to $36.00
No. 2X foundry, 2.25 to 2.75 sil.	34.00 to 35.00
No. 2 plain, 1.75 to 2.25 sil.	34.00 to 34.50
Basic	34.00
Malleable	36.00
Lake Superior charcoal	36.28

Warehouse.—Heavy bars are in especial demand at warehouses and all products generally are moving briskly. The unusual call for bars of large sizes is due to the fact that mills are not rolling these sizes. Certain sizes in mills are difficult to buy.

Finished Iron and Steel.—Several sellers are able to take bar business on a wider plane than has existed in this vicinity since last spring, but the situation is far from normal. Demand is unabated for practically all products and sheet business is especially brisk. The leading local sheet maker is quoting 3.50c. base for No. 28-gage blacks and all quotations are for delivery at convenience of the mill. A local bar maker quoting a minimum price of 2.15c. is booking considerable business—as much as it can turn out. The maximum quotation by this maker is 2.25c. Some attractive 300 and 400-ton loads have been booked.

We quote warehouse prices, Buffalo, as follows: Structural shapes, 3.10c.; plates, 2.90c.; soft steel bars, 3c.; hoops, 4c.; bands, 3.80c.; blue annealed sheets, No. 10 gage, 3.90c.; galvanized steel sheets, No. 28 gage, 5.85c.; black sheets, No. 28, 4.85c.; cold rolled round shafting, 3.95c.

Old Material.—Heavy melting steel and other products have been advanced in price brought about by a very active demand by all the mills. Dealers, however, are reluctant to sell, believing that heavy melting steel will go higher, some estimating that it will touch the $25 mark before long. Higher prices prevail outside the district. Government restriction on the use of coal cars is seriously interfering with the movement of scrap. There is a pronounced shortage in the production of cast iron borings and machine shop turnings.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel	$18.00 to $18.50
Low phos., 0.04 and under	20.00 to 21.00
No. 1 railroad wrought	18.00 to 19.00
Car wheels	21.00 to 22.00
Machine shop turnings	13.50 to 14.50
Cast iron borings	15.00 to 16.00
Heavy axle turnings	16.50 to 17.50
Grate bars	15.50 to 16.00
No. 1 busheling	16.00 to 16.50
Stove plate	16.50 to 17.00
Bundled sheet stampings	12.50 to 13.00
No. 1 machinery cast	20.00
Hydraulic compressed	16.50 to 17.00
Railroad malleable	19.50 to 20.00

Birmingham

Very High Prices Obtained for Limited Tonnages of Pig Iron

BIRMINGHAM, ALA., Sept. 19.—Sales in the Birmingham pig iron market last week included 1000 tons for a pipe maker at $27 and numerous lots of 200, 300, 400 tons at $27.50 and $28. As high as $29.50 base was gotten on a special grade of iron. Total sales approximated 4000 tons in addition to what may have been made of Alabama iron stored at Providence, R. I. The largest foundry maker withdrew from the market at beginning of the week and that left all selling foundry makers quoting and selling at not under $27.50. It is claimed that reports of $25 Birmingham iron sales made last week were based on business done the week before and not during the current week in which reported. The car situation is still very bad and deliveries are slow and uncertain. The inquiry during the week was not especially active and large pipe makers have been especially quiet. Only one maker has much unbooked tonnage for this year. The Tennessee company will blow in its No. 1 furnace at Ensley this week. It has been rebuilt and enlarged and its stated capacity is 550 tons, but it will probably average much more than that, one small stack at Ensley having attained a production of 600 tons a day. The company having consumed all the basic iron on hand last month as well as the make of six furnaces, will probably blow in No. 1 on basic. The Central Iron & Coal Co. has advanced wages of furnace, mine and pipe shop workers 20 per cent effective Sept. 1 in line with advances made by other operators. The Southern melt has been curtailed to an extent by difficulty in securing pig iron on account of the car shortage, but, so far as this allows, iron-using plants are very close to a 100 per cent turn.

New Freight Rates

The lower rates to St. Louis, Chicago and Iowa points on Sheffield and Florence iron of the Sloss-Sheffield Steel & Iron Co. published by the Arrow Transportation Co. and the Burlington system were allowed by the Interstate Commerce Commission and went in effect Sept. 15. They are: To St. Louis, $3.28 vs. former rate of $3.85; to Chicago, $4.18 vs. former rate of $4.99. It is expected that other roads will come to the position of the Burlington. The Sloss-Sheffield Steel & Iron Co. will load 2000 tons of northern Alabama iron for delivery by this route during the week.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	$27.00 to $28.00
Basic	27.00 to 28.00
Charcoal, warm blast	33.00 to 34.00

Cast Iron Pipe.—The pipe markets have been quieter. Sanitary pipe jobbers are holding off pending reception of some of their numerous consignments somewhere in transit. The United States Cast Iron Pipe & Foundry Co. took 800 tons for Detroit and smaller tonnages for Southern municipalities. Its production at Anniston and Chattanooga has been curtailed through irregular shipments of iron. The De Lavaud pipe has not yet figured in contracts entered into. The pressure base is $40 and sanitary base $60 to $65.

Finishing Mills.—The South has a new car building plant, the Virginia Bridge & Iron Co. having completed its car making adjunct to its structural steel works in Birmingham and secured these initial contracts: Rebuilding 500 composite cars for the Seaboard Air Line, rebuilding 500 steel hopper cars for the Central of Georgia Railroad and building 100 steel flat cars for the latter. The Tennessee company's double turn schedule in finishing mills is continued and independent steel plants are on full turn in finishing departments. The Tennessee company shipped 3000 tons of sulphate of ammonia, 500 tons of pig iron and 3000 tons of steel rails and track accessories to Yokohama, Kobe, Shanghai and Chemulpo out of Mobile last week.

Old Material.—The scrap market has been very excited on nervous jumps up and down, mostly up, but does not know just how to mark up. Yard men are slow in closing large contracts on expectancy of hardening of new base prices.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails	$17.00 to $19.00
No. 1 steel	16.00 to 18.00
No. 1 cast	18.00 to 20.00
Car wheels	18.00 to 20.00
Tramcar wheels	17.00 to 19.00
Stove plate	16.00 to 17.00
Cast-iron borings	8.00 to 9.00
Machine shop turnings	9.00 to 10.00

Scrap Advances at Detroit

DETROIT, Sept. 19.—Advances have been recorded on practically all grades of scrap with automobile cast leading the list. This material is much in demand and sales have been made as high as $25.00 per net ton. Hydraulic compressed registered an advance of $1.50 per ton and No. 1 machinery cast advanced $2.00 per ton. The following prices are on a gross ton basis f.o.b. cars producers' yards, excepting stove plate, automobile and No. 1 machinery cast, which are quoted on a net ton basis:

Heavy melting steel	$15.50 to $16.00
Shoveling steel	14.75 to 15.75
No. 1 machinery cast	17.50 to 18.50
Cast borings	12.00 to 13.00
Automobile cast scrap	24.00 to 25.00
Stove plate	14.50 to 16.00
Hydraulic compressed	14.50 to 15.50

St. Louis

Inquiries for 13,500 Tons of Basic—Southern Prices Higher

ST. LOUIS, Sept. 19.—The pig iron market is particularly strong, with more orders placed than during the preceding week. A number of melters are seeking iron for immediate shipment, and more interest is being shown in prompt-shipment iron than in future shipments. The market is unchanged on Northern iron at $32 f.o.b., Chicago, while the market on Southern iron has advanced to $27 to $28, f.o.b., Birmingham. A shipment of 1200 tons of Southern iron made at Sheffield was moved by water to Metropolis, Ill., thence by rail to St. Louis during the week, and an additional sale by the same maker for St. Louis shipment totaled several hundred tons during the week. A few cars moved by all-rail from Birmingham via the Louisville & Nashville Railroad. The principal transaction of the week of the Granite City maker was the sale of 1,000 tons of foundry iron to an East Side melter and various lots ranging from 100 to 200 tons and totalling about 800 tons of low silicon iron, which were taken in the absence of standard grades which were not available. A number of melters are negotiating for additional tonnages without sending out inquiries. The principal inquiry before the market is for 10,000 tons of basic for melt at a point outside of the territory usually covered by the St. Louis maker, and 3500 tons of basic to another point outside the territory. Many melters are seeking high silicon iron, which is not available from the Granite City maker.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago and $5.17 from Birmingham and 81 cents average switching charge from Granite City:

Northern foundry, sil. 1.75 to 2.25	$32.16
Northern malleable, sil. 1.75 to 2.25	32.16
Basic	32.16
Southern foundry, sil. 1.75 to 2.25	$32.17 to 33.17

Finished Iron and Steel.—Reports from steel mills tell of improvement in production conditions, and concerns that have been out of the market are now looking for "desirable" business. But orders are not so plentiful. Steel ordered now can hardly be delivered until November or December, and jobbers, especially, are not inclined to buy for such deliveries. The principal railroad item is the inquiry of the Missouri-Kansas-Texas Railroad for 10,000 tons of 90-lb. rails for delivery next August, and it is understood that it is having difficulty in placing the business at present prices for delivery so far off. The St. Louis & San Francisco bought 500 tons of plates at better than $2.25, Pittsburgh. The Missouri Pacific Railroad bought 1,000 kegs of track spikes and the Mobile & Ohio 900 kegs. It is expected that bids will be asked this week on the new building of the Broderick & Bascomb Rope Co., involving a considerable tonnage of re-inforcing bars.

For stock out of warehouse we quote: Soft steel bars, 2.90c. per lb.; iron bars, 2.90c.; structural shapes, 3c.; tank plates, 3c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, cold rolled, one pass, 4.85c.; cold drawn rounds, shafting and screw stock, 3.90c.; structural rivets, 3.60c. per 100 lb.; boiler rivets, 3.70c.; tank rivets, ⅞ in. and smaller, 60 per cent off list; machine bolts, large, 50 and 10 per cent; smaller, 50-10 and 10 per cent; carriage bolts, large, 55-5 per cent; small, 60 and 10 per cent; lag screws, 60 per cent; hot pressed nuts, square or hexagon blank, $3.50; and tapped, $3.25 off list.

Coke.—The demand for coke is steadily increasing, with the call for domestic coke overwhelming. The Granite City by-product foundry coke is quoted at $14.00 at the furnace, but the company has withdrawn from the market. Coal is moving very poorly into this market.

Old Material.—The market for old material has advanced considerably during the week, which was featured by heavy purchases. The Scullin Steel Co., National Enameling & Stamping Co., and the American Steel Foundries are reported to have bought 15,000 tons each, while the Helmbacher Forge & Rolling Mills Co. bought 10,000 tons. No old material is coming in, and users are relying entirely upon the local yards, whose stocks are almost depleted. One of the largest yards in the district has sold all of its stock on hand.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton

Old iron rails	$20.50 to $21.00
Rails for rolling	20.75 to 21.25
Steel rails, less than 3 ft	20.00 to 20.50
Relaying rails, standard section	26.00 to 29.00
Cast iron car wheels	24.50 to 25.00
No. 1 heavy railroad melting steel	18.50 to 19.00
No. 1 heavy shoveling steel	18.00 to 18.50
Ordinary shoveling steel	18.00 to 18.50
Frogs, switches and guards cut apart	20.00 to 20.50

Per Net Ton

Heavy axles and tire turnings	12.75 to 13.25
Steel angle bars	18.00 to 18.50
Iron car axles	26.00 to 26.50
Steel car axles	20.50 to 21.00
Wrought iron bars and transoms	20.50 to 21.00
No. 1 railroad wrought	17.50 to 18.00
No. 2 railroad wrought	17.00 to 17.50
Railroad springs	21.00 to 21.50
Steel couplers and knuckles	21.00 to 21.50
Cast iron borings	11.00 to 11.50
No. 1 busheling	13.50 to 14.00
No. 1 railroad cast	21.50 to 22.00
Railroad malleable	19.75 to 20.25
Machine shop turnings	9.50 to 10.00

San Francisco

Mild Interest in Foreign Pig Iron—Effects of Strikes Seen in Finished Materials

SAN FRANCISCO, Sept. 19.—The pig iron market along the Coast continues rather quiet. There is a moderate interest in foreign offerings, which at the moment are abundant, but the volume of sales recently has not been large. It appears that consumers have about taken their requirements for the time being, and under present conditions do not feel sufficiently secure of the trend to warrant liberal purchasing. Moreover, steamer space from England is available only in very limited amount during September and October. What little new business was reported, perhaps around 500 tons for San Francisco and Los Angeles, was transacted on a basis of close to $29, ex-ship, coast ports. It is understood there are a few offerings in the market at present for material analyzing 1.75 to 2.25 silicon, 0.05 sulphur, 0.020 to 0.040 phosphorus and 0.08 to 0.10 manganese, at around $27, c.i.f., San Francisco. Very high quotations from the East and South make business in domestic pig iron impossible. Even by water, with iron at about $20 at producing point, freight and incidental charges bring the total much higher than prices at which foreign material is offered.

Cast Iron Pipe.—Water pipe has been advanced again in this district, and prices are now around $54 for 6-in., delivered, and $58 for 4-in. Business continues rather small, especially from private sources. Some few prospects from municipalities are in sight, but the tonnage involved is not of much consequence. Los Angeles awarded the contract for 3000 tons to the National Cast Iron Co. Santa Barbara is inquiring for 900 tons of mixed sizes. There are no new developments in the soil pipe market, and mills are not encouraging business, having already more than can be conveniently handled.

Finished Iron and Steel.—Strike conditions are brought home to buyers in this section principally through advancing prices and uncertain deliveries. Virtually every product is reflecting the strong tone of the market, but buyers are becoming more hesitant with each price advance, for they apparently do not feel justified in making large purchases, believing that with an early settlement of the deadlocks, prices will readjust themselves quickly. That opinion, however, is gravely questioned by many of the sellers, who point to higher wages and the serious check which both the steel industry and transportation have received. A little business in plates has been done at prices ranging from 2.60c. to 3c., delivered, according to mill and delivery. An oil company is inquiring for around 200 tons for several phlange and dish heads, 12 ft. in diameter. The Steel Corporation was awarded about

850 tons of 75-lb. A.S.C.E. rails, with fittings, to be used on the San Pedro harbor work. The rails are understood to have gone at about $44 net. Sheets have been quiet, and not much interest is reported in shapes at prices as high as 2.75c. Rivets have been advanced to 3c. to 3.10c., Pittsburgh. Structural steel demand is holding up pretty well at the new prices. The Baker Iron Works was awarded a contract involving 700 tons in the South. The bascule bridge planned for Badger Avenue, Los Angeles, will require about 2200 tons of material. Bids open Sept. 29. The city of Sacramento is planning to add to its facilities a filtration plant, with a capacity of 50,000,000 gallons per 24 hours, at a cost of approximately $800,000.

Coke.—About the same condition that prevails in pig iron applies to coke. New contracts are lighter in volume, only a meager business of this nature being reported. Spot material, however, is more active, and quite a trade, in 5-ton to carload lots, has been done. Spot is quoted from about $26 to $27, ex-yard and imports range from $17 to $20, ex-ship, according to quality. Under prevailing conditions, interest in domestic coke is negligible. The U. S. Navy is in the market for about 150 tons of coke for its Mare Island base, bids closing September 7.

Old Material.—The scrap market here appears to be in a good position, although sales have not been particularly large during the past week or two. Unsettled conditions in the East, doubtless, are tending to give some strength to the situation on the Coast, and prices on both cast and heavy melting material are well maintained at $11 per gross ton, delivered, for the latter and close to $24 per net ton, for cast. Ship scrap is coming on the market soon.

Cleveland

Sales of Moderate Tonnages of Pig Iron—Scrap Again Advances

CLEVELAND, Sept. 19.—Blast furnace operations continue to increase with the easing of the fuel situation. The American Steel & Wire Co. has started another stack in Cleveland, now operating three out of four Central furnaces and the Hanna Furnace Co. will blow in its Dover and the second Detroit stack this week, the latter furnace having been out of blast for a long time. This will make seven more active furnaces, four of them merchant stacks, than were being operated by Cleveland interests at the time of the coal strike settlement. None of the seven furnaces resuming operations will use Connellsville coke. The movement of bituminous coal has become heavy and as a result the car shortage for other products has become more acute. This is noticeable particularly in the shipment of pig iron against which a number of railroads have embargoes. It is also interfering with steel shipments from the Pittsburgh district. The suspension of operations by the Ford Motor Co. so far has not resulted in the holding up of shipping orders for pig iron by producers having Ford contracts and with but few suspensions of steel going directly to the plants making Ford parts. The Ford company has instructed its parts manufacturers to accumulate a backlog of finished parts, so that car production will not be delayed when the Ford plant starts up.

Iron Ore.—The wage advance of the U. S. Steel Corporation in the Lake Superior mining district ranges from 10 to 15 per cent above the old scales, as is shown by the rate sheets issued during the past few days. The wage rates in the mines have generally been higher than in the mills, which evidently explains why the miners were not given the 20 per cent increase granted common labor in the mills. Some of the independent mining companies will place corresponding wage advances in effect. Ore shipments are tapering off considerably. One large shipper has made a 10 per cent cut in maximum tonnages of outside vessel capacity it had contracted to take. One furnace that is resuming operations has commenced to take ore off the docks, but most furnaces have large yard stocks. With curtailed blast furnace operations stocks of Lake Superior iron ore at furnace yards increased over 5,500,000 tons in August. The amount on hand at furnaces Sept. 1 was 29,565,935 tons as compared with 23,830,461 tons on Aug. 1. The amount at furnace and Lake Erie docks Sept. 1 was 37,630,036 tons as compared with 31,127,303 tons on Aug. 1 and with 35,486,757 tons on Sept. 1 last year. The above figures appeared in the monthly report of the Lake Superior Iron Ore Association, which also shows a falling off of nearly 1,000,000 tons in the consumption of lake ore in August, the amount consumed during that month being 2,589,251 tons as compared with 3,582,715 tons in July.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, $5.95; Old range non-Bessemer, 51½ per cent iron, $5.20; Mesabi Bessemer, 55 per cent iron, $5.70; Mesabi non-Bessemer, 51½ per cent iron, $5.05.

Pig Iron.—The market continues fairly active in foundry and malleable grades. Prices on these grades are the same as quoted last week and while the market is very firm, there seems to be a disinclination among sellers to move prices to any higher level. A Pittsburgh district sanitary interest has purchased 1500 tons of No. 2X iron for October shipment from a Cleveland producer at $36.50, Cleveland, or at the base price of $36. The same interest which is offering iron only for October shipment also took a number of orders in Cleveland and vicinity at the same price. The Westinghouse Electric & Mfg. Co. is expected to close to-day on an inquiry for 1200 tons of foundry iron for early shipment, 1050 tons for Cleveland and 150 tons for Springfield, Mass. Another lake furnace interest reports sales of several thousand tons of foundry and malleable iron during the week for fourth quarter delivery, the prices ranging from $32 to $33.50 at furnaces. The orders include one 1000-ton lot of foundry iron and another for 1000 tons of malleable iron, both from Ohio melters. Southern Ohio iron is still available at $32. The demand for high silicon foundry iron has been stimulated by the fact that foundries are not getting Alabama iron as needed because of slow shipments. In some cases it has taken over 60 days for Southern iron to reach its destination. The only activity in basic iron is the reported sale of 20,000 tons by a Valley steel maker at $34. There was considerable activity during the week in Southern iron, one interest making a number of sales in this territory in lots of 400 tons and under at $25, Birmingham. Late in the week the price was raised to $28 and some business was booked at that base price. For iron running 2.25 per cent and higher in silicon, this seller is quoting 50c. differential or $28.50.

Quotations below are f.o.b. local furnace for Northern foundry iron, not including a 50c. switching charge. Other quotations except basic and low phosphorus are delivered Cleveland, being based on a $3.02 rate from Jackson and a $6 rate from Birmingham:

Basic, Valley furnace, nominal	$34.00
Northern No. 2 fdy., sil. 1.75 to 2.25	36.00
Southern fdy., sil. 1.75 to 2.25	31.00
Malleable	36.00
Ohio silvery, sil. 8 per cent	44.52
Standard low phos., Valley furnace	38.00

Semi-Finished Steel.—No quotations are being made on semi-finished steel in this territory, although there is considerable inquiry for fourth quarter contracts. With an advance in basic pig iron, the market on billets, sheet bars and slabs is regarded as around $44.

Finished Material.—With increasing steel production, buyers are showing less disposition to pay the maximum prices, particularly on steel bars and structural material. While mills that are quoting these at 2c. for delivery in 30 to 60 days are getting a heavy volume of orders, others that are asking 2.25c. are booking very little business, although in some cases as high as 3c. is being paid for steel bars in small sizes for quick shipment. Plates continue in good demand, with quotations ranging from 2c. to 2.50c., most of the larger orders for early delivery going at 2.25c. The Gulf Refining Co. is inquiring for stills requiring 600 tons of plates and another new inquiry has appeared for stills that will require 360 tons. The $3 a ton advance on steel rails by the Steel Corporation has brought

no announcement from the independent mills as to their attitude on rail prices. It is expected that some of the railroads in this territory will close for their 1923 rail requirements before Oct. 1, when the advance goes into effect. The leading interest has also made a $3 per ton advance on light rails to 2.15c. The Illinois Steel Co. has announced a $2 a ton advance on track bolts to 3.85c., and on spikes to 2.85c. Splice bars will be advanced Oct. 1 to 2.75c. Sales of wire rods are reported at $46. In the building field there is a falling off in inquiries and some work on which bids were received is being held up. One large inquiry has appeared, being for 5000 tons of structural material for a plant for the Toledo Libby-Owens Sheet Glass Co., Toledo. With the approach of the winter the demand for reinforcing bars in round lots has fallen off, but considerable business continues to come out in small lots. Hard steel reinforcing bars are unchanged at 2c.

Jobbers quote steel bars, 2.81c.; plates and structural shapes, 2.91c.; No. 9 galvanized wire, 3c.; No. 9 annealed wire, 2.50c.; No. 28 black sheets, 4.25c.; No. 28 galvanized sheets, 5.25c.; No. 10 blue annealed sheets, 3.50c. to 3.61c.; hoops and bands, 3.61c.; cold-rolled rounds, 3.60c.; flats, squares and hexagons, 4.10c.

Sheets.—While some independent mills are now asking higher prices, others are adhering to 3.50c. for black, 4.50c. for galvanized and 2.60c. for blue annealed sheets. There is a fair demand for sheets for prompt shipment, but the seasonal falling off in orders from the automobile field is noticeable.

Bolts and Nuts.—Specifications on contracts taken at the old prices that expire Oct. 1 are heavy, and manufacturers are booking a great deal of business in fourth quarter contracts. Prices are firm. Production by some manufacturers is curtailed by a shortage of wire and steel bars. Rivet manufacturers are getting a good volume of orders, particularly from locomotive manufacturers, and are closing many contracts for the fourth quarter at the recent advance in prices. The market is very firm.

Coke.—Connellsville foundry coke is still held at $13 with a supply sufficient to meet the demand, which is light. We note the sale of 25 cars of Indianapolis by-product coke to a Cleveland consumer at $16. No activity is reported in furnace coke. Furnaces in this territory that have resumed operations or will start up this week are using by-product coke.

Old Material.—Heavy melting steel scrap has further advanced $1 per ton and most grades were marked up from 50c. to $1 per ton or more during the week. With the limited supply of scrap and the scarcity of pig iron and higher prices, the trend of the market still seems to be upward and dealers and producers are holding for a further advance. Valley dealers are offering $21 for heavy melting steel and a Youngstown mill is understood to have offered the same price. Some dealers are asking $22 for this grade for Valley delivery. A Cleveland dealer bid $21.60 delivered Youngstown to a Sharon producer for heavy melting steel scrap, but evidently was outbid. Local dealers have paid $19 for heavy melting steel scrap and $19.50 is understood to have been offered. Outside of heavy melting steel, turnings and borings are the more active items. Sales of machine shop turnings at $14 and mixed borings and short turnings at $14.50 are reported.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel	$18.75 to $19.25
Steel rails under 3 ft.	20.00 to 21.00
Steel rails, rerolling	21.00 to 22.00
Iron rails	17.00 to 17.50
Iron car axles	25.00 to 26.00
Low phosphorus melting	19.00 to 20.00
Cast borings	14.00 to 14.25
Machine shop turnings	13.75 to 14.00
Mixed borings and short turnings	14.00 to 14.50
Compressed steel	16.00 to 16.50
Railroad wrought	17.75 to 18.50
Railroad malleable	18.50 to 19.00
Light bundled sheet stampings	12.50 to 13.00
Steel axle turnings	15.25 to 15.50
No. 1 cast	20.50 to 21.00
No. 1 busheling	13.50 to 13.75
Drop forge flashings over 10 in.	13.00 to 13.50
Drop forge flashings under 10 in.	13.75 to 14.25
Railroad grate bars	16.50 to 17.00
Stove plate	16.50 to 17.00
Pipes and flues	14.00 to 14.50

Philadelphia

Railroad Requirements Loom Large in a Somewhat Halting Market

PHILADELPHIA, Sept. 19.—In some respects the iron and steel markets have come to one of those halting periods which develop when buyers expect conditions and prices to turn in their favor. It seemed to have been the opinion of many that a few weeks of large coal production would bring decided relief all along the line. That such has not yet been the case, except to a minor degree, is the cause of considerable perplexity. Sellers freely concede that prices are on too high a level for large or sustained buying, but they hesitate making reductions until costs also have gone down. Coke, which is an important factor in the situation, was expected to show quickly the effects of freer coal supply, but prices of coke weakened last week only to advance $1 a ton this week. The firmer tone is due not to coke shortage but to shortage of cars. The opinion prevails that while there may be some easing in prices of pig iron and steel any marked tendency in that direction over the remainder of this year, at least, is unlikely because of the effect which inadequate car supply will have upon production costs and the supply of material.

The more important developments of the market have to do with railroad requirements, in which rails now figure prominently since the announcement by the Steel Corporation of an advance to $43 per gross ton, effective Oct. 1. Independent rail producers have followed in this advance. Orders for several hundred thousand tons from Eastern roads are now pending.

Pig iron and steel are in better supply, and while there have been no marked changes in prices, the price situation is slightly easier in that the buyer no longer is obliged to pay the top prices. In scrap, sensational price advances have occurred, amounting in a few instances to several dollars a ton within the week.

Pig Iron.—With increased production of pig iron in sight, both for steel-making purposes and for foundry use, the attention of both buyers and sellers is more closely focused on the probable price situation over the remainder of the year than on the current market. Domestic iron is being offered more freely, and while concessions from the peak prices have been comparatively slight, buyers are not now paying these prices unquestioningly as they did during the most critical period of the coal strike. One Eastern furnace which went as high as $34, base, for foundry iron is adhering to that level, but another, which also went to $34, is now selling at a reduction of $1 a ton, and still another furnace interest, as reported last week, is offering foundry iron freely at $32, furnace, for No. 2 plain, $33 for No. 2X and $34 for No. 1X. A furnace which has been making ferromanganese produced about 1000 tons of foundry iron in preparing to bank, and this iron has been placed on the market on a $32 base at furnace. Foreign iron continues to sell more freely than domestic grades, as more melters have found that they can use the imported iron successfully in their mixtures. There has been no weakness in prices of foreign iron, which can be had slightly below the quotations on domestic iron of similar analysis. Importation of low phosphorus iron has been a new development, a Chester steel castings plant taking 5000 tons of copper bearing iron, maximum 0.04 per cent phosphorus, at $28.50, c.i.f. Philadelphia. A locomotive company subsidiary manufacturing forgings is also reported to have bought a tonnage of the same grade at about the same price. A small lot of imported copper free low phosphorus iron, maximum 0.035 per cent phosphorus, was sold at $32, c.i.f. Philadelphia, and more is available at the same price. No domestic copper free low phosphorus iron is to be had in the East, but copper bearing iron is quoted at $37 to $38, furnace. Important sales of domestic iron within the week included 4000 tons of basic at $30, furnace, to a

(*Continued on page* 758)

BETHLEHEM-LACKAWANNA

Timothy M. Burns General Manager at Buffalo—Many Changes in Sales Offices

Stockholders of the Bethlehem Steel Corporation and the Lackawanna Steel Co. in special meetings Sept. 18 formally approved plans under which the latter company's property will be absorbed by the Bethlehem Steel Corporation. Although the exchange of stock will not be completed until the lapse of two or three weeks the transfer of the Lackawanna's plants to Bethlehem took place Sept. 19 and henceforth all sales will be made in the name of the latter company.

Coincident with the taking of control by Bethlehem on Tuesday, Timothy M. Burns became general manager of the plants at Lackawanna, N. Y. For some years he has been general superintendent of the Saucon plant at South Bethlehem. George W. Whitehead, who has been general superintendent of the Lackawanna plant, under the presidency of George F. Downs, who has resigned, becomes assistant general manager. The Lackawanna operating organization as to department superintendents remains unchanged.

A number of changes in the sales department of the Bethlehem Steel Co. are announced, in view of the taking on of Lackawanna products. Edward S. Illig becomes Buffalo district sales manager, being transferred from the Bethlehem Steel Co.'s Pittsburgh office. The Buffalo sales district will hereafter include Toronto and adjacent Canadian territory, in view of the recent action by which Canada has been separated from the foreign territory covered by the Consolidated Steel Corporation. Mr. Illig's successor at Pittsburgh will be E. B. C. Goyne, heretofore in charge of sales at St. Louis. William Chapman goes from the Chicago office to take charge of sales at St. Louis. Robert E. Belknap, who has had charge of sales at Chicago, becomes manager of sales in the Boston district. He is suceeded at Chicago by E. E. Goodwillie, heretofore Bethlehem's sales manager at Cleveland. R. B. Wallace remains at Boston as assistant manager of sales. The Cleveland office hereafter will be in charge of John C. Chandler, who for a number of years has represented the Lackawanna Steel Co. in that territory. New Bethlehem sales offices will be opened at Los Angeles, Cal., and Seattle, Wash.

Consolidated Steel Corporation to Be Reorganized

The companies which have been members of the Consolidated Steel Corporation, incorporated Jan. 2, 1919, to act as their export representatives, recently decided that they would prefer to handle their export business to Canada themselves, and as this is an important part of the business of the Consolidated Steel Corporation, it has been decided to reorganize the corporation. Details have not been determined. The original member companies were: Bethlehem Steel Co., Brier Hill Steel Co., Lackawanna Steel Co., Lukens Steel Co., Midvale Steel & Ordnance Co., Republic Iron & Steel Co., Sharon Steel Hoop Co., Trumbull Steel Co., Whittaker-Glessner Co., Youngstown Sheet & Tube Co. Three other companies—the Railway Steel Spring Co., Standard Steel Works Co. and Edgewater Steel Co.—have done their export business through the corporation, although not included in its membership.

Brier Hill Steel Co. Authorizes Large Expenditure

YOUNGSTOWN, OHIO, Sept. 19.—Directors of the Brier Hill Steel Co. Tuesday authorized an expenditure approaching $1,000,000 to rebuild the Thomas plant at Niles, consisting of 12 sheet rolling units. The rehabilitation will enlarge the Thomas plant's capacity 25 per cent. Plans include new steam drive installation, relocating rolling mills, rearranging buildings, installing new annealing furnaces and warehouses. Work is started at once and will require six months for completion.

Decision to proceed with an expansion program was withheld, but directors will meet Sept. 25 to discuss such a program.

The directors declared the usual quarterly preferred dividend of $1.75 per share, payable Oct. 1 to stock of record Sept. 20.

The directors of the Trumbull Steel Co., Warren, Ohio, have increased the common dividend from 20 to 25c. for the third quarter, and authorized the usual quarterly preferred payment.

Stockholders of the Electric Alloy Steel Co., Youngstown, will meet Sept. 30 to ratify the merger with the Atlas Crucible Steel Co., Dunkirk, N. Y., details of which are now being completed, following four months negotiations. The merged interests will have an annual productive capacity of 45,000 tons of highspeed tool and special analysis steels. Details of financing arrangements have been submitted to shareholders of both constituents.

Jones & Laughlin Steel Co. Operations

Jones & Laughlin Steel Co., Pittsburgh, recently started up 300 of its beehive coke ovens near its South Side works, Pittsburgh. The company has 1820 ovens of this type and has not operated them for about two years. The company now is making sufficient coke to meet the requirements of 10 blast furnaces and it expects to have that number active by the end of this month. The company is unusually fortunate in that its coal mines are located near the Monongahela River and it is able to bring down practically all of its production by water and escape the restrictions of railroad snarls or priority distribution orders.

The company is making preparations for a resumption of river shipments of steel products. River transportation is difficult during the summer months, when the rivers are shallow and a number of barges sent south by this and other companies in early summer still are tied up at southern points. There will be plenty of barges for the fall shipments and with deeper water the Jones & Laughlin company and other steel makers in Pittsburgh will be partly able to overcome any railroad transportation snarls which may grow out of the lack of cars or insufficient motive power.

The Southern Wire & Iron Mfg. Co., Dallas, Tex., headed by W. A. Sedwick, has purchased seven acres of industrial property south of the city, and will build four factory units there by Jan. 1, at an estimated cost of $50,000. Ornamental iron, structural steel, fire and elevator doors, fire escapes and miscellaneous products will be fabricated in the new plant. Seventy-five men are to be employed. The company is an old one in Dallas, and the present project is an enlargement of its activities.

Motor car production for August aggregated 272,640, by far the heaviest August production on record, and an increase of 12 per cent over July, according to reports received by the National Automobile Chamber of Commerce. It is estimated that the yearly production will reach the 2,000,000 mark.

Standard Steel Car Co., Butler, Pa., has advanced wages of workmen paid on a daily basis 15 per cent and has made a corresponding adjustment in the scales of piece and tonnage workmen, effective Sept. 16.

BRITISH IRON AND STEEL

Exports and Imports Both Increase in August Over July and June

WASHINGTON, Sept. 19.—The United Kingdom imported 80,113 gross tons of iron and steel during August and exported 269,983 tons, according to a cable received by the Department of Commerce from Commercial Attaché, Walter S. Tower, London. These figures compare with exports of 251,743 tons in July and 249,089 tons in June and with imports of 55,893 tons in July and 58,856 tons in June. The month's cargoes consisted chiefly of the following:

	Gross Tons	
	Imports	Exports
Pig iron and ferroalloys	15,482	46,250
Ingots, blooms, billets, slabs, etc.	21,441	451
Steel rods, bars, angles, etc.	11,245	18,087
Iron bars, rods, angles, etc.	5,972	2,702
Structural steel	5,473	4,585
Rails	1,715	22,470
Other railroad material	636	15,401
Plates and sheets	1,616	24,850
Galvanized sheets	.....	47,404
Tin plate	.....	36,817
Wire	2,941	5,893
Wire cable and rope	.....	1,986
Wire nails, including staples	3,192	322
Other wire manufactures	329	1,509
Hoops and strips	2,911	4,834
Wrought tubes, pipes and fittings	2,023	8,395
Cast tubes, pipes and fittings	1,964	8,093
Bolts, nuts, including screws for metals	391	1,803
Nails, tacks, rivets and washers	171	1,042
Rough iron and steel castings	240	253
Rough iron and steel forgings	139	45

Production of pig iron of all classes by the United Kingdom in August totaled 411,700 tons, and the output of steel ingots and castings was 520,800 tons. At the end of August there were 126 blast furnaces and 251 open-hearth furnaces in operation.

British Pig Iron and Steel Output for August

LONDON, ENGLAND, Sept. 16 (*By Radio*).—The production of pig iron in Great Britain in August was 411,700 gross tons and that of steel ingots and castings 520,800 tons. These compare with 399,100 tons of pig iron and 473,100 tons of steel ingots and castings in July.

The pig iron and steel output for Great Britain by months so far this year has been as follows in gross tons:

1922	Pig Iron	Steel Ingots and Castings
January	288,000	327,500
February	300,100	418,800
March	389,800	549,400
April	394,300	404,200
May	407,900	462,300
June	369,200	400,200
July	399,100	473,100
August	411,700	520,800

The August output of pig iron is the largest month of the year, while that of steel is second to the March production. The 1921 pig iron production averaged 217,600 tons per month and the steel output 302,100 tons per month. In 1913 the two figures were 855,000 tons and 639,000 tons per month respectively.

Russian Iron and Steel Production

BERLIN, GERMANY, Sept. 6.—The Russian iron and steel production is gradually improving. The supplies of ore and fuel going to the works are, however, still irregular. Production is therefore fluctuating. The figures for the first three months of 1922, for instance, were much higher than those for the second quarter.

Several great works in the South are being restarted and those already working have been able to increase their output during the present year considerably. During the first half of 1921, 69 per cent of the Russian pig iron was produced in the Ural, 11 per cent in the South, and 20 per cent in Central Russia. This year the percentage of production has changed to 44 per cent in the Ural, to 40 per cent in the South, while the output of the works in Central Russia remained about the same.

The Russian production of pig iron during the first six months of 1922 amounted to 88,600 metric tons of which the works in the Ural produced 39,600 tons, those in the South 36,200, and those in Central Russia 12,800 tons. The whole output of open-hearth steel was 163,200 tons, and the share of the three districts amounted to 70,100 tons, 63,700 tons and 29,400 tons respectively. Rolled material was produced to the amount of 55,800 tons in the Ural, 52,600 in the South and 16,700 in Central Russia.

Export Market Dull

NEW YORK, Sept. 19.—Dullness in export trade now prevails not only in all foreign markets, but in what has recently been a fairly large item, purchases from government sources in Japan. Although the Japanese are at present evidently doing most of their buying of light gage black sheets on the Continent of Europe, they continue to manifest some interest in American material and several exporters are handling requests for quotations on standard American brands of black sheets of light gage, which they doubt will materialize into business because of price.

Purchases of rails are still about the most important of any business coming from the Far East. On a recent tender issued by a municipality in Japan, calling for 27 miles of 60-lb. rails, a bid of 524 fr. Belgian (about $37.57) per ton, c. and f. Japanese port, was submitted by a Belgian mill and £9 2s 6d (about $40.20) per ton, c. and f. Japanese port, which was later reduced to £9 per ton (about $39.87) by the Krupp works in Germany. The Belgian delivery was about 16 weeks, against a promised shipment by Germany in 12 to 14 weeks. The business is not yet reported as placed. The tender of the South Manchuria Railway Co., issued several weeks ago, calling for 700 tons of tie plates for 100-lb. rails, has been awarded to the Mitsubishi Shoji Kaisha, 120 Broadway, New York, and will be filled by the United States Steel Products Co.

The Chinese market is dull, the little buying evidently being done in European markets, because of lower prices. An annual inquiry for 2,000,000 No. 26 gage black sheets, which recently came up, received a bid of £16 6s, c.i.f. Tsientsin, against the bid of the American seller of £17, c.i.f. Tsientsin. The previous year's business from this source was equally divided between American and British mills, 1,000,000 sheets to each. Companies in touch with conditions in China do not expect any general improvement in business until the political situation is more settled.

Increased Demand for Ore in Sweden

WASHINGTON, Sept. 19.—Decided improvement in the market for iron ore in Sweden has been reported to the Department of Commerce by Consul Murphy, Stockholm. By the end of June, it is stated, 460,000 more tons of ore were shipped from Narvik, one of the principal shipping ports, than at the close of June, 1921. Shipments from Lulea, another important shipping port, were considerably in excess of those of January-June, 1921. Stocks of ore at the mines have largely diminished.

German dumping is declared to be the great disturbing factor in both iron and steel. In rolled products only, it is declared, is there a noticeable return to normal prices and fair demand. Prices of iron are said to be below cost of production.

Increased exports of iron ore from the Lorraine mines are reported by Assistant Trade Commissioner Green, Paris, the total for the first six months of the present year aggregating 4,328,453 metric tons, valued at 99,000,000 francs, according to official figures. These figures indicate an encouraging increase over the export during the corresponding period of 1921, which totaled 2,666,428 metric tons, valued at 61,000,000 francs. Germany is taking an increasing proportion of the Lorraine output.

COPPER DEMAND FROM JAPAN

Speculative Stocks Are Being Absorbed and Imports from United States May Increase

TOKIO, JAPAN, Aug. 1.—In anticipation of the high price of electrolytic copper in Japan after the revised customs tariff rate was brought into force, orders for electrolytic copper had been placed in the American market and more than 10,000 tons was imported into Japan speculatively. When the revised rate of customs was enforced, the price of copper showed an improvement by 5 to 6 yen per 100 kin (133 lb.). Last spring, when the customs tariff was revised, the monthly consumption of copper was estimated at 5500 tons or more, but afterward consumption tended to decrease by degrees, and the Japanese market continued to be much affected by the excess supply. Owing to the fact that the quotation in the American market remained below 14c., the price of copper in Japan stood at about 45 yen per 100 kin (or about 17c. per lb.) in May and June last. At that time the net stocks of copper in the hands of producers, putting aside the quantity which is to be consumed in Japan, amounted to about 5000 tons.

The monthly output of the Kuhara, the Fujita, the Mitsubishi, the Furukawa, the Sumitomo and other copper companies amounts to about 3500 tons, while their monthly consumption aggregated 2500 tons, the remainder, approximately 1000 tons, being added to stock.

On the other hand, the monthly consumption of the Fujikura Copper Mfg. Co., the Denki-Bundo Kaisha and other copper manufacturers is estimated to be 1300 tons, and adding the above to the consumption of arsenals, naval yards, the Government mint and others, the consumption of copper in Japan aggregates 5000 to 5500 tons per month. Thus consumption exceeds the output by 1500 to 2000 tons monthly, which represents the amount imported. Recently the demand for copper has improved and the stocks on hand, which are partly consumed by the copper and brass goods manufacturers and partly exported to China and elsewhere, have decreased considerably. If present operations continue, stocks on the Japanese market will be drawn down in the near future. It is expected in that case that the quotation for electrolytic will become stable at 46 to 47 yen per 100 kin, if the price is maintained around 14c. on the American market.

GERMAN STEEL PRICES GO UP

Advances Made Over Figures Prevailing from Sept. 1 to Sept. 10

By Cable

BERLIN, GERMANY, Sept. 18.—Prices of ingots have gone to 34,370 marks per metric ton ($24.44 per gross ton, at 7c. per 100 marks); of bars to 46,930 marks (1.49c. per lb.); of sheets exceeding 5 mm. (No. 6 United States gage) to 52,750 marks (1.675c. per lb.). Foundry iron is now quoted at 36,242 marks ($25.78).

These prices replace 27,530 marks ($21.68) for ingots; 37,020 marks (1.30c. per lb.) for bars; 41,580 marks (1.46c. per lb.) for sheets and 24,491 marks ($19.28) for foundry iron No. 1, all figured at the rate of 7¾c. per 100 marks, prevailing Sept. 2.

Railroad Charge for Placement of Ore Cars Held to Be Reasonable

WASHINGTON, Sept. 19.—In a tentative report made to-day Examiner Hunter recommends that the Interstate Commerce Commission find that the delivery charge of 3c. per gross ton on ex-lake iron ore in carload lots at the Youngstown, Ohio, plant of the Carnegie Steel Co. is applicable to placement of cars on the company's incline tracks and that it is not unreasonable. It was charged by the Carnegie company that the delivery charge does not apply on service performed by the carriers and that if such a charge is applicable it is unreasonable and should be eliminated. It was claimed that the road haul rate includes or should include placement on the incline tracks and the removal of empties to out-bound tracks.

Ohio Foundry Activities

The report of the Ohio State Foundrymen's Association, issued Sept. 16, and covering the operations of the member foundries for August, shows that operations have now reached 70 per cent of normal, as compared with 58 per cent in July. The report states that many foundries were confronted with great difficulty in maintaining operations due to a shortage of raw materials, but that some relief is now in sight. The non-ferrous foundries had been able to maintain operations throughout August practically at a normal rate, and have sufficient raw materials on hand to keep running through September. Shipments on contracts, particularly from northern furnaces, were good during the month, but with the increased melt the stocks on foundry yards have declined to the lowest level since the organization was formed.

Iron and Steel Imports in July

More than one-third of the total tonnage of iron and steel entering the United States in July was ferromanganese and over 60 per cent was ferromanganese and pig iron. Canada and the United Kingdom, considered together, furnished us with more than 70 per cent of our total import tonnage of iron and steel items. The aggregate of 72,426 tons came from the eleven sources detailed in the table below.

Countries	Tons	Countries	Tons
United Kingdom	30,972	China	500
Canada	19,908	Germany	231
Sweden	10,990	Virgin Islands	145
Brazil	7,800	Dominican Republic	3
Belgium	766		
France	611		
Netherlands	500	Total	72,426

It is of interest to note that the imports of ferromanganese in July, 25,841 tons, were almost as great as the 27,288 tons for the entire six months preceding. Similarly, the pig iron coming in during July, 18,828 tons, amounting to more than two-thirds of the tonnage, 26,399 tons, for the entire six months preceding. Of smaller tonnage, but more striking in the proportion entering in July, was bar iron, of which the month's tonnage amounted to 10,131 against 1400 tons in the six preceding months.

Swedish Foreign Trade in Iron Ore and Steel

The following table shows the Swedish imports and exports of iron and steel, and the exports of iron ore last June and the six months ended therewith, compared with the same periods in 1921 in gross tons:

	June, 1921	June, 1922	Jan.-June, 1921	Jan.-June, 1922
Iron ore exports	420,084	560,680	2,129,034	2,084,104
Iron and steel exports	10,890	15,487	61,335	81,396
Iron and steel imports	13,527	9,182	72,219	54,260

Copper Shipments Making Records

Shipments by American copper producers in August are reported to have exceeded 170,000,000 lb., compared with 172,418,000 lb. in July and 176,774,000 lb. in June. About 70,000,000 lb. was for export and 100,000,000 lb. for domestic consumption. The figures for these three months represent the largest shipments for any three "peace" months in the history of the industry.

British Iron and Steel Market

American Buying of British Pig Iron Has Stiffened Prices—British Steel Prices Weak in Face of Better Demand

(By Cable)

LONDON, ENGLAND, Sept. 19.

Cleveland pig iron is strong as a result of continued American demand, up to 95s. ($21.00) being paid for No. 3 G.M.B. Better grades are practically unobtainable for prompt shipment. Most makers are quoting November as the earliest date. Home business is quiet.

Hematite is weak. East Coast mixed numbers are sold at down to 88s. ($19.45) and stocks are accumulating.

There is improved demand for finished iron and steel, especially plates and angles, and some orders have been placed. Prices generally are unchanged, though some works are willing to grant concessions.

Continental steel generally is quiet. India and China are buying a little, but other markets are holding aloof.

Tin plate is easier on decreased sales. Makers are perturbed at falling prices and are considering cutting down production. Some small sales have been made to India, Canada, South America and Australia. There is a fair home trade demand. Odd sizes are being done at 18¾s. ($4.14) f.o.t. There is moderate inquiry for wasters, these being quoted at 16¾s. ($3.70) to 17s. ($3.76) basis, f.o.t.

Galvanized sheets are quiet, but there are signs of improving demand. India has bought small parcels and anticipations are entertained of substantial business before long. Australia and South Africa are buying small lots steadily.

Black sheets are steady. There is some revival of demand for Japanese specifications, but sales are only meager.

We quote per gross ton, except where otherwise stated, f.o.b. maker's works, with American equivalent figured at $4.42 per £1, as follows:

Durham coke, delivered	£1 7s.		$5.97	
Cleveland No. 1 foundry	4 17½		21.66	
Cleveland No. 3 foundry	4 12½	to £4 15s.	20.33	to $21.00
Cleveland No. 4 foundry	4 9	to 4 10	19.67	to 19.89
Cleveland No. 4 forge	4 5		18.79	
Cleveland basic	4 0		17.68	
East Coast mixed	4 8	to 4 10	19.45	to 19.89
Ferromanganese	15 0		66.30	
Ferromanganese*	14 10	to 14 15	64.09	to 65.20
Rails, 60 lb. and up	7 5	to 8 0	32.05	to 35.36
Billets	7 2½	to 8 0	31.38	to 35.36
Sheet and tin plate bars, Welsh	7 7½		32.71	
Tin plates, base box	0 19	to 0 19¼	4.20	to 4.25
			C. per Lb.	
Ship plates	8 15	to 9 5	1.73	to 1.83
Boiler plates	11 10	to 12 0	2.27	to 2.37
Tees	9 0	to 9 10	1.78	to 1.88
Channels	8 5	to 8 15	1.63	to 1.73
Beams	8 5	to 8 15	1.63	to 1.73
Round bars, ¾ to 3 in.	9 0	to 9 10	1.78	to 1.88
Galvanized sheets, 24 g.	16 5	to 16 10	3.21	to 3.26
Black sheets	12 0		2.37	
Steel hoops	11 0	& 11 10*	2.17 &	2.27*
Cold rolled steel strip, 20 g.	23 2½		4.56	
Cotton ties, Indian specifications	15 0		2.96	

*Export price.

Continental Prices, All F. O. B. Channel Ports, Delivery as Specified

No. 3 foundry pig iron:				
Belgium, October	£4 5s.		$18.79	
Luxemburg, October	4 5		18.79	
France, October	4 5		18.79	
Billets:				
France, Oct., Nov.	5 12½	to £5 15s.	24.86	to $25.42
Luxemb'g, Oct., Nov.	5 12½	to 5 15	24.86	to 25.42
Lorraine, Oct., Nov.	5 12½	to 5 15	24.86	to 25.42
Wire nails (keg basis):				
Germany	0 14½		3.20	
Belgium	0 20½		4.53	
Wire rods, 5 mm. (0.2 in.):				
Belgium	7 5	to 10 7½	32.05	to 45.97
Angles:			C. per Lb.	
Belgium, September	7 7½		1.46	
Tees:				
Belgium	8 5		1.63	
Merchant bars:				
Belgium, Nov., Dec.	7 10	to 7 12½	1.48	to 1.51
Luxemb'g, Nov., Dec.	7 10	to 7 15	1.48	to 1.53
France, Nov., Dec.	7 10	to 7 12½	1.48	to 1.51
Germany, Jan., Feb.	7 10		1.48	
Joists (beams):				
France, Oct.	6 15	to 7 2½	1.33	to 1.41
Belgium, Oct.	6 15	to 7 2½	1.33	to 1.41
Luxemb'g, Oct., Nov.	7 0	to 7 2½	1.38	to 1.41
Channels:				
Belgium	7 10	to 7 12½	1.48	to 1.51
⅜-in. plates:				
Germany, Nov., Dec.	8 0		1.58	
Belgium, Sept., Oct.	7 10	to 8 0	1.48	to 1.58
Luxemburg, Oct.	7 12½	to 7 15		
France, not offered.				
⅛-in. plates:				
Germany	9 0		1.78	
No. 8 gage wire:				
Belgium, August	14 10⅝		2.87	

American Pig Iron Buying—More Blast Furnaces to Start—German Offer for Old Liners

LONDON, ENGLAND, Sept. 7.—The continued demand for pig iron from American consumers has led to an improved tone, and already some prices have been advanced by about 2s 6d a ton. America has been buying Cleveland, Midland and Lincolnshire material, as well as some small purchases from the continent. Scotch pig iron seems now to be too dear. In the Cleveland district there are 29 furnaces in blast, but if the demand from the United States is sustained some increase in output is likely. There is talk of relighting another seven or eight furnaces soon. No. 3 Cleveland is now quoted at 90s—for either the home trade or for export. Hematite quotations keep firm in spite of only a moderate demand, and makers still have considerable stocks to work off before increasing the output. Sellers of East Coast mixed numbers quote 89s to 91s 6d.

In the finished iron and steel market, now that the holidays are over, traders are beginning to look to some good autumn business. The home trade is showing more interest, but the export markets, particularly on the continent, are quiet. Steel makers' order books, however, are somewhat healthier, but the volume of new business is far from equal to capacity. The reductions in prices since control was abolished, were of course right, but the continent is still able to compete, though deliveries from that side are much prolonged.

Among some recent contracts of interest is one for water turbines and an electrical plant for India, which has been secured by Messrs. Vickers & Co. Sir William Arrol & Co., Glasgow, have been awarded a large part of the contract for the construction of a new dry dock at Sunderland. The dock is to be 500 ft. long and 75 ft. broad, and will be considerably larger than any existing dry dock on the river Weir.

Some of the leading shipping companies of Germany have been making definite offers for some of the German liners, which were handed over to this country under the peace treaty terms, and were bought by British companies from the reparations commission. It is stated that these vessels are required for services between Germany and the United States. The prices which the German buyers are offering are considerably above those which the British companies pay. So far, however, all offers have been rejected.

A Walworth warehouse is being erected on Jackson Avenue, Long Island City, New York, for the Walworth Mfg. Co., Boston, by Dwight P. Robinson & Co., New York. The plant will include a three-story and basement concrete building capable of receiving three floors later on, a garage to accommodate eight trucks, a pipe storage building and a pipe shop extension at the rear of the main building, besides the necessary retaining walls, platforms, railroad sidings and the like. The pipe storage building is to be 60 x 214 ft., served with a crane running out over the railroad siding.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Plates

Sheared, tank quality, base, per lb.....2.00c. to 2.25c.

Structural Material

Beams, channels, etc.....2.00c. to 2.25c.

Iron and Steel Bars

Soft steel bars, base, per lb.....1.90c. to 2c.
Refined iron bars, base, per lb.....2.50c.

Hot-Rolled Flats

Hoops, base, per lb.....2.75c. to 3c.
Bands, base, per lb.....2.75c. to 3c.
Strips, base, per lb.....2.75c. to 3c.
Cotton ties, per bundle of 45 lb.....$1.12

Cold-Finished Steels

Bars and shafting, base, per lb.....2.50c.
Strips, base, per lb.....4.25c. to 4.50c.

Wire Products

Nails, base, per keg.....$2.60 to $2.75
Bright plain wire, base, per 100 lb..... 2.35 to 2.50
Annealed fence wire, base, per 100 lb..... 2.35 to 2.50
Galvanized wire, base, per 100 lb..... 2.85 to 3.00
Galvanized barbed, base, per 100 lb..... 3.15 to 3.40
Galvanized staples, base, per keg..... 3.15 to 3.40
Painted barbed wire, base, per 100 lb..... 2.65 to 2.90
Polished staples, base, per keg..... 2.65 to 2.90
Cement coated nails, base, per count keg.....2.10c. to 2.35c.
Woven fence, carloads (to jobbers).70½ to 72 per cent off list
Woven fence, carloads (to retailers).68 to 69½ per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads.60 and 10 per cent off list
Machine bolts, small, cut threads.50, 10 and 10 per cent off list
Machine bolts, larger and longer..50, 10 and 10 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads, 50, 10 and 10 per cent off list
Cut threads .....50 and 10 per cent off list
Longer and larger sizes.....50 and 10 per cent off list
Lag bolts .....60 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.:
Smaller and shorter.....45 and 10 per cent off list
Larger and longer sizes.....45 and 10 per cent off list
Hot pressed square or hex. blank nuts.....$3.75 off list
Hot pressed nuts, tapped..... 3.75 off list
C.p.c. and t. sq. or hex. nuts, blank..... 3.75 off list
C.p.c. and t. sq. or hex. nuts, tapped..... 3.75 off list
Semi-finished hex. nuts:
9/16 in. and smaller, U. S. S.....80 per cent off list
⅝ in. and larger, U. S. S.....75 per cent off list
Small sizes, S. A. E.....80 and 10 per cent off list
S. A. E., ⅝ in. and larger.....75 and 10 per cent off list
Stove bolts in packages.....80 and 5 per cent off list
Stove bolts in bulk.....80, 5 and 2½ per cent off list
Tire bolts .....50, 10 and 10 per cent off list

Cap and Set Screws

Milled square and hex. head cap screws....75 per cent off list
Milled set screws.....75 per cent off list
Upset cap screws.....75 and 10 per cent off list
Upset set screws.....80 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb.....$3.00
Large boiler rivets, base, per 100 lb..... 3.10
Small rivets .....65 to 65 and 5 per cent off list

Track Equipment

Spikes, 9/16 in. and larger, base, per 100 lb....$2.75 to $2.85
Spikes, ½ in. and smaller, base, per 100 lb..... 3.00 to 3.50
Spikes, boat and barge, base, per 100 lb..... 3.00 to 3.50
Track bolts, base, per 100 lb..... 3.75 to 4.50
Tie plates, per 100 lb..... 2.25
Angle bars, base, per 100 lb..... 2.40

Welded Pipe

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛	51½	26	⅛ to ⅜.....+ 7		+33
¼ to ⅜.....	57	31½	½	26	8
½	62	48½	¾	32	17
¾	66	54½	1 to 1½.....	34	19
1 to 3.....	68	56½			

Lap Weld

2	61	49½	2	29	15
2½ to 6.....	65	53½	2½ to 6.....	32½	19
7 to 8.....	62	49½	7 to 12.....	30	17
9 to 12.....	61	48½			

Butt Weld, extra strong, plain ends

⅛	47½	31	¼ to ⅜.....+15		+48
¼ to ⅜.....	53	36½	½	25	13
½	59	48½	¾	32	18
¾	64	53½	1 to 1½.....	34	20
1 to 1½.....	66	55½			
2 to 3.....	67	56½			

Lap Weld extra strong, plain ends

2	59	48½	2	30	17
2½ to 4.....	63	52½	2½ to 4.....	33	21
4½ to 6.....	62	51½	4½ to 6.....	32	20
7 to 8.....	58	45½	7 to 8.....	25	13
9 to 12.....	52	39½	9 to 12.....	20	8

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 and 2½ per cent.

Boiler Tubes

Lap Welded Steel

1¾ in.	23½
2 to 2¼ in.....	38
2½ to 3 in.....	49
3¼ to 13 in.....	54

Charcoal Iron

1½ in. .....+	2
1¾ to 1⅞ in.....	8
2 to 2¼ in.....	18
2½ to 3 in.....	23
3¼ to 4½ in.....	25

To large buyers of steel tubes a supplementary discount of 5 per cent is allowed.

Standard Commercial Seamless Boiler Tubes

Discounts on cold-drawn tubes in carload lots, f.o.b. Pittsburgh, follow:

1 in.	57	2½ and 2¾ in.....	40
1¼ and 1½ in.....	49	3 in.	44
1¾ in.	33	3¼ to 4 in.....	49
2 and 2¼ in.....	36	4½ in. and 5 in.....	41

Hot Rolled

3 in.	46	3¼ to 4 in.....	51

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30, base, 85 per cent off list. Carbon 0.30 to 0.40, base, 83 per cent off list. Plus usual differentials and extras for cutting.

Seamless Locomotive and Superheater Tubes

	Cents per Ft.		Cents per Ft.
2-in. O.D. 12 gage.....	13	2¼-in. O.D. 10 gage....	17¾
2-in. O.D. 11 gage.....	14	3-in. O.D. 7 gage.....	33
2-in. O.D. 10 gage.....	15	1½-in. O.D. 9 gage.....	13
2¼-in. O.D. 12 gage....	15	5⅜-in. O.D. 9 gage.....	51
2¼-in. O.D. 11 gage....	16	5½-in. O.D. 9 gage.....	58

Tin Plate

Standard cokes, per base box.....$4.75

Terne Plate

(Per package, 200-lb.)

8-lb. coating	$9.30	25-lb. coating I. C.....$14.25	
8-lb. coating I. C.....	9.60	30-lb. coating I. C.....	15.25
15-lb. coating I. C.....	11.80	35-lb. coating I. C.....	16.25
20-lb. coating I. C.....	13.00	40-lb. coating I. C.....	17.25

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....2.50c. to 2.75c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.35c. to 3.75c.

Galvanized

No. 28 (base), per lb.....4.35c. to 4.75c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.35c. to 3.50c.

Manufacturers have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic.	$0.325	Buffalo	$0.265	St. Louis	$0.43
Philadelphia, export...	0.235	Cleveland	0.215	Kansas City	0.735
Baltimore, domestic...	0.315	Cleveland, Youngstown Comb.	0.19	Kansas City (pipe)...	0.705
Baltimore, export....	0.225	Detroit	0.295	St. Paul	0.595
New York, domestic...	0.34	Cincinnati	0.295	Omaha	0.735
New York, export.....	0.255	Indianapolis	0.31	Omaha (pipe)	0.705
Boston, domestic	0.365	Chicago	0.34	Denver	1.275
Boston, export	0.255			Denver (pipe)	1.215

Pacific Coast	$1.50	Birmingham	0.69
Pac. Coast, ship plates	1.20	Memphis	0.385
		Jacksonville, all rail..	0.50
		Jacksonville, rail and water	0.415
		New Orleans	0.515

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 30c. to 40c.; ship plates, 30c. to 40c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 30c. to 40c.; sheets and tin plates, 50c.; rods, wire rope, cable and strands, 75c.; wire fencing, netting and stretcher, 50c.; pipe, not over 8 in. in diameter, 50c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

AUGUST IN FABRICATED STEEL

Bureau of Census Has Figures for Five Months from 125 Firms

WASHINGTON, Sept. 19.—Sales of fabricated structural steel in August showed a slight increase over the figure reached in July, according to the Bureau of Census. August sales amounted to 65.2 per cent of shop capacity, compared with 62 per cent in July and 72 per cent in June.

Reports have been received from 125 firms for each of the five months April to August, inclusive. Those 125 firms report a total shop capacity of 208,245 tons per month. The actual sales for the past five months reported by those 125 identical firms have been as follows:

1922	Tonnage Booked	Per Cent of Capacity*
April	181,947	87.4
May	165,272	79.4
June	149,907	72.0
July	129,160	62.0
August	135,843	65.2

*The inclusion of additional firms this month has made slight revisions in the per cent of capacity reported previously.

FABRICATED STEEL BUSINESS

Drop in Volume of New Inquiry But Numerous Awards

Among the fabricated steel awards of the past week are the following:

National Theater, Richmond, Va., 350 tons, to the Richmond Structural Steel Co.

Power house for New York State at Crescent, N. Y., 300 tons, to the American Bridge Co.

Walker Hotel, Washington, 4000 tons, to the American Bridge Co.

Two wings, American Museum of Natural History, New York, 1600 tons, to American Bridge Co.

Addition to the Girard Trust Co. building, Philadelphia, 1200 tons, to the Phoenix Bridge Co.

Five bridges, Pennsylvania Railroad, 1000 tons, to the Phoenix Bridge Co.

Ballinger Building, Philadelphia, 1300 tons, to the Shoemaker-Satterthwait Bridge Co.

Magnetic Pigment Co., Trenton, N. J., 200 tons, to the American Bridge Co.

Horn & Hardart, Philadelphia, 230 tons, to McClintic-Marshall Co.

Apartment hotel, 299 Park Avenue, New York, 4000 to 5000 tons, reported awarded to the New York Ship Building Corporation, may be awarded, it is now stated, to Post & McCord.

School and church, Knickerbocker Avenue, Brooklyn, 350 tons, to A. E. Norton, Inc.

Apartment, East Eighty-sixth Street, New York, 1000 tons, to the Hinkle Iron Co.

Union Pacific system, single track through riveted spans for bridge over Columbia River, east of Hedges, Ore., 2735 tons, to American Bridge Co.

Chicago, Burlington & Quincy, bridge work, 1056 tons, to American Bridge Co.

Foundry building, Seattle, for Washington Iron Works, 611 tons, to the Austin Co., Cleveland.

Two single-track through plate girder spans for Missouri Pacific, 275 tons, to American Bridge Co.

Power house for Santa Fe at San Bernardino, Cal., 246 tons, to American Bridge Co.

Steel for housing machinery, Missouri Portland Cement Co., Prospect Hill, St. Louis County, Mo., 230 tons, to American Bridge Co.

Draw span over Nehalem River for Tillamook County, Ore., 188 tons, to Pacific Iron Works.

Tractor works, wheel shop building, International Harvester Co., Chicago, 170 tons, to unnamed fabricator.

Extension to Commonwealth Steel Co., Granite City, Ill., 163 tons, to Stupp Brothers.

Through plate girder span, Spadra, Ark., for Missouri Pacific, 135 tons, to American Bridge Co.

Buildings for Sanitary District, Chicago, 104 tons, to unnamed fabricator.

Morris & Co., Stockyards Building, Chicago, 200 tons, to A. Bolters Sons.

Eagles' clubhouse, Davenport, Iowa, 100 tons, to Davenport Machine & Foundry Co.

Auditorium, Washington, 1100 tons, to Lehigh Structural Steel Co.

Skelton Shovel Co., Dunkirk, N. Y., 150 tons, to Kellogg Structural Steel Co., Buffalo.

Odd Fellows' new building at Silver Creek, N. Y., 150 tons, to Kellogg Structural Steel Co.

National Life & Accident Assurance Co. office building, Nashville, Tenn., 500 tons, to International Steel & Iron Co.

Highway bridge, Clarksville, Tenn., 540 tons, to Nashville Bridge Co.

Highway bridge, Montgomery County, Ohio, 600 tons, to Brookville Bridge Co.

Chapel at Denison University, Granville, Ohio, 125 tons, to Mott Iron Works.

High school, Somerville, Mass., 150 tons, to the New England Structural Co., Boston.

High school, Medford, Mass., 150 tons, to the New England Structural Co.

Westinghouse Lamp Co., Bloomfield, N. J., 150 tons, to the Phoenix Bridge Co.

Power station, Bennings, D. C., 100 tons, to the New York Shipbuilding Co.

Structural Projects Pending

Inquiries for structural steel work now being figured on include the following:

Edison Co. power station, South Boston, 950 tons.

Highway bridge, Lowell, Mass., 235 tons.

Exchange National Bank, Tampa, Fla., 140 tons.

Eighteen-story addition to First National Bank Building, Chicago, 400 tons.

State Library, Lawrence, Kan., 500 tons, bids received and project postponed.

Consumers Power Co., Jackson, Mich., heating plant at Grand Rapids, 115 tons.

Indiana Quarries Co., Bedford, Ind., new plant, 600 tons, bids in.

J. A. Fay & Egan Co., new plant, Cincinnati, 900 tons, bids in.

Hotel at Bridgeton, N. J., 300 tons; general contract let to F. V. Moore, Philadelphia.

Addition to Corn Exchange Bank, Philadelphia, 300 tons; bids close Sept. 27.

Plant for the Toledo Libby-Owens Sheet Glass Co., Toledo, 5000 tons.

Baseball grandstand, Buffalo, tonnage unnamed.

Cuyahoga County grade crossing elimination, Cleveland, 500 tons.

RAILROAD EQUIPMENT BUYING

Activity in Locomotives Continues Conspicuous With Some Fresh Car Inquiries

Buying of locomotives is noteworthy, although inquiries of railroad cars and car parts continue in fair volume. Some of the notable items are as follows:

New York Central, 90 locomotives, placed with American Locomotive Co.

Baltimore & Ohio, 50 Mikado type locomotives, awarded to Baldwin Locomotive Works.

Erie Railroad, 30 additional Mikado type locomotives, placed with Baldwin Locomotive Works.

Nashville, Chattanooga & St. Louis, 7 locomotives, placed with Baldwin Locomotive Works.

The Santa Fe expects to enter the market for 100 locomotives and the Rock Island and the Burlington for about 50 each. The Duluth & Iron Range is inquiring for 8 Mikado type engines.

The Western Maryland is inquiring for 10 consolidation type engines.

The Chesapeake & Ohio is in the market for 50 Mallet type locomotives.

The Norfolk & Western has placed 12 Mallet type engines with Baldwin Locomotive Works.

Fruit Growers Express Co., 1000 underframes under inquiry.

Baltimore & Ohio, in the market for 30 baggage cars.

Chicago & Northwestern, in market for 800 50-ton gondolas and 200 55-ton flat cars.

Norfolk Southern, inquiring for 240 steel center constructions.

Champlin Refining Co., Enid, Okla., ordered 500 tank cars of Pennsylvania Tank Car Co., Sharon, Pa.

The Chicago & Eastern Illinois has placed 17 baggage cars with the Pullman Co.

The Illinois Central has placed 75 caboose cars with the American Car & Foundry Co.

The Pittsburgh Street Railways Co. is inquiring for 100 street cars.

NON-FERROUS METALS

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
Sept.	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
13.....	14.12½	13.75	32.20	6.05	5.70	6.75	6.40
14.....	14.12½	13.75	32.12½	6.10	5.75	6.80	6.45
15.....	14.12½	13.75	32.12½	6.12½	5.80	6.85	6.50
16.....	14.12½	13.75	....	6.12½	5.80	6.90	6.55
18.....	14.12½	13.75	32.12½	6.12½	5.80	6.95	6.60
19.....	14.12½	13.75	32.12½	6.25	5.90	7.00	6.65

*Refinery quotation.

New York

NEW YORK, Sept. 19.

The most inactive and dullest of the markets is tin, but the rest show different degrees of activity and strength. The copper market is moderately active and strong. Pronounced activity and advancing prices characterize both the lead and zinc markets. The antimony market is also strong.

Copper.—Producers and selling agencies report a good business in copper almost daily but prices have not increased though they have become firmer and the absence of any cheaper lots is pronounced. There is also a very good demand for export. Electrolytic copper is firm at 14c., delivered, or 13.75c., refinery, for the balance of the year. Not much interference with deliveries is reported because of railroad transportation conditions.

Tin.—On only two days in the past eight has there been any activity in the Straits tin market. The principal feature of the market has been that there were sellers at 32.12½c. and buyers at 32c. with difficulty as to an agreement as to a sale price. The fairly liberal sales referred to in this paragraph a week ago, as having been made Sept. 12, amounted to about 500 to 600 tons of Straits tin. On Sept. 13 there was also some business amounting to 250 to 300 tons. On other days the conditions referred to prevailed because of the relative attitude of sellers and buyers. It has been believed in the market that when the price reached 32c. there would be a rush to buy but this was only partly realized on Sept. 12. The market today has been moderately active with the quotation at 32.12½c., New York, for spot Straits. The London market today was approximately the same as a week ago at £158 15s for spot Standard, £159 17s 6d for future Standard and £159 per ton for spot Straits. Arrivals thus far of this month have been 3350 tons. The quantity afloat is reported as 7728 tons.

Lead.—A heavy demand resulting in a very strong market has characterized the week. The American Smelting & Refining Co. advanced its prices on Sept. 14, 10 points to 5.80c., St. Louis, or 6c, New York, and again today to 5.90c., St. Louis, or 6.10c., New York, but the outside market has advanced almost daily until today the sales have been made up to 5.90c., St. Louis, or 6.25c., New York. Practically all sellers have disposed of their September production and in some cases their October output has been heavily sold. Undoubtedly a scarcity of the metal is likely to develop.

Zinc.—The advancing tendency of the market noted a week ago has gone on rapidly until prime Western for early delivery is difficult to obtain. Sales were made today at 6.65c. to 6.70c., St. Louis, or 7c. to 7.05c., New York, the advance having been progressive practically every day since a week ago. The increase in quotation for the week represents about 30 points. The metal is selling higher than at any time in 1921 or since. Difficulty in obtaining ore as well as labor, together with coal and transportation hindrances, are the controlling causes, accentuated of course by an increased demand from consumers. Producers have sold practically all of their September output and some of their October, as in the case of lead.

Antimony.—Wholesale lots of Chinese metal for early delivery are quoted at 6.75c. per lb., New York, duty paid.

Aluminum.—The leading producer continues to quote wholesale lots of virgin metal, 98 to 99 per cent pure, for early delivery at 19.10c. per lb., f.o.b. plant, with the same grade offered by importers and produced in various foreign countries at 17.75c. to 18c. per lb., duty paid, New York.

Old Metals.—The market continues strong, but business appears to be marking time. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	13.50
Copper, heavy and wire	12.75
Copper, light and bottoms	11.25
Heavy machine composition	10.50
Brass, heavy	8.25
Brass, light	6.50
No. 1 red brass or composition turnings	9.00
No. 1 yellow rod brass turnings	7.50
Lead, heavy	5.00
Lead, tea	4.00
Zinc	4.00

Chicago

Sept. 19.—Lead, zinc and antimony have advanced in a quiet market. The strength in lead and zinc is attributed to the long idleness of numerous smelters. The old metals remain unchanged. We quote, in carload lots, lake copper, 14.25c.; tin, 33.50c. to 34c.; lead, 5.95c.; spelter, 6.70c.; antimony, 8.50c., in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips,, 11c.; copper bottoms, 9.25c.; red brass, 8.75c.; yellow brass, 6.75c.; lead pipe, 4.50c.; zinc, 3.75c.; pewter, No. 1, 20c.; tin foil, 22.50c.; block tin, 26c., all buying prices for less than carload lots.

St. Louis

Sept. 19.—The lead market was strong during the week at an advance of 15 points, while slab zinc was firm and 25 points higher. We quote carlots: Lead, 5.80c.; slab zinc, 6.50c. On old metals we quote: light brass, 3.50c.; heavy red brass and light copper, 7c.; heavy yellow brass, 4c.; heavy copper and copper wire, 7.50c.; zinc, 2c.; pewter, 15c.; tin foil, 16c.; tea lead, 2c.; aluminum, 9c.

Effects of Railroad Congestion in the Youngstown District

YOUNGSTOWN, Sept. 19.—Congestion at shipping platforms of sheet rolling plants because of car shortage may force curtailment of production, as rollers are disinclined to accumulate large stocks of the finished product against possible decline in buying.

President James A. Campbell of the Youngstown Sheet & Tube Co. believes railroads will be able to deliver coal in sufficient quantities to maintain independent production in this territory at 70 per cent. The company will not re-light its two Hubbard blast furnaces until after the close of navigation. Mr. Campbell looks for continued interruption to shipping through the winter because of inadequate condition of locomotive equipment.

The A. M. Byers Co. has arranged to secure Connellsville beehive coke for its Girard stack scheduled to be blown in this week. The Republic Iron & Steel Co. is preparing its Hannah furnace at Youngstown and the fifth stack in its Hazleton group for re-lighting.

The Atlas Steel Corporation will be the name of the new company to be formed by the merger of the Electric Alloy Steel Co., Youngstown, Ohio, and the Atlas Crucible Steel Co., Dunkirk, N. Y., producers of high-speed and special analysis steels. Gross capital assets of the two constituents are about $12,000,000. Until completion of the merger the companies are operating under unified management, with L. J. Campbell, president of the Electric Alloy company, as chairman of the board and chief executive officer, located at Dunkirk.

Philadelphia Iron and Steel Market

(*Continued from page* 750D)

Pennsylvania steel company; 2000 tons of basic to a New England wire company at about the same price; 5000 tons of gray forge iron to a maker of bar iron at well above $30, furnace, this iron, however, being of special quality, and 1000 tons of No. 2X to an electrical machinery manufacturer at $33, furnace. A Virginia cast iron pipe manufacturer is reported to have placed an order for a substantial tonnage with a Virginia furnace which will be blown in shortly. The Midvale Steel & Ordnance Co. will blow in a second furnace at Coatesville on Oct. 1, which will operate for at least two weeks on foundry iron, which is being offered for sale, and the same company now has five stacks in blast at its Johnstown plant and a sixth will be blown in next Sunday. Foundry iron is also being offered for shipment from Johnstown. The Alan Wood Iron & Steel Co. is having its No. 3 furnace relined and as soon as this work is completed it will be blown in. Prospects of regular merchant furnaces becoming active are not bright under present conditions in the coke market.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia, and include freight rates varying from 76 cents to $1.64 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$33.26 to $35.64
East. Pa. No. 2X, 2.25 to 2.75	34.26 to 36.64
East. Pa. No. 1X	35.26 to 37.64
Virginia No. 2 plain, 1.75 to 2.25 sil.	37.17
Virginia No. 2X, 2.25 to 2.75 sil.	38.17
Basic delivered eastern Pa.	31.00 to 33.00
Gray forge	31.00 to 33.00
Malleable	35.00 to 36.00
Standard low phos. (f.o.b. furnace)	38.00 to 40.00
Copper bearing low phos. (f.o.b. furnace)	37.00 to 38.00

Ferroalloys.—Car load lots of resale ferromanganese have been sold at $85 and $90, seaboard. For forward delivery importers of British ferromanganese continue to offer at $67.50, seaboard, the buyer to pay the new duty. The New Jersey Zinc Co. is keeping its furnace in blast on spiegeleisen, having obtained coke from abroad, and is offering the 16 to 19 per cent grade at $38 and the 19 to 21 per cent grade at $39, furnace.

Semi-Finished Steel.—Prices quoted for semi-finished steel are firm. Rerolling billets can not be obtained for less than $40, Pittsburgh, nor forgings billets for less than $45, while on some lots higher prices have been paid. A sale of 1000 tons of forging billets at $47.50, Pittsburgh, is reported. The American Locomotive Co. is in the market for about 5000 tons of forging billets of special quality.

Rails.—Nearly all of the Eastern railroads are figuring on their 1923 rail requirements, and although formal inquiries have not been issued in all cases, it is expected that the Pennsylvania will require about 200,000 tons, the Philadelphia & Reading, 13,000 tons, the Norfolk & Western, 25,000 tons. The Baltimore & Ohio will also buy, but its tonnage has not been named. Eastern companies which roll rails have quoted on 200,000 tons for the New York Central. Light rails are in good demand at 2.25c., Pittsburgh.

Plates.—Locomotive buying is responsible for most of the important plate demand. About 4000 tons has been placed by the Baldwin Locomotive Works for the 100 engines recently ordered by the Pennsylvania Railroad; about 2000 tons for 50 ordered by the Baltimore & Ohio; about 1000 tons will be required for 30 additional locomotives ordered by the Erie; the Norfolk & Western has contracted for 12, and the Nashville, Chattanooga & St. Louis for 7. The Chesapeake & Ohio is inquiring for 50. Otherwise plate orders are in small volume, and mills which are quoting 2.25c. to 2.50c., Pittsburgh, are not finding it easy to book orders except in very small lots. The minimum on plates appears to be 2.10c., Pittsburgh, quoted by only one mill, but some others have named 2.15c. and 2.20c. on desirable lots. Plate production at Eastern mills is increasing. The Midvale plant at Coatesville will this month turn out about 15,000 tons, which is slightly more than 50 per cent of capacity. We quote sheared plates at 2.10c. to 2.50c., Pittsburgh.

Structural Steel.—Prices on fabricated steel work are working lower. An office building in Philadelphia, for which contract has been let, went at $81, erected, which was about $10 per ton below the next lowest price. Several structural jobs in the Philadelphia district which have been let are reported in another column. Plain material is quoted from 2.10c. to 2.25c., Pittsburgh.

Bars.—Steel bars are selling from 2c. to 2.25c., Pittsburgh, but it is becoming more difficult for the mills quoting 2.25c. to get that price and some concessions of $2 or $3 a ton have been made. Business is in moderate volume. One mill is quoting bar iron at 2.15c., Pittsburgh, but others in the East ask 2.25c. for carload lots.

Sheets.—The new level of prices on sheets is 2.75c. for blue annealed, 3.75c. for black and 4.75c. for galvanized, all base Pittsburgh, with lighter gages of galvanized having been quoted as high as 4.90c. Many consumers are covered at the former prices, but some business has been done for early shipment at the higher level.

Warehouse Business.—Local jobbers have advanced cold rolled steel $5 a ton. Other prices are unchanged. We quote for local delivery as follows:

Soft steel bars and small shapes, 2.90c.; iron bars (except bands), 2.90c.; round edge iron, 3.10c.; round edge steel, iron finish, 1½ x ½ in., 3.10c.; round edge steel planished, 3.85c.; tank steel plates, ¼-in. and heavier, 3c.; tank steel plates, 3/16-in., 3.20c.; blue annealed steel sheets, No. 10 gage, 3.85c.; black sheets, No. 28 gage, 4.60c.; galvanized sheets, No. 28 gage, 5.75c.; square twisted and deformed steel bars, 3c.; structural shapes, 3c.; diamond pattern plates, ¼-in., 4.80c.; 3/16-in., 5c.; spring steel, 4.25c.; round cold-rolled steel, 3.35c.; squares and hexagons, cold-rolled steel, 4.35c.; steel hoops, No. 13 gage and lighter, 4.10c.; steel bands, No. 12 gage to 3/16-in., inclusive, 3.70c.; rails, 2.90c.; tool steel, 8.50c.; Norway iron, 5.50c.

Coke.—Much to the surprise of those who had expected that coke prices would continue to show declines because of better coal supply, the market has stiffened within the past few days, due, it is stated, to inadequate car supply rather than to lack of coke. Whereas a week ago furnace coke was offered at $10, Connellsville, it now is quoted at not less than $11, and foundry coke is also $1 a ton higher at a minimum of $13, Connellsville. By-product coke is offered at $13.50 to $14, Swedeland, Pa.

Old Material.—There have been advances on nearly all grades of scrap from 50c. to $3 or more a ton on top of similar advances which were recorded a week ago. A strong demand, coupled with rising prices, has created an excited market. Brokers are freely offering $21, Pittsburgh, for No. 1 heavy melting steel and $18, delivered at eastern Pennsylvania steel works. The Alan Wood Iron & Steel Co. bought 10,000 tons at this price, and the market advanced so rapidly that the sellers, it is reported, were unable to cover fully at a profit. Our quotation on low phosphorus scrap has been advanced $3.50 a ton, based on a sale of 1000 tons of plate croppings at about $25.50, delivered, while an Eastern mill has quoted $26, f.o.b. mill, on a tonnage of billet crop ends.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$18.00 to $18.50
Scrap rails	18.00 to 18.50
Steel rails for rolling	21.00 to 22.00
No. 1 low phos., heavy 0.04 and under	25.50 to 26.00
Cast iron car wheels	23.00 to 24.00
No. 1 railroad wrought	22.00 to 23.00
No. 1 yard wrought	20.00 to 21.00
No. 1 forge fire	16.00 to 16.50
Bundled sheets (for steel works)	15.50 to 16.00
No. 1 busheling	14.50 to 15.50
Turnings (short shoveling grade for blast furnace use)	14.00 to 15.00
Mixed borings and turnings (for blast furnace use)	14.00 to 15.00
Machine-shop turnings (for steel works use)	16.00 to 16.50
Machine-shop turnings (for rolling mill use)	17.00 to 17.50
Heavy axle turnings (or equivalent)	17.00 to 17.50
Cast borings (for steel works and rolling mills)	16.50 to 17.50
Cast borings (for chemical plants)	23.00 to 25.00
No. 1 cast	23.00 to 24.00
Heavy breakable cast (for steel plants)	21.00 to 22.00
Railroad grate bars	16.00 to 16.50
Stove plate (for steel plant use)	16.00 to 16.50
Railroad malleable	15.50 to 16.50
Wrought iron and soft steel pipes and tubes (new specifications)	16.50 to 17.00
Shafting	23.00 to 24.00
Steel axles	28.00 to 30.00

PERSONAL

J. G. Carruthers, manager of sales, Chicago district, Illinois Steel Co. and special sales agent Carnegie Steel Co., with headquarters at Chicago, has resigned to become general sales manager of the Otis Steel Co., Cleveland. Mr. Carruthers was born at Covington, Ky., Feb. 9, 1878. His first connection with the steel industry was with the Columbus Bridge Co., Columbus, Ohio, of which he was secretary. From Columbus he went to Cincinnati, where he was assistant manager of sales Cambria Steel Co. In 1908 he was appointed manager of sales the Cincinnati district office Carnegie Steel Co., remaining in that position until 1919, when he went to Chicago to take the office he is now leaving. He succeeds D. W. Glanzer, resigned, who has been associated with the sales department of Otis Steel Co. for over 20 years.

J. G. CARRUTHERS

David T. Buffington, of the structural and plate bureau, general sales department, Illinois Steel Co., has been appointed manager of sales, Chicago district, for that company and special sales agent of Carnegie Steel Co., with offices at Chicago, succeeding J. G. Carruthers, resigned.

Gustavus Pratt has been in the employ of the Stanley Works, New Britain, Conn., for 60 years. Mr. Pratt's father was employed in the same company for 65 years, the combined service being 125 years. In these times of unusual labor turnover, this record of long and efficient service is noteworthy.

GUSTAVUS PRATT

H. T. Burrows, Appleton, Wis., has been elected secretary Malleable Iron Range Co., Beaver Dam, Wis., to fill the vacancy caused by the death of A. S. Bowron. Mr. Burrows for some time has been associated with the Fox River Valley Paper Co., Appleton.

George R. Fink has resigned as general sales manager West Penn Steel Co., Brackenridge, Pa., to become affiliated with a new company which will build a sheet plant in Detroit.

J. Fred Townsend, traffic manager National Tube Co., Pittsburgh, has been elected vice-president of the Lake Terminal Railroad, the McKeesport Connecting Railroad and the Benwood & Wheeling Connecting Railroad, rail subsidiaries of the National Tube Co.

Harry J. Foss has been elected president of the Berkshire Mill Supply Co., Pittsfield, Mass., filling the vacancy caused by the recent death of Charles E. Hibbard.

Louis H. Egan, president Union Electric Light & Power Co., St. Louis, has been elected president of the Union Colliery Co., a subsidiary of the electric company, to succeed Eugene McAuliffe, resigned. Frank J. Boehm, vice-president and L. E. Young, manager of the steam heating department of the electric company, have been made vice-president and general manager respectively of the colliery company.

R. A. DeVlieg has resigned his position as chief engineer and factory manager of the Handley-Knight Co., Kalamazoo, Mich., to become tool engineer of the Maxwell Motor Corporation, Detroit.

W. S. Rugg, assistant to vice-president, Westinghouse Electric & Mfg. Co., has been appointed to the newly created position of general manager of sales of that company.

E. K. Morgan, general superintendent Rockford Drilling Machine Co., has resigned his position to assist in supervising the design of special machinery for the Ingersoll Milling Machine Co., also of Rockford, Ill. He retains his financial interest in the Rockford Drilling Machine Co., and is still a member of its board of directors.

OBITUARY

Death of H. H. Campbell

HARRY HUSE CAMPBELL, for years superintendent and general manager of the Pennsylvania Steel Co. at Steelton, Pa., died last week at the age of 63. Following his graduation from Massachusetts Institute of Technology, he took up work at Steelton in a minor capacity, and for practically all his career in steel making he was identified with that plant. As metallurgical engineer he was connected also with the kindred companies, the Maryland Steel Co. and the Spanish-American Iron Co. Mr. Campbell's most important investigations were into the principles and practice of the open-hearth steel process, these being embodied in his well-known work, "The Manufacture and Properties of Steel." For the past twelve years, due to serious illness, he has lived in retirement. More extended reference to Mr. Campbell's work will be made in a subsequent issue.

H. H. CAMPBELL

FRANK ADAM, chairman of the board, Frank Adam Electric Co., pioneer manufacturer of electrical goods in St. Louis, died there recently. Mr. Adam came from Germany to the United States in 1853 and went to St. Louis in 1865. He entered the electrical business in 1890.

THOMAS BEADLING, SR., president, North East Coal Mining Co., and treasurer, Colonial Coal & Coke Co., died at his home in Crafton, Pa., Sept. 13. He was an active figure in the coal and coke business in Pittsburgh for many years.

Steel Mill Equipment Orders Placed

The Otis Steel Co., Cleveland, has placed orders for the following additional equipment for its new steel plant: Hot strip mill to the United Engineering & Foundry Co.; 10 cold rolls with the Mesta Machine Co.; five with the Philadelphia Roll & Machine Co. and with the Farrel Foundry & Machine Co.; six strip mill cranes with the Morgan Engineering Co. and a 10,000 kw. turbo-generator and blooming mill and sheet bar mill motors with the General Electric Co.

Evening and Saturday afternoon courses in engineering, beginning Monday evening, Oct. 2, are announced by New York University (engineering section, extramural division, University Heights), New York. The bulletin gives information as to the courses, requirements of admission and tuition costs.

Features of Modern Blast Furnace Practice

(*Concluded from page* 734)

was not over 550 it was not possible to file them. He mentioned these examples in relation to the method of using Brinell as some indication of the successful hardening properties of high speed steel. These statements were rather startling, and he would suggest that quite a number of the members of the institute would like to have small samples of these materials which could be easily filed at Brinell number 650, but which could not be filed at Brinell number 550.

V. STOBIE, Durham, also referred to the point Mr. Brearley had mentioned about not making commercial high-speed steel from turnings. One could not go on getting high-speed steel from scrap, and must start to make something from raw materials. He had had a lot of experience in this direction and had made ten-ton charges of high-speed steel from turnings and had not found the difficulties mentioned in the paper, nor did he find anything like the losses Mr. Ogilvie mentioned. The paper told them that they must expect anything between ten and twenty per cent loss on turnings, if they were going to make high speed steel, but he did not think that the average would be anything like that. It would rather look as though Mr. Ogilvie had not had the best metallurgical conditions in his furnace. That seemed to be proved when he said that if he used high-speed scrap most of the vanadium would have been removed. That was totally unnecessary nowadays. He had plenty of instances where they had melted scrap containing 1 per cent of vanadium and 0.8 was easily left in the bath. When told that it was impossible to use turnings in this country and make the thing commercially practicable one must ask what the experience was on which such an opinion had been founded. He would rather suggest that Mr. Ogilvie see what could be done elsewhere before he turned down as uncommercial the method which alone could give them new material.

Flow of Steels

J. H. S. DICKENSON, Sheffield, presented a paper on the flow of steels at a low red heat, giving details of recent developments in the manufacture of metallic containers capable of withstanding considerable stress at elevated temperatures for long periods. It was found that the nickel-chromium alloy selected for synthetic ammonia producers was better able to resist occasional and intermittent heavy loads at high temperatures than the next best metal, a high-speed steel. Next in order came high chromium steel, with nickel-chrome steel, and 0.3 per cent carbon steel lowest. The most remarkable resistance to oxidation was shown by the nickel-chromium alloy, the next in rate of scaling being the 14 per cent chromium steel, then the high nickel (25 per cent), with high-speed (tungsten), nickel-chrome steel and carbon steel in that order.

In the subsequent discussion H. Brearley remarked that the results which Mr. Dickenson had set out appeared to extend very considerably the knowledge of the properties of steels at high temperatures over and above that type of knowledge that may be obtained by making an ordinary tensile test piece. The paper had focused attention on the behavior of structural parts at high temperatures. He (Mr. Brearley) thought that for most of them the interest of the properties of steels at high temperatures rather resided in the relative difficulty or ease with which they could be deformed under rolls and hammers and so on, and in this particular respect he drew attention to the results of a number of tests which could be very simply made, but which were extremely difficult to explain. He produced a ¼-in. steel bar—almost any kind of steel, so far as he knew, would serve—which had been raised to a temperature of about 1000 to 1100 deg. C. at one end, and then the heat had been allowed to taper down until, 2 in. from the colder end, it was perhaps about 600 C. This bar was gripped at the hot end in a vise, and then on the other end was put an ordinary joiner's brace, and the bar was twisted. One would naturally expect, from all tensile determinations made on steels at high temperatures, that the bar would twist most where it was hottest. What happened in nearly all cases was that where it was hottest they got a twist of a short pitch, and then somewhere down the metal they got a twist of a longer pitch, and then they got a twist of the shortest pitch of all where the end was coldest.

A long paper by G. A. V. Russell on "Reversing Cogging Mills: Their Drives and Auxiliary Equipment" was withdrawn before the meeting. Other papers were very briefly discussed.

Visits were paid to the works of the Staveley Coal & Iron Co., Ltd., and to the works of the Parkgate Iron & Steel Co., Ltd., while on Tuesday W. McConway gave a film demonstration descriptive of his new process for the production of steel discs by centrifugal methods direct from molten steel.

New England Foundrymen's Association

At the September meeting of the New England Foundrymen's Association, held Sept. 13, at the Exchange Club, Boston, cupola practice was the subject under discussion. One of the most important points brought out was that too many foundries relied on common labor to make proper charges in cupolas, whereas instructions often were not closely followed, which resulted in unsatisfactory castings. The opinion was expressed that some person in authority, preferably a foreman, should be maintained on the charging floor.

The executive committee of the association have arranged for a number of addresses by some of the best and most prominent men connected with the foundry industry, during the coming season. H. P. Blumenauer, Arcade Malleable Iron Co., Worcester, Mass., at the October meeting of the association, will deliver an address on handling of materials around the shop. George A. Ray, Taylor-Fenn Co., Hartford, Conn., vice-president of the association, presided at the September meeting in the absence of E. H. Ballard, president.

Plant Observes Fiftieth Anniversary

On Sept. 13, 1872, the first pipe was turned out at the McKeesport, Pa., plant of the National Tube Co., and last Wednesday, the fiftieth anniversary of that event was observed by officials and veteran employees. Among the latter were two who were employed at the plant at its opening and who still are in active harness, Daniel Turley and Patrick Bligh.

The first product of the plant was 2-in. boiler tubes. Now the range of products includes all kinds of tubular goods, of sizes running from ⅛ in. to 30 in. in diameter. The original plant occupied only four acres and consisted of one small building. There are now scores of buildings, one of which is the largest mill under one roof in the world, while the plant as a whole is the largest devoted to tubular products in the world. The number of employees has increased from 100 in 1872 to between 7000 and 8000, and the monthly pay roll, which 50 years ago was about $11,000, now runs up to $1,000,000 when the plant is running full. From 10 car loads a day, production has grown to an average of 100 car loads, and as high as 150 car loads have been produced in one day.

The first general manager of the plant was John H. Flagler, who died recently in Greenwich, Conn. His successors in that position have been the late E. C. Converse, Horace Crosby, G. G. Crawford, William B. Schiller, now president of the National Tube Co., and Taylor Allderdice, now vice-president in charge of operations of the company, while the present general manager is William A. Cornelius.

The Tourist Camp Body Co., Inc., 1726 Prairie Avenue, Chicago, was recently incorporated with a capital stock of $10,000, to manufacture automobile bodies. It is building a plant at the above address. It will build bungalows on wheels, including kitchenette equipment, heating systems and electric lighting. The sheet metal work will be let out to contract. The incorporators are: G. B. Haskell, C. Oscar and H. Joshims.

Control of Raw Material to Suit Output

(*Continued from page 716*)

requisition, Fig. 7, which is the order on the stores department to give the factory the stock required for a certain number of pieces of a specified part. Thus, the requisition for 10,000 pieces of part No. C-88 calls for 112 lb. of ⅝-in. screw rod. This material is given to the foreman of the first department to work on the manufacture of the part, in this case Dept. No. 3.

How the Production Department Is Managed

In the manufacturing methods employed in the plant are observed the same careful principles which are applied in the control of raw and finished material stocks. One feature which impresses the visitor is the paucity of special purpose machines. The explanation lies in the determination of the management to attain efficiency without sacrificing flexibility in production. In other words, the introduction of changes in typewriter design is rendered difficult when special manufacturing machinery is used, because it may require the purchase of entirely new equipment and scrapping the old. On the other hand, alterations in the product are relatively easy to effect with standard machines, as all that is required is the use of new dies, jigs or fixtures.

For the manufacture and repair of dies, jigs and fixtures, as well as circular tools for screw machines, the company has a well-equipped tool room. The benches of the tool makers are placed next to the windows so that they have the best of light. The grinding department is set off in an inclosed chamber in one corner. The tool room also has its own individual hardening department which, because it needs light the least, is located in a part of the room farthest from the windows. Replacements and repairs constitute the principal output of the tool room, as the bringing out of a new typewriter model calls for so much new tooling that purchases must be made outside.

All large tools are kept in a fireproof vault when not in use. There are three compartments in the vault, one for dies, one for jigs and fixtures and a third for circular tool sets. The dies and the jigs and fixtures are stored in metal racks, and are arranged according to the parts of the typewriter for which they are used, being identified by both alphabetical and numerical designations. In addition, the dies are differentiated, as to whether they are used for forming or blanking, by the word "form" or "blank." The screw machine tools are arranged in drawers according to the commoner jobs. This scheme is to prevent unnecessary duplication of tools, as one combination of cams may be used for several jobs and likewise a cam in one drawer may sometimes be used in combination with others in different drawers. Both the tool foreman and the master mechanic have records indicating the location of the tools making up all the combinations used.

All of the smaller tools, such as milling cutters, reamers, slitting saws, taps and dies, drills and counterborers, are purchased, as this is cheaper than to make them. These tools are kept in a tool crib adjacent to the vault. An accurate record, of course, is kept of all tools requisitioned by the production department.

Situated near the tool crib and vault, the raw material store room is, like them, conveniently located with reference to the production department. In point of quantity the two principal materials stored are cold rolled strip steel, from which all stampings are made, and cold drawn steel bars, from which the screw machine products are manufactured. Here also is kept all the tool steel used by the tool room. In filling the daily requisitions for this material, received from the tool room foreman, the store department cuts the steel to length in a hack saw machine. Occasionally, when large diameter material is called for, it is necessary to use a large band saw located in the tool room. All purchased miscellaneous parts, such as wooden cores for the typewriter platens, rubber covers for the platens, knobs, key rings, etc., as well as general factory supplies, are kept in the store room. On an adjacent covered platform castings are stacked to season.

The raw material room is connected by a short aisle with the punch press and screw machine sections of the factory, which are the two primary departments for the production of small parts. Most of the other departments are devoted to secondary or finishing operations, with the drilling, milling, vertical grinding, riveting and polishing machines, and the plating, japanning and hardening divisions of the plant.

Every part of a typewriter is protected in some manner from rust—by white nickeling, black nickeling, oxidizing or japanning. But the precautions taken against rust are no greater than the care exercised in inspection of the parts as they come from the various machines. In some instances, of course, examination by the eye suffices, but parts which must be within close limits are measured with calipers, blueprints indicating the maximum permissible tolerances for the parts being before the inspector while he is measuring.

Castings for the heavier parts of the typewriter are bought outside. There are four main castings in a machine—base, top plate, carriage frame and subframe. Each is machined in a department by itself, for the reason that frequent movement of a bulky material is poor shop practice. The polishing and japanning of the castings must of necessity be done in separate departments devoted to this work, in the one case because of the dust generated and in the other because the parts must be baked in ovens. To minimize the movements between these divisions, therefore, the top plate, sub-frame and base departments are situated between the polishing and the japanning rooms. As the carriage frame is neither polished nor japanned, it is handled in another part of the plant. The operations on the three heavy parts just referred to are similar. First, fins are snagged off and the rust is polished off, whereupon the castings are brought to their respective departments and profiled, drilled and milled—generally in the order stated. The last step is the japanning.

Because of both the relative bulk and the expensiveness of the castings, the production system is arranged so that each part is manufactured by daily quotas. The castings thus are kept moving through the plant, with the result that parts are passing simultaneously through each step in the various finishing operations. This differs from the principle observed in the manufacture of small parts, as already explained. The stock of two-thirds or three-fourths of the small finished parts is normally above minimum, while the remainder will be below—a signal for replenishment.

All completed parts are kept in what is known as the finished stock room. This department has two divisions, one containing all minor units and such single parts as go directly into the final assembly of the typewriter, the other embracing all parts which are entirely finished in themselves but must be assembled into minor units before going into the final typewriter assembly. The assembling of these minor units is done in a department located as near the stock room as proper lighting accommodations permit.

Nesting Done by Women Only

Final assembly of the typewriter is performed in a bay with ample light both from roof monitors and continuous sash in the side walls. In the first stages of the assembly the work is divided into three separate sections according to the three major parts, i.e., the base, top plate and carriage castings. These depart-

ments are parallel to each other and lead into a fourth department where the three units are joined together and various other small parts are inserted.

One of the small assemblies which precedes the complete joining of all parts is "nesting." This consists of fitting all of the 42 typebars so that each will strike exactly "true" in the center of the typebar guide of the machine. To accomplish this the bar is slightly bent or twisted by specially designed pliers. The result required is that each bar fits in the guide so that a piece of cigarette paper will slip past either side without binding or without being loose. This work is extremely exacting and requires an unusual co-ordination of brain and fingers which, it has been found, is possessed only by women. Men tried at this work have failed and, even among women, the number who succeed is not over one in ten.

After the typewriter is completely assembled it passes to the aligning department, where the keys are adjusted so that all letters and figures when typed on a page are on a straight line; thence to the adjusting department, where adjustments are made to obtain a uniform touch for all keys; next to an inspection department, and finally to a dust-proof stock room, from which the machines are withdrawn to be boxed and shipped.

As has just been observed, there is certain work for which women are better adapted than men. In fact, fully one-third of the 500 employees are of the gentler sex. Often they are the daughters or sisters of other operatives and, in some instances, their wives. As typewriter manufacture is the only industry in the city of Woodstock, a community of 6000 people, 50 miles Northwest of Chicago, a large stable body of skilled typewriter mechanics is being developed, with the likelihood that individual families will become as closely identified with the work as is now the case in certain industrial centers in the East, where for generations son has succeeded father in his craft. The population is thoroughly American in the sense that direct foreign ties date back at least to the parents and are no longer strong.

Radical ideas such as make headway among unskilled aliens gain no foothold in this community. As a matter of fact, there is little work about a typewriter plant that might be termed common labor. Most operations require considerable skill, with compensation proportionate, and superior skill is recognized by a piece-work basis of pay. Some work, of course, is of such a character that it cannot be placed on a piece rate scale, and straight hourly wages are therefore paid. The extent and manner of compensation, however, is not the sole factor affecting the psychology of the employees. The personal relations between management and operatives, who know each other as only neighbors in a small town can, and mingle in a spirit of friendly fellowship, have done much to simplify the industrial relations problem.

The Woodstock Typewriter Co. is a growing institution. In 1918 its production was 35 typewriters daily. An addition, housing the present assembly department, was completed in the winter of 1920, and to-day the output is 100 machines per day. It is evident, therefore, that the careful manner in which both raw material and finished stocks are controlled, the well-worked out organization of the production and assembly departments, and the attention paid to employee personnel are producing results.

Scrap Shortage Predicted by Dealers

Is there a potential shortage of steel scrap? Scrap brokers and large dealers who have canvassed the situation thoroughly claim that there is apt to be less scrap this fall than the steel mills will require and that a steadily advancing market is inevitable. Some mills have stored large quantities of scrap which was bought when prices were low. One Eastern mill has a sufficient quantity on hand for several months' operation, but this is not the situation generally.

An eastern scrap company in analyzing the situation finds that the mills in the East, not including those in the Pittsburgh-Johnstown-Youngstown district, are consuming about 90,000 tons of steel scrap a month, and all of these mills are at present active buyers.

This scrap company says that there is practically no steel scrap left in the hands of the small dealers. There are some large stocks held by large dealers, but it is estimated that these stocks in the aggregate are not more than one month's supply for the eastern mills.

Scrap dealers continue to point to the wide spread in the prices of basic pig iron and steel scrap, a difference of $13 a ton in the Pittsburgh market; $11.50 in the Youngstown market, and at least $14 in eastern Pennsylvania, based on last week's market prices. They say that under more normal conditions of steel plant and blast furnace operation it is inevitable that pig iron shall come down and scrap go up, or that both these movements will develop.

Relief for any threatened shortage of scrap must come chiefly from the railroads and it is probable that large stocks will be available from that source between now and the time snow flies if the resumption of work by shop mechanics results in the speedy repair of a large number of cars and locomotives. The difficulties which the transportation companies have had incident to the shopmen's strike have prevented many of the roads from gathering their usual offerings of scrap.

First Progress Report on Gage Steel Investigation

A program for laboratory work on the wear of gage steels, to be conducted at the Bureau of Standards has been prepared. Arrangements have been made with Dr. John A. Mathews, president Crucible Steel Co. of America, to get a supply of 1.10 per cent carbon and 1.40 per cent chromium-steel for hardening experiments and wear tests and of 0.45 per cent carbon steel for testing the wear of hard disks against soft. As the chromium-bearing steel is at present the most universally used gage steel, it is planned to make the most elaborate tests on it.

While waiting the receipt of appropriate steels for the study of hardening problems, some quenching experiments have been made to determine the characteristic curves, cooling power, and reproducibility of the common quenching media. The heat treatment of several steels in the form of 4-in. cylinders has been studied with the principal object of determining the effect of rate of heating on the dimensional changes. Some of these cylinders showing large dimensional changes on hardening are being measured for time changes.

Labor Conditions in Pennsylvania

PITTSBURGH, Sept. 19.—Restricted immigration is responsible for a general shortage of competent labor in the steel and construction industries, according to the reports of the Pennsylvania State employment agencies. Reports show that as of Sept. 1 the unemployed in the State totaled 32,770, which compares with 125,000 registered for jobs on July 1.

The strike of more than 300 employees of the Steel Car Forge Co., Ellwood City, Pa., was settled Sept. 9 when laborers were given a 20 per cent increase, skilled workmen an increase of 6c. per hour and piece workmen a proportionate increase. The strike was on two weeks.

Labor Problems in Electric Melting

(*Concluded from page 725*)

disconnecting knife switches on the primary side without making use of the insulated stool or the rubber gloves provided. That they do not care to take the time or expend the energy to play safe should be reason for immediate discharge. If this careless disregard of human life is tolerated from one workman, it is not long before the "disease" spreads among the others.

Things Not to Do

To promote the best results a set of rules should be posted together with a series of "Don'ts." Some of the latter should read: "Don't throw in the main switch while men are working on the furnace roof"; or "Don't touch the relay coils on the automatic regulators, as the electrician is here for that purpose"; or "Don't try to slip an electrode with the power on." It may seem strange that such matters must be kept constantly before the workmen; and indeed it is not for green workmen that these "Dont's" are necessary, but for protection against the "wise" workman who always feels that he wants to go his fellow-workman one better. The green workman will always refrain from touching anything which he fears and does not understand, whereas his "wise" companion is probably thinking of how he can best show off his newly acquired ability before the new workman. Many furnace men jeopardize themselves daily by the use of such tactics, to say nothing of an untold amount of trouble they cause their employers. When these rowdy methods are dispensed with and furnace men do their work the safer way, then and then only will they find that their jobs are safe for themselves as well as their fellow-workman.

New Type of French Electric Furnace*

Closed Crucible with Special Features—Girod, Keller and Other Types Compared

THE furnace described in this paper, the idea of which is due to T. Levoz, a French metallurgist, presents certain interesting features, and illustrates one of the latest French developments. The use made of it during the war for the production of high-speed steel demonstrated the principles on which it is constructed.

The refining of a steel bath is effected by the action of the slag, of a fixed composition, on the molten metal. This action is made up of several reactions which require for their realization certain conditions already laid down by Prof. Campbell in the course of a meeting of the (British) Iron and Steel Institute, when the first practical trials of electric furnaces were being made. He laid stress upon the following important points, the realization of which appeared to him essential:

> The furnace should be closed as much as possible and should be of the simplest possible construction; the furnace should be entirely separated from the electrical fittings of the generators and transformers, which should be maintained at their highest capacity in order to increase the power of the installation; the wear of the refractory materials of the linings should be saved by applying the heat at the center of the bath, and those of the roof by protecting them from the direct radiation of the arc by the electrodes themselves; the slag should be given as large an area as possible, so as to increase the refining surface; and the temperature of the slag should be maintained above that of the steel, so as to secure fluidity and facilitate the high basicity required by an intensive refining process.

Professor Campbell also advised the use of a homogeneous and solid hearth, and with this in view, recommended that electrodes should not be allowed to pass through it. On the other hand, Dr. W. Borchers, who was one of the pioneers of electro-metallurgy, has spoken of the satisfactory results obtained by this latter type of furnace. The principle of this, the Girod furnace, was based on a combination of the resistance arc furnace. The metal to be melted constituted one of the electrodes, the slag covering it forming an electrolytic conductor, the metal constituting the resistance and the current being distributed by one or several carbon electrodes traversing the roof and by multiple contacts passing through the bottom. There was no question of the solidity of this furnace. The advantages arising from a uniform distribution of the current, effected by the arrangement of the contacts passing through the bottom, constituted one of its essential characteristics, namely that of insuring the efficacy of the furnace's refining action.

The section and length of these contacts were such that no one of them could carry more than a certain fraction of the total current without becoming overheated and, consequently, without its resistance being excessively increased. The regulation of the temperature and resistance of each contact was effected by cooling the hollow extremities by a water circulation system. Certain inconveniences were thus remedied, and as a result of the uniform arrangement of the contacts round the prolonged axis of the carbon electrodes the advantage of a uniform rabbling of the bath was obtained. Professor Campbell's one objection thus disappeared; moreover, the results already obtained at that time demonstrated the furnace's merits.

Girod, Keller and Hewitt Types Compared

When regularly working, the lining, which was chiefly composed of burned dolomite, withstood at least 80 heats. The bottom of the furnace stood 120 to 160 heats without repair and had then lost 100 mm. in thickness. With charges of molten metal the lining could stand 200 operations, and the roof about 20 to 35. The wear of the other parts of the furnace was comparatively slight and the consumption of carbon electrodes was from 12 to 15 kg. (27 to 33 lb.) per ton of steel.

The principle adopted in the Girod-type furnace, which was also to be adopted in the Keller-type furnace with a better distribution of current, thus marked an advance in the construction of electric furnaces. In the Keller-type furnace the distribution of the current in the bath, instead of being merely carried round a certain number of contacts, was effected over the whole depth of the bath by means of a bundle of iron bars surrounded by refractory clay which formed the furnace bottom. The current was introduced by a large carbon electrode rectangular in section.

As in the Girod-type furnace, the intensity of current necessary was high, as it had to reach 3000 amp.; but this high intensity had fewer disadvantages as the current was better distributed and the electric resistance in the large single electrode and in the conducting hearth was not as great. The difficulty of water cooling and of overheating of the carbon electrodes was avoided. The principles laid down by Professor Campbell therefore were observed in this furnace, notwithstanding the fact that the conductors passed through the hearth.

On the other hand, it might be objected that they were not followed in the first furnaces of the Heroult type, in which the better basic action was counteracted by the imperfect closing of the furnace, which was

*Abstract of a paper, contributed through the courtesy of the Association Technic de Fonderie de France, by R. Sylvany and presented at the convention of the American Foundrymen's Association at Rochester, N. Y., in June.

opened by three lateral doors and had the two electrodes passing through it from the roof. Nevertheless the effectiveness of the furnace was not as great as it might have been, although the rectangular surface of the bath was extended, because of the action of the arc being concentrated only in the vicinity of the electrodes. The intensity of the current alone was greatly reduced. The rectangular section, therefore, was unsuitable and at Remscheid it was reduced only to the zone of action of the arcs. The circular form introduced by Nathusius seems to be preferred, and it was this form of section which Heroult adopted for the 15-ton furnace which he built in the United States.

Details of the New Type

All these considerations led the inventor, previously mentioned, to produce a special type of electrical furnace, in which the principles already indicated were further developed and the various defects were minimized. He sought on the one hand, to secure rapidity of fusion and on the other to insure good purification by making the current pass as directly as possible—but at the same time with uniformity of distribution—through the metallic mass and the slag, the furnace being simple in construction, strong and well closed, without an excessive intensity of current being necessary.

For this purpose he constructed a closed crucible with only one opening for charging the material and the additions and for pouring the finished metal. He also placed the large carbon electrode in a sheath to obviate air currents in the space left free between the electrode and the roof. Thus he facilitated a better basic action.

Moreover, certain trials made for the first time at the electric power station of the commune at Jambes in Belgium enabled him to discover the possibility of placing electrodes in the lateral linings of the crucible without their being affected by wear at that level. In fact, as the lateral linings of the furnace presented a larger surface than that of the hearth (bottom), the number of iron conductor bars embedded in the linings can be increased so that their section can be lessened.

Thus a strong magnesite bottom can be composed which resists the action of the overheated metal much better than an armored hearth. Wires of 6 to 10 mm. (No. 9 to No. 3, B.W.G.) were found sufficient to obtain currents of 1200 to 1500 amp, at 85 vlots capable of developing the temperatures necessary to purify the entire mass, notwithstanding the depth of the bath.

The electric resistance of the conductor electrodes thus constituted is almost negligible, for, as has already been pointed out, the surface of the linings permits bringing into play a considerable number of wires equivalent to such a large conductance section that, without taking account of the conductivity of the bottom, the loss is already practically nil.

The use of small section metal conductors tends to produce a more uniform circulation of the electric current than the use of large section conductors, and the large surface of the positive carbon electrode is well utilized owing to the excessive splitting up of the current at the surface of the bath. The slag is highly and uniformly heated throughout its surface, and its temperature may be raised to the point required to secure good fluidity and intense chemical action.

Two Rows of Electrodes

To facilitate the process of refining still further the inventor was led to adopt a special device which consists in introducing two rows of superimposed lateral electrodes, the lower ones being termed fusion electrodes and the upper ones refining electrodes.

The fusion electrodes, which vary in number with the capacity of the furnace, are formed by a bundle of pure iron wires imbedded at the base in a mixture of magnesia and tar and united at the top so as to give a good contact with the metal contained in the crosswise channels arranged in the furnace hearth.

These electrodes are joined in series by a copper bar, which is itself connected by cables to the negative pole of the current transformer. The refining electrodes, which are placed on a level above that of the others, facing the slag, are also variable in number according to the capacity of the furnace.

A special device enables the current to be taken from the fusion electrodes and afterwards from the refining electrodes, or alternatively from both rows of electrodes at once. The number of wires forming the electrodes, as also the section of these wires, varies with the capacity of the furnace. The wires of the fusion electrodes have always a larger section than those of the refining electrodes.

In every case the current enters by a large vertical carbon electrode passing through the furnace roof, its horizontal section being half that of the furnace crucible. When direct current is employed this large positive electrode is hollowed out and forms a heat reflector; moreover the oxygen of the bath is liberated and is carried to the positive pole instead of remaining in the bath and oxidizing it.

The furnace proper consists of a steel plate body with a non-conducting refractory lining and fitted with a cover. Hollow trunnions, through which the conductor cables pass, enable the whole apparatus to be tilted. The current always passes through a layer of relatively thin metal, which enables currents of much lower intensity to be used. An intensity of 1500 amp. is not exceeded; nevertheless the temperatures obtained are diffused throughout the entire mass of the slag and metal.

This furnace was employed during the war in the production of high-speed steel. It was installed at the Jarville works of the Eclairage Electrique Co., near Nancy, now amalgamated with the Thomson-Houston Co. The results obtained appear to indicate that, with continuous working and by treating 1000 kg. (2205 lb.) per heat with an amperage of 3000 at 80 volts it would be possible with one furnace to obtain an output of eight tons per day by deoxidizing the metal obtained from a converter.

Bounty-fed versus British Steel

A new handicap with which British steel makers are faced is the proposal of the Union of South Africa to grant a bounty for iron and steel produced within the Union. The bounties, according to the *Engineer*, London, will extend over eight years and, beginning at 15s. per ton, will be graded downward, until in the last year they will be only 2s. 6d. per ton. Only works with a minimum capacity of 50,000 tons per annum will be entitled to receive the bounty. Such a policy cannot fail greatly to stimulate the production of iron and steel within the Union and, added to the present handicap of the import duty, may prove a disastrous blow to those British manufacturers who have hitherto looked to South Africa as a market. On the other side, the passing of the "prohibitive" tariff bill by the United States will probably keep out British special steels, while foreign markets nearer home are for all practical purposes closed by the operation of the money exchange. The outlook for British steel is, therefore, anything but bright, and it is not surprising to find the spirit of pessimism rapidly spreading in Sheffield.

Large Output of Portland Cement

Figures of the United States Geological Survey show that the August production of Portland cement, 11,664,000 bbl., was the greatest of any month of the year to date and was more than 10 per cent greater than the largest month of 1921. The total production for eight months this year has aggregated 70,139,000 bbl., as compared with a total of 62,280,000 bbl. for the first eight months of 1921. Present indications are that 1922 will establish a new high record in the production of Portland cement, for 1921 was only slightly less than 1920, the high record year.

Shipments, similarly, were made higher in August than in any preceding month of the year and far higher than in any month of 1921. The figure for August was 14,361,000 bbl. and for the eight months was 76,240,000 bbl., thus reducing stocks by more than 6,000,000 bbl. Stocks reported at the end of August aggregated 5,737,000 bbl.

Metal Schedule of Fordney-McCumber Tariff

(*Continued from page* 731)

[2½c. per lb.], lead dross [1½c. per lb.], reclaimed lead, scrap lead, antimonial lead, antimonial scrap lead, type metal, Babbitt metal, solder, all alloys or combinations of lead not specially provided for, 2½c. per lb. on the lead contained therein [2½c per lb.]; lead in sheets, pipe, shot, glazier's lead, and lead wire, 2⅜c. per lb. (25 per cent) [2⅜c. per lb.]

394. Zinc-bearing ore of all kinds, containing less than 10 per cent of zinc, shall be admitted free of duty; containing 10 per cent or more of zinc and less than 20 per cent, ½ of 1 per cent per lb. on the zinc contained therein; containing 20 per cent or more of zinc and less than 25 per cent, 1c. per lb. on the zinc contained therein; containing 25 per cent of zinc, or more, 1½c. per lb. on the zinc contained therein. [Here follows the administrative provision—Editor]

395. Zinc in blocks, pigs, or slabs, and zinc dust, 1¾c. per lb. [1⅜c. per lb.]; in sheets, 2c. per lb. [1⅝c. per lb.]; in sheets coated or plated with nickel or other metal (except gold, silver, or platinum), or solutions, 2¼c. per lb. [1¾c. per lb.]; old and worn-out, fit only to be remanufactured, 1½c. per lb. (15 per cent) [1c. per lb.]

396. Print rollers and print blocks used in printing, stamping, or cutting designs for wall or crêpe paper, linoleum, oilcloth, or other material, not specially provided for, composed wholly or in chief value of iron, steel, copper, brass, or any other metal, 60 per cent ad valorem. (20 per cent) [45 per cent]

397. Cylindrical steel rolls ground and polished, valued at 25c. per lb. or over, 25 per cent ad valorem.

398. Twist drills, reamers, milling cutters, taps, dies, and metal-cutting tools of all descriptions, not specially provided for, containing more than 6/10 of 1 per cent of tungsten or molybdenum, 60 per cent ad valorem.

399. Articles or wares not specially provided for, if composed wholly or in chief value of platinum, gold or silver, and articles or wares plated with platinum, gold, or silver, or colored with gold lacquer, whether partly or wholly manufactured, 60 per cent ad valorem; if composed wholly or in chief value of iron, steel, lead, copper, brass, nickel, pewter, zinc, aluminum, or other metal, but not plated with platinum, gold, or silver, or colored with gold lacquer, whether partly or wholly manufactured, 40 per cent ad valorem.

400. No allowance or reduction of duties for partial loss or damage in consequence of rust or of discoloration shall be made upon any description of iron or steel, or upon any article wholly or partly manufactured of iron or steel, or upon any manufacture of iron or steel.

Free List

Agricultural implements: Plows, tooth or disk harrows, headers, harvesters, reapers, agricultural drills and planters, mowers, horse-rakes, cultivators, thrashing machines, cotton gins, machinery for use in the manufacture of sugar, wagons and carts, cream separators valued at not more than $50 each, and all other agricultural implements of any kind or description, not specially provided for, whether in whole or in parts, including repair parts: Provided, That no article specified by name in Title I shall be free of duty under this paragraph.

1508. Antimony ore.

1514. Articles the growth, produce, or manufacture of the United States, when returned after having been exported, without having been advanced in value or improved in condition by any process of manufacture or other means if imported by or for the account of the person who exported them from the United States; steel boxes, casks, barrels, carboys, bags, and other containers or coverings of American manufacture exported filled with American products, or exported empty and returned filled with foreign products, including shooks and staves when returned as barrels or boxes; also quicksilver flasks or bottles, iron or steel drums of either domestic or foreign manufacture, used for the shipment of acids, or other chemicals, which shall have been actually exported from the United States; but proof of the identity of such articles shall be made, under general regulations to be prescribed by the Secretary of the Treasury, but the exemption of bags from duty shall apply only to such domestic bags as may be imported by the exporter thereof, and if any such articles are subject to internal-revenue tax at the time of exportation, such tax shall be proved to have been paid before exportation and not refunded; photographic dry plates and films of American manufacture (except moving-picture films), exposed abroad, whether developed or not, and photographic films light struck or otherwise damaged, or worn out, so as to be unsuitable for any other purpose than the recovery of the constituent materials, provided the basic films are of American manufacture, but proof of the identity of such articles shall be made under general regulations to be prescribed by the Secretary of the Treasury; articles exported from the United States for repairs may be returned upon payment of a duty upon the value of the repairs at the rate at which the article itself would be subject if imported, under conditions and regulations to be prescribed by the Secretary of the Treasury: Provided, That this paragraph shall not apply to any article upon which an allowance of drawback has been made, the reimportation of which is hereby prohibited except upon payment of duties equal to the drawbacks allowed; or to any article manufactured in bonded warehouses and exported under any provision of laws.

1519. Bells, broken, and bell metal, broken and fit only to be remanufactured. (Free list)

1533. Brass, old brass, clippings from brass or Dutch metal, all the foregoing, fit only for remanufacture. (Free list)

1542. Linotype and all typesetting machines, typewriters, [30 per cent] shoe machinery, [45 per cent] sand-blast machines, sludge machines, and tar and oil spreading machines [all 45 per cent] used in the construction and maintenance of roads and in improving them by the use of road preservatives; all the foregoing whether in whole or in parts, including repair parts. (All on free list)

1547. Chromite or chrome ore. (Free list)

1548. Coal, anthracite, bituminous, [45c. per ton] culm, slack, and shale; coke [20 per cent]; compositions used for fuel in which coal or coal dust is the component material of chief value, whether in briquets or other form [20 per cent] (All above on free list): Provided, That if any country, dependency, province, or other subdivision of government imposes a duty on any article specified in this paragraph, when imported from the United States, an equal duty shall be imposed upon such article coming into the United States from such country, dependency, province, or other subdivision of government.

1550. Cobalt and cobalt ore.

1555. Composition metal of which copper is the component material of chief value, not specially provided for.

1556. Copper ore; regulus of, and black or coarse copper, and cement copper; old copper, fit only for remanufacture, copper scale, clippings from new copper, and copper in plates, bars, ingots, or pigs, not manufactured or specially provided for.

1557. Copper sulphate or blue vitriol; copper acetate and subacetate or verdigris.

1562. Metallic mineral substances in a crude state, and metals unwrought, whether capable of being wrought or not, not specially provided for.

1570. Emery ore and corundum ore, and crude artificial abrasives.

1596. Iridium, osmium, palladium, rhodium, and ruthenium and native combinations thereof with one another or with platinum.

1597. Iron ore, including manganiferous iron ore, and the dross or residuum from burnt pyrites.

1619. Minerals, crude, or not advanced in value or condition by refining or grinding, or by other process of manufacture, not specially provided for.

1623. Needles, hand sewing or darning.

1634. Ores of gold, silver, or nickel; nickel matte; ores of the platinum metals; sweepings of gold and silver.

1644. Platinum, unmanufactured or in ingots, bars, sheets, or plates not less than ⅛ in. in thickness, sponge, or scrap.

1661. Shotgun barrels, in single tubes, forged, rough bored.

1684. Tin ore or cassiterite, and black oxide of tin: Provided, That there shall be imposed and paid upon cassiterite, or black oxide of tin, a duty of 4c. per lb., and upon bar, block, pig tin and grain or granulated, a duty of 6c. per lb., when it is made to appear to the satisfaction of the President of the United States that the mines of the United States are producing 1500 tons of cassiterite and bar, block, and pig tin per year. The President shall make known this fact by proclamation, and thereafter said duties shall go into effect.

1685. Tin in bars, blocks or pigs, and grain or granulated and scrap tin, including scrap tin plate. (Free list) [Free list]

1697. All barbed wire, whether plain or galvanized.

Items from Other Schedules

A number of products and materials in which the iron and steel trades are interested appear elsewhere than in the Metal schedule of the new tariff bill. Some of these are given below.

207. Bauxite, crude, not refined or otherwise advanced in condition in any manner, $1 per ton. (Free)

Fluorspar, $5.60 per ton. (Free)

201. Bath brick, chrome brick, and fire brick, not specially provided for, 25 per cent ad valorem; magnesite brick, ¾ of 1c. per lb. and 10 per cent ad valorem.

1536. Brick, not specially provided for: Provided, That if any country, dependency, province, or other subdivision of government imposes a duty on such brick imported from the United States, an equal duty shall be imposed upon such brick coming into the United States from such country, dependency, province, or other subdivision of government.

Graphite or plumbago, crude or refined: Amorphous, 10 per cent ad valorem; crystalline lump, chip, or dust, 20 per cent ad valorem; crystalline flake, 1½c. per lb. As used in this paragraph, the term "crystalline flake" means graphite or plumbago which occurs disseminated as a relatively thin flake throughout its containing rock, decomposed or not, and which may be or has been separated therefrom by ordinary crushing, pulverizing, screening, or mechanical concentration process, such flake being made up of a number of parallel laminæ, which may be separated by mechanical means. (Free)

216. Carbons and electrodes, of whatever material composed, and wholly or partly manufactured, for producing electric arc light; electrodes, composed wholly or in part of carbon or graphite, and wholly or partly manufactured, for electric furnace or electrolytic purposes; brushes, of whatever material composed, and wholly or partly manufactured, for electric motors, generators, or other electrical machines or appliances; plates, rods, and other forms, of whatever material composed, wholly or partly manufactured, for manufacturing into the aforesaid brushes; and articles or wares composed wholly or in part of carbon or graphite, wholly or partly manufactured, not specially provided for, 45 per cent ad valorem.

236. Grindstones, finished or unfinished, $1.75 per ton.

204. Crude magnesite, 5/16 of 1c. per lb.; caustic calcined magnesite, ⅝ of 1c. per lb.; dead burned and grain magnesite, not suitable for manufacture into oxychloride cements, 23/40 of 1c. per lb.

Provisions for Elastic Tariff

A distinct departure in tariff making for the United States is provided, the administrative provisions calling for an elastic tariff. The President is authorized to increase or decrease the duties and to shift to the American valuation plan (the ad valorem duties in the bill are based on the foreign valuation plan) under certain conditions.

Subdivision (a) authorizes the President to increase or decrease duties and to change classifications whenever necessary to equalize the ascertained differences in costs of production. No duty, however, may be increased or decreased more than 50 per cent of the duties specified in the bill and no authority is given to transfer from the dutiable list to the free list, or vice versa; nor may any duty be changed from specific to ad valorem, or vice versa. The conferees specified that the differences in costs of production are to be ascertained in the United States and in the principal competing foreign country, and removed the limit as to how long this provision may remain in effect.

Subdivision (c) prescribes the factors which the President is to take into consideration in determining differences in costs of production and also provides that investigations to assist the President in ascertaining such differences are to be made by the United States Tariff Commission. The conferees eliminated the provision of the Senate that the Tariff Commission hearings shall be public and that the President shall make the findings, hearings and testimony in all proceedings public as soon as practicable after the issuance of a proclamation. The President is not authorized to increase rates beyond the specified maximum ad valorem rates fixed in any paragraph. A new section also makes unlawful unfair methods of competition and unfair acts in the importation of merchandise into the United States, which threaten the stability or existence of American industry. Investigations of cases arising under this section are to be made by the Tariff Commission and its findings are subject to review, on questions of law, by the United States Court of Custom Claims. The final findings of the Commission are then transmitted to the President and he is authorized, in case such unfair methods or acts are established to his satisfaction, to impose additional duties upon merchandise imported in violation of the act, and in extreme cases he is authorized to prohibit the offending person from importing any merchandise into the United States. Another provision gives the President discretionary powers to impose additional duties or prohibition upon imports from any country discriminating against the overseas commerce of the United States, and is more far reaching than the precedent established by the Payne-Aldrich act.

Provision also is made for the United States to offer equality of treatment to all nations and at the same time insisting that foreign nations grant to American external commerce equality of treatment. A new section enlarges the powers of the Tariff Commission regarding investigations as to costs of production in this country and abroad, and it is authorized to establish an office in New York for the purpose of conducting investigations, calling witnesses, etc.

RAIL PRICE ADVANCED

Steel Corporation Announces First Change Since October, 1921

The United States Steel Corporation has recommended to its subsidiary companies that on Oct. 1 the price of standard steel rails be increased from $40 to $43 a ton, according to the following announcement late Sept. 13 by Elbert H. Gary, chairman:

"Until Sept. 30, 1922, the price of standard rails will continue to be $40 a gross ton base, f.o.b. mills, for deliveries to be made in about equal monthly installments prior to June 30, 1923. Commencing Oct. 1, 1922, the price will be increased to $43 a gross ton base, f.o.b. mills, for same deliveries."

The new price for steel rails fixed by the Steel Corporation is the first change since October, 1921, when the quotation was cut to $40 a ton from $47, the price recommended by the Industrial Board at Washington shortly after the armistice. In making his announcement Oct. 22, 1921, Chairman Gary Said:

"We have decided to recommend that our subsidiary companies reduce the selling price of standard rails to $40 per ton base, f.o.b. our mills. The present costs of production do not justify this action, but it is hoped and expected that reduction in freight rates and otherwise, together with larger operations, will soon have a beneficiary effect upon our costs."

Prior to that announcement, there had been a differential of $2 between Bessemer and open-hearth rails, but since the announcement the price has been on the same basis. From May, 1901, until January, 1914, the price of Bessemer rails was $28. This advanced to $30 and remained at that figure until May 1, 1916. After most of the requirements of the year had been contracted for, the makers announced an advance of $5 per ton, which put open-hearth rails at $35 and Bessemer rails at $33. Another advance was made in November, 1916, to $38 for Bessemer and $40 for open-hearth. These were the contract prices in 1917, but in line with the advance in other products, rail sales in the second half of that year were made at higher prices, ranging up to $57. In the early part of 1918, the $57 price for open-hearth rails was the basis of considerable sales, though at no time during the existence of the conference arrangement between the steel industry and the price fixing committee of the War Industries Board was there a controlled price on rails. Some mills realized considerable higher prices than $57 in the late months of 1917 and on through 1918 on sales for both domestic use and export. In early 1918, one road paid $73 on a 2500-ton order. As high as $85 was realized on some export business. For the greater part of 1918, Washington named $57 as the selling basis on Army and Navy purchases for the war, but otherwise prices were a matter of negotiation between buyer and seller.

When the Industrial Board announcement of reduced prices on steel products was made on March 21, 1919, a price of $47 for open-hearth rails was included and this was the basis of Steel Corporation contracts for that year, though it was the fact also that the Corporation reinstated on its books in the first half of 1919 considerable rail business that had been taken at the lower prices of 1917.

Fire at East St. Louis, Ill., did $10,000 damage to the plant of Benjamin Baits, manufacturer of well-drilling equipment, and $2,000 damage to the plant of the Atlas Boiler & Sheet Metal Works. The cause of the fire was undetermined.

Machinery Markets and News of the Works

RAILROAD NEEDS INCREASING

Buying of Machine Tools from That Source More Promising

Lima Locomotive Co. Buys $200,000 Worth of Shop Equipment—Baldwin Works Inquires for 32 Tools

The most promising development in the machine-tool industry is the renewed demand for tools for the repair and building of rolling stock for the railroads. The settlement of the railroad strike on certain roads has released some pending business and considerable more is in sight. The inquiry of the Missouri, Kansas & Texas Railroad at St. Louis for 116 machine tools and allied equipment, on which bids closed Monday, was the most cheering indication in some time of a resumption of railroad buying, which had been checked by the strike.

To keep pace with the demand for railroad locomotives, the Lima Locomotive Co., Lima, Ohio, has placed orders at Cleveland for about $200,000 worth of new shop equipment and another Ohio company, which is planning to devote its plant to the repair of locomotives, is in the market for $250,000 worth of new tools. The Baldwin Locomotive Works, Philadelphia, has issued an inquiry for 32 machines, most of them of heavy duty type.

Plans of the railroads apparently are to utilize every possible means to restore their rolling stock to normal condition, and it was recently announced by one road that it would work its repair shops 24 hr. a day. The Boston & Maine Railroad has contracted for the use of a New England machine-tool plant until March 1, 1923, and will utilize it as a repair shop. The effect of this, however, may be to defer some machine tool purchases that may have been contemplated.

Considerable railroad business is still pending at Chicago. The Chicago, Burlington & Quincy has not yet taken action on its inquiries, while the Chicago, Rock Island & Pacific has bought only a few tools that were imperatively needed. The Long Island Railroad has bought four machines at New York.

The industrial situation is clouded somewhat by the closing down of the Ford plants, which will affect many other industries wholly or partly dependent upon that automobile manufacturing company for business.

The General Motors Corporation, which is planning the manufacture of an air-cooled automobile, has revived a list issued earlier in the year. About 11 tools will be bought. The National Cash Register Co., Dayton, Ohio, has inquired for a number of tools. The Indiana Quarries Co., Bedford, Ind., has bought cranes and several tools.

Several steel companies in the Pittsburgh district have placed orders for steel rolling equipment and cranes for plant additions.

The prices of machine tools continue to strengthen and there have been fresh advances on a number of lines.

New York

NEW YORK, Sept. 18.

ASIDE from the inquiry of the Baldwin Locomotive Works, Philadelphia, for 32 machines, listed in detail in the Philadelphia report, and new inquiries from the General Electric Co., Schenectady, N. Y., for engine lathes, turret lathes, drill presses and other tools, there is no marked activity in the Eastern machine tool market. The Long Island Railroad has bought four machines, an axle lathe, a side-head boring mill, a hub facing machine and a wheel press, and the United Fruit Co. has bought two machines for export to one of its shops. Otherwise there has been no important buying during the week, but prospects continue to be numerous and the trade is hopeful of a growing volume of buying. The machine-tool price structure is strengthening, with fresh advances on a few lines of tools.

The crane market continues quiet, particularly on sales of electric and hand power cranes. Sellers of locomotive cranes still report some competition from the second-hand market. Current inquiries are in most cases for cranes of fairly large capacity, but in one instance, that of the Pennsylvania Railroad, Philadelphia, the original capacities of the inquiry have been reduced. The original tender, which called for two 250-ton, two 60-ton, two 25-ton and six 15-ton electric cranes of various spans, has been revised to ten 15-ton, two 60-ton and two 25-ton electric cranes, the two 250-ton cranes being dropped.

Among recent purchases are:

Presbey-Leland Co., Inc., Brattleboro, Vt., a 20-ton and a 40-ton, 50 ft. span, overhead traveling crane from the Pawling & Harnischfeger Co.

United Lead Co., Perth Amboy, N. J., four 4-ton, 27-ft., 10-in. span, transfer cranes from the Shepard Electric Crane & Hoist Co.

Phoenix-Portland Cement Co., Philadelphia, Pa., two 80-ft. span, 3 cu. yd. bucket handling cranes for Birmingham, Ala., from the Champion Engineering Co.

Lancaster Steel Products Co., Lancaster, Pa., a 10-ton, 45-ft, span, 3-motor overhead traveling crane from the Northern Engineering Works.

O. J. Dean Co., Chicago, two 5-ton electric traveling hoists from the Northern Engineering Works.

United States Cast Iron Pipe & Foundry Co., a No. 84 Newton cupola crane from the Northern Engineering Works.

Wiardi-Hall Acid Co., Brooklyn, N. Y., recently in the market for a 5-ton, double I-beam hand power crane, has purchased a second-hand crane.

Standard Oil Co., New York, reported last week as purchasing a 20-ton hand power crane, bought from Maris Bros., Philadelphia.

Third Avenue Railway Co., New York, two 3-ton pillar cranes mounted on flat cars from the Chesapeake Iron Works.

Phoenix Utility Co., 71 Broadway, New York, a 60-ton, 1-motor, 24-ft. span, overhead traveling crane from the Niles-Bement-Pond Co. This company is still in the market for a 60-ton, 4-motor, 71-ft. span, overhead traveling crane.

The New York Edison Co., 130 East Fifteenth Street, New York, has commenced erection of a one-story power house, 25 x 100 ft., at Thirty-second Street and Madison Avenue, to cost close to $200,000, including machinery. William Whitehill, Buckly Newhall Building, Forty-first Street and Sixth Avenue, is architect.

A vocational department will be installed in the new high school to be erected at Saranac Lake, N. Y., for which a bond issue of $400,000 is being arranged. C. B. Cutler, care of the local Board of Education, is architect.

The Mexican Petroleum Co., Ltd., 120 Broadway, New York, will expend about $1,000,000 for buildings and equipment for two gasoline extraction plants at its properties in the Tampico district, Mexico, one to be located in the Cerro

Azul field and the other at Chapopote. Construction work is under way on a new oil refining plant at Tampico, estimated to cost $2,000,000, including machinery, pipe line, pumping plants, etc.

The Lindsay Light Co., 91 Chambers Street, New York, manufacturer of lighting equipment, gas burners, etc., is arranging for the removal of its plant from Chicago to Youngstown, Ohio. The capacity will be increased. The company is increasing its capital from $1,000,000 to $1,200,000.

Plans are in progress for reorganization of the Willys Corporation, 52 Vanderbilt Avenue, New York, manufacturer of automobiles, which has been in receivership, a large part of whose plant property recently has been sold. The new organization will take over the assets of the present company and will dispose of a note issue of $6,000,000, a portion of the proceeds to be used for the acquisition of necessary plants and equipment. John A. Willys, president Willys-Overland Corporation, Toledo, Ohio, is one of the heads of the company.

The Mutual Electric & Hardware Mfg. Co., 28 Verandah Place, Brooklyn, is planning for the installation of new equipment at its plant, including a number of presses.

Freight-handling machinery, cranes, conveying equipment and other mechanical apparatus will be installed at the proposed barge canal terminal to be constructed by the Department of Public Works, Albany, N. Y., on Staten Island. Charles L. Cadle is superintendent of public works, Albany.

The Aetna Auto Engineering Corporation, 258 West Sixty-ninth Street, New York, operating an automobile construction and repair works, has leased the building at 217-19 West Sixty-fourth Street, for a term of years, for plant enlargements. Additional equipment will be installed.

The Sinclair Pipe Line Co., 45 Nassau Street, New York, a subsidiary of the Sinclair Refining Co., has arranged for a bond issue of $25,000,000, the proceeds to be used in part for new construction, including the doubling of the present capacity of the steel trunk line from Texas, Oklahoma and Kansas to the Chicago district, and for extensions in the vicinity of Houston, Tex., and in the Wyoming fields, with new pumping plants, steel pipe, steel tank storages, etc. J. R. Manion is president.

The Braden Copper Co., 120 Broadway, New York, has preliminary plans under way for enlargements in its copper milling plant, to increase the capacity from 10,000 to 15,000 tons of ore per day. The work, including machinery, is estimated to cost about $1,500,000.

The Anderson Sheet Metal Co., Providence, R. I., has leased the one-story building at 185-87 Seventh Street, Brooklyn.

The Auto Safety Appliance Co., 1493 Broadway, New York, has leased space in the building at 549-51 West Fifty-second Street.

The William Bayley Co., 110 West Fortieth Street, New York, manufacturer of steel window frames and sash, with plant at Springfield, Ohio, has acquired about 8,000 sq. ft. at Seventh Street and Van Alst Avenue, Long Island City, as a site for a one-story building for an eastern factory branch.

The Shenandoah Steel & Iron Corporation, New York, has leased the four-story building, 40 x 100 ft., at 230-32 West Thirty-eighth Street. Improvements will be made in the building.

The Brunswick Laundry Co., 222 Tonnele Avenue, Jersey City, N. J., will erect a three-story power house, 32 x 38 ft., on a site adjoining its plant, and will use a portion for a machine repair shop.

The Mehl Machine Tool & Die Co., Roselle, N. J., manufacturer of machinery, jigs, dies, etc., will establish a branch engineering works at Cleveland.

A vocational department will be installed in the high school to be erected at Orange, N. J.

A vocational department will be installed in the new two-story high school to be constructed on Main Street, Dumont, N. J., estimated to cost about $275,000. Ernest Sibley, Palisade, N. J., is architect.

R. Miele, 622 Springfield Avenue, Newark, N. J., operating a forge and blacksmithing shop, is inquiring for an upright power trip hammer.

The Seagull Fishing Reel Co., operated by Schoenfeld & Gutter, Inc., Newark, N. J., manufacturer of metal fishing reels, has leased a floor in the building at 420 Ogden Street, for the establishment of a new plant.

The Commonwealth Water Co., 20 Northfield Road, West Orange, N. J., will make extensions in its pumping plant at Canoe Brook, including the installation of new pumping machinery, compressors and other equipment, estimated to cost about $125,000.

Frutchey & Waddell, Woodbury, N. J., local representatives for the Studebaker automobile, are taking bids for the remodeling and improving of a local one-story building, 30 x 150 ft., for a new service and repair works.

A one-story vocational shop will be installed in connection with the new addition to be built at the Hawkins Street school, Newark, N. J., estimated to cost about $235,000. Guilbert & Betelle, 546 Broad Street, are architects.

The Peters Chocolate Co., Fulton, N. Y., has awarded contract for boiler house, 40 x 80 ft., to Barto-Phillips Co., 52 Vanderbilt Avenue, New York. Estimated cost $50,000.

The Holbrook Co., automobile body manufacturer, has awarded contract for a manufacturing building 100 x 260 ft., boiler house 20 x 30 ft., service building 20 x 30 ft., and connecting passage 25 x 50 ft., to Barto-Phillips Co., 52 Vanderbilt Avenue, New York. Estimated cost $80,000. One 100 hp. boiler with 100 ft. radial brick stack and complete sprinkler system with 40,000 gal. steel gravity tank are included.

The Ritter Dental Mfg. Co., Inc., Rochester, N. Y., has been manufacturing dental equipment for several years and is now obtaining figures on equipment for adding a small brass and aluminum foundry to its present plant.

New England

BOSTON, Sept. 18.

A LARGER number of important machine tools was sold in this territory last week than during the previous week, but business was confined to a limited number of houses. The trade in general is fully as inactive as during the early part of the month. Among the sales of new equipment are: One 40-ton and one 20-ton P & H crane to a Vermont marble concern; one centering machine and one 1½-in. screw machine to a central Massachusetts conveyance builder; a reamer grinder to a Rhode Island concern; three automatic lathes to a Massachusetts textile machinery builder, and a multiple spindle drill to an East Boston concern. A 24-in. shaper constitutes one of the leading sales in the used machine tool market.

It is generally believed here that the ending of the railroad shopmen's strike with some of the railroads will have little influence on the New England carriers as possible machine tool prospects. The Boston & Maine Railroad and the New York, New Haven & Hartford Railroad apparently intend to ignore the union and to keep present shopmen on the payroll. Both roads have let out considerable work since the strike started. During the past week the Boston & Maine Railroad contracted with a New England machine tool builder for the use of its entire manufacturing equipment until March 1, next. With a sizable percentage of repair work farmed out on contract, and with shops well filled with new and more or less unexperienced shopmen, it is believed the purchase of new machine tools by these two roads will be deferred.

The demand for machine tool repair parts and for small tools is good, although spotty. Individual orders often run up well into four figures.

Contract has been let for the erection of a one-story, 40 x 90 ft., manufacturing unit on Columbus Avenue and Dimock Street, Roxbury, Boston, by the Albert Griffiths Saw Co., 30 Whittier Street, Roxbury.

Bids are in on a one-story manufacturing plant for the Thompson Electric Welding Co., 161 Pleasant Street, Lynn, Mass.

The Hamilton Mfg. Co., Lowell, Mass., has awarded a contract for the construction of a re-inforced concrete hydro-electric power plant.

The Crompton & Knowles Loom Works, Worcester, Mass., has sold its Star Foundry Co. property in that city to Edward D. Priest, Schenectady, N. Y. It has not been operated since the war. The property, consisting of a one-story and basement foundry, will be developed for manufacturing.

The Murray-Mack Co., a Pennsylvania concern, has secured a location for a plant to manufacture automobiles at Randolph, Mass., near the railroad and close to the Randolph Foundry Co. plant.

The Universal Winding Co., Cranston, R. I., manufacturer of textile machinery, has arranged for a bond issue of $2,000,000, a portion to be used for extensions and improvements.

The General Electric Co., Schenectady, N. Y., is planning

the erection of a four-story addition to its plant at West Lynn, Mass., 120 x 157 ft., to cost about $200,000.

The Star Foundry Co., Worcester, Mass., an interest of the Crompton & Knowles Loom Works, same city, has disposed of its plant to Edward D. Priest, Schenectady, N. Y., for about $20,000. The plant has been inactive for some time. The new owner will resume production soon.

The American Thermos Bottle Co., Laurel Hill Avenue, Norwich, Conn., has plans under consideration for the erection of a large plant addition.

The Springfield Gas Light Co., 23 State Street, Springfield, Mass., will commence at once erection of a new one-story steam power house, 51 x 58 ft. on Page Boulevard.

The Maine Power Co., Norway, Me., is planning for the installation of additional machinery at its local power plant, including waterwheel, generator and auxiliary electrical equipment.

Kenneth W. McNeil, president of the Karm Terminal Co., Bridgeport, Conn., is the purchaser of the local plant of the Morris Metal Products Co., securing the property at public sale for $220,500. It consists of a main two-story building, 190 x 375 ft., designed as a machine shop.

A vocational department will be installed in a new high school at Shrewsbury, Mass., estimated to cost about $150,000. J. William Beal, 62 Summer Street, Boston, is architect.

P. & F. Corbin, Inc., Orchard Street, New Britain, Conn., manufacturer of locks and hardware products, has awarded a contract to William H. Allen, 12 Hungerford Street, for the erection of a plant addition to cost about $25,000.

The M. S. Little Mfg. Co., New Park Avenue, Hartford, Conn., manufacturer of metal plumbing goods, recently reorganized with $400,000 capital, has had plans prepared for the erection of a one-story addition, 50 x 65 ft., to cost about $18,000, exclusive of equipment. The reorganizers, including M. S. Little and H. B. Carey, have also organized the Hartford Valve Mfg. Co., with capital of $50,000, to manufacture valves and kindred equipment.

Plans have been completed for the erection of a new one-story power house, 75 x 78 ft., at the School for Feeble Minded, Waverly, Mass. C. H. Tenney & Co., 201 Devonshire Street, Boston, are engineers.

The Hope Street Garage Co., Inc., Fourth Street, Providence, R. I., is planning the construction of a 100-car capacity garage and machine shop.

Buffalo

BUFFALO, Sept. 18.

The American Radiator Co., Buffalo, has acquired a tract of land at St. Paul, Minn., totaling about 15 acres, as a site for the erection of a new plant to cost about $1,000,000. Headquarters of the company is at 820 South Michigan Avenue, Chicago.

The Dunlop Rubber Co., Buffalo, manufacturer of automobile tires, is considering a bond issue of $10,000,000, a portion of the proceeds to be used for plant equipment and operations, extensions, etc.

The Marsh Valve Co., Fourth Street and Brigham Road, Dunkirk, N. Y., manufacturer of valves and kindred engineering specialties, is planning for the erection of a two-story plant addition, 25 x 35 ft.

The Electric Storage Battery Co., 184 Clinton Avenue South, Rochester, N. Y., manufacturer of storage batteries, plates, etc., has awarded contract to the William Steele & Son Co., Sixteenth and Arch Streets, Philadelphia, for the erection of a new plant on Plymouth Avenue, near Barton Street.

The Owen-Dyneto Electric Corporation, Syracuse, N. Y., recently organized, has taken over the plant and business of the Dyneto Electric Corporation, which has been in the hands of a receiver. Ray M. Owen, president of the new corporation, recently acquired the assets of the former company for $205,000. The plant will continue in the manufacture of electric starting and lighting equipment for automobile service, generators, etc. James D. Grant is vice-president and treasurer of the new organization.

The Air Sales Reduction Co., 342 Madison Avenue, New York, manufacturer of acetylene welding equipment, etc., has commissioned Francisco & Jacobus, 511 Fifth Avenue, architects, to prepare plans for a new plant at Buffalo, on site selected, estimated to cost about $50,000.

The North East Electric Co., 348 Whitney Street, Rochester, N. Y., manufacturer of electrical equipment, will erect a two-story addition to its plant, 50 x 90 ft., to cost $35,000.

The Erie Railroad Co., 50 Church Street, New York, has terminated its contract with the Hornell Repair & Construction Co., Hornell, N. Y., for the operation of its local car shops, as well as similar shops at Salamanca, N. Y., and Susquehanna and Bradford, Pa., effective Sept. 10. The Erie company will resume the direct management of the different plants and proposes to operate at full capacity as soon as men are available. The company is also arranging for the termination of the contract with other interests for the operation of the car and locomotive shops at Corning, Elmira and Binghamton, N. Y.

The Jamestown Novelty Mfg. Co., Gifford Avenue and Jones Street, Jamestown, N. Y., manufacturer of steel enameled bathroom fixtures and kindred products, is planning for installation of new equipment in a factory at River and Chandler Streets.

The International Casement Co., 84 Hopkins Street, Jamestown, N. Y., manufacturer of rolled steel and bronze window casements, etc., has awarded contract to the Warren Construction Co., Jamestown, for the erection of a one and one-half story plant addition, 120 x 150 ft., estimated to cost about $50,000.

The Skelton Shovel Co., Hamilton, Ont., is calling for bids through McPhie & Kelley, Hamilton, architects, for the erection of a one-story plant on East Lake Road, Dunkirk, N. Y., estimated to cost about $100,000, including equipment. The Chamber of Commerce, Dunkirk, is interested in the project. W. E. Skelton heads the company.

The Lisk Mfg. Co., Geneva, N. Y., has let contract to Curran-Mason Co., Inc., Rochester, N. Y., for construction of a factory building, 160 x 280 ft., for the manufacture of enamel ware, which with other improvements will involve a total expenditure of $1,000,000. C. C. Keehn is president of the Lisk Mfg. Co.

The Electric Storage Battery Co., Philadelphia, has obtained a permit for construction of a factory building and assembly plant at Rochester, N. Y., to cost about $60,000. It will be one story, 134 x 134 ft., and will be erected on Plymouth Avenue, near Barton Street.

Philadelphia

PHILADELPHIA, Sept. 19.

THE Baldwin Locomotive Works, Philadelphia, has issued an inquiry for more than 30 machine tools as follows:

Three 66-in. horizontal boring and drilling matools as follows:

Two No. 9 vertical milling machines.
Two No. 1 plain milling machines.
Two rod milling machines.
Two frame slotters.
One frame drilling machine.
Four frame planers.
Fourteen standard planers.
Two turret lathes.

The Edward G. Budd Mfg. Co., Twenty-fifth Street and Hunting Park Avenue, Philadelphia, manufacturer of steel automobile bodies, is completing plans for the erection of a large plant addition. The Ballinger Co., Twelfth and Chestnut Streets, is architect and engineer.

The new building to be erected by Alfred Box & Co., 813 North Front Street, Philadelphia, manufacturer of cranes, hoisting machinery, etc., at Janney and Ontario Streets, will consist of a main one-story structure, 110 x 300 ft., with extension, 15 x 140 ft. The larger space will be equipped as a machine erecting shop and the other as a pattern shop.

The Philadelphia Suburban Gas & Electric Co., Philadelphia, has arranged for a preferred stock issue of $400,000, the proceeds to be used in part for extensions and improvements. An additional issue of $600,000, to make up a fund of $1,000,000 will be disposed of later.

The General Electric Co., Witherspoon Building, Philadelphia has completed plans for the erection of an addition to its local branch plant at Seventh and Willow Streets.

The Logan Ice Mfg. Co., Tenth and Windrim Streets, Philadelphia, is taking bids on a general contract for the erection of a new plant, consisting of four one-story buildings, with main structure, 96 x 182 ft.

Power equipment, ovens, conveying machinery and other mechanical equipment will be installed in a three-story baking plant for the Great Atlantic & Pacific Tea Co., at Ridge and Sedgley Avenues, Philadelphia, estimated to cost about $80,000, for which a general contract has just been awarded to the Turner Construction Co., Aramingo Street. Headquarters of the company is at 150 Bay Street, Jersey City, N. J.

A vocational department will be installed in the new high

school to be erected at Gloucester Heights, by the Board of Education, Gloucester City, N. J.

The plant of the Empire Tire & Rubber Co., Trenton, N. J., has been acquired by Campbell, Heath & Co., 5 Nassau Street, New York, stock brokers, for $1,675,000. W. W. Pepper, at one time president of the rubber company, is treasurer of the purchasing concern. It is proposed to form a new company to take over the property, with C. Edward Murray, Jr., Trenton, as head, and resume operations at an early date.

The National Radiator Co., East State Street, Trenton, N. J., has filed plans for the erection of a new one-story addition, to cost about $17,000.

A two-story and basement vocational school, 70 x 70 ft., to cost about $70,000, will be constructed by the Falls Township and Overfield Township School Districts, Mill City, Pa.

H. M. Spencer, Dunmore, near Scranton, Pa., is having plans prepared for the erection of a nearby two-story automobile service and repair building, 40 x 300 ft., on Drinker Street, estimated to cost close to $100,000. A list of equipment for installation is being arranged.

The Lehigh Valley Welding Co., Slatington, Pa., has been organized by Arnold Stoor and Oscar Roth, to operate a local machine shop and welding works.

The International Chain & Mfg. Co., York, Pa., has acquired the local plant of the Victoria Chain Co., manufacturing a kindred line of mechanical chains, and will take immediate possession. Plans are under way for the erection of additional buildings. George J. Campbell is president, and J. L. Mueller vice-president, in charge of production.

The Reading Transit & Light Co., Reading, Pa., is arranging facilities at its local shops for the construction of special cars for its local traction lines, including steel framework, bodies, fittings, etc.

The Stiffel & Freeman Co., Lititz, Pa., manufacturer of locks, safes, vaults, etc., is planning for the erection of a one-story addition, 140 x 175 ft.

The Blair Ice & Cold Storage Co., 3124 Fifth Avenue, Altoona, Pa., is preparing a list of equipment for installation at its new ice-manufacturing and cold storage plant, soon to be constructed. F. H. Sietz is president.

A vocational department will be installed in the new two-story and basement high school at Clarks Summit, Pa., estimated to cost about $100,000, for which bids on a general contract are being asked until Sept. 25.

A vocational department will be installed in the proposed new high school to be erected at Annville, Pa., estimated to cost in excess of $100,000.

Pittsburgh

PITTSBURGH, Sept. 18.

DEMAND for machine tools in this territory still runs largely for individual tools, with few lists coming before the trade. The Pittsburgh Board of Education on Sept. 12 took bids on 15 metal working tools and for a number of woodworking machines, but awards have not yet been announced. A maker of lathes is reported to have announced an increase in prices of 12½ per cent, effective Oct. 1, and there also has been a revision upward in prices of Bridgeport grinders. Heavy equipment has shown much activity. The Mackintosh-Hemphill Co., which recently was awarded a 40-in. blooming mill for the Otis Steel Co., Cleveland, in the past week received the award of the sheet bar and sheet mills for that plant. A new strip mill for this company has been placed with the United Engineering & Foundry Co., Pittsburgh.

In addition to the cranes recently placed by the Otis Steel Co. with the Alliance Machine Co., Alliance, Ohio, the company last week placed with the Morgan Engineering Co., Alliance, Ohio, an order for five cranes, one 25-ton with 10-ton auxiliary, 85 ft. span, one 40-ton with 10-ton auxiliary, 85 ft. span, one 10-ton, 25 ft. span, one 10-ton, 75 ft. span and one 10-ton, 105 ft. span.

The Morgan company also has taken a 25-ton crane with 10 ton auxiliary, 68 ft. span for the Republic Iron & Steel Co., Youngstown, Ohio.

The Weirton Steel Co., Weirton, W. Va., has ordered five Shaw cranes for its new sheet mill, one 10-ton, 70 ft. span, to serve the galvanizing and pickling departments, one 10-ton, 70 ft. span, to serve the warehouse, one 15-ton, 55 ft. span for the bar yard, one 30-ton, 75 ft. span for the hot mill department and one 40-ton, with 10-ton auxiliary, 70 ft. span to serve the annealing furnaces.

The Babcock & Wilcox Co. has purchased a 50-ton Shaw trolley for its Barberton, Ohio, plant.

The Center Foundry & Machine Co., Wheeling, W. Va., which is building a new plant at Warwood, W. Va., has bought a 10-ton, 3-motor, 45½ ft. span crane from the Northern Engineering Works, Detroit, and a 66-in. and an 84-in. cupola from the same company.

George R. Fink, who resigned recently as sales manager, West Penn Steel Co., is interested in a new company which will build a sheet plant in Detroit.

The American Window Glass Co., Farmers' Bank Building, Pittsburgh, will take bids at once for the erection of the proposed addition to its plant at Jeannette, Pa., consisting of a main one-story, 12-machine building, estimated to cost close to $1,500,000. B. J. Pierce, company address, is engineer. W. L. Munro is president.

The International Motor Truck Corporation, 25 Broadway, New York, has leased the one-story building, 137 x 185 ft., now in course of construction at Liberty Avenue and Gross Street, Pittsburgh, for a service and repair works. A special shop for mechanical work will be arranged.

Bids for insulated wire, soft steel wire, tinned iron wire, annealed iron wire, annealed copper wire, wire nails, wire rope, boiler tubes, covering quantities for three months' requirements, will be received by the Pittsburgh & Lake Erie Railroad Co., Pittsburgh, until Sept. 26. C. M. Yohe is purchasing agent.

A vocational department will be installed in the two-story and basement high school to be constructed at Vandergrift, Pa., estimated to cost about $155,000, for which bids on revised plans are being received until Sept. 30.

The Armstrong Cork Co., Twenty-fourth Street, Pittsburgh, manufacturer of insulation products, is arranging for a stock issue of $13,000,000, a portion of the proceeds to be used for extensions and improvements, and additions in working capital.

A one-story automobile service and repair works, for company cars and trucks, will be constructed by the Fairmont Creamery Co., 301 Ferry Street, Pittsburgh.

The Raleigh Motor Co., Beckley, W. Va., has plans nearing completion for the construction of a new three-story service and repair building, 50 x 146 ft., estimated to cost about $65,000.

A vocational department will be installed in the new three-story and basement high school, 225 x 240 ft., to be erected at State and Case Streets, Sharon, Pa., for which bids on a general contract are being received until Sept. 29.

The Fleischmann Co., 508 West North Street, Pittsburgh, manufacturer of yeast, has had plans prepared for a new one-story automobile service and repair building at Western and Allegheny Avenues.

Chicago

CHICAGO, Sept. 18.

PRICE advances continue to feature the machine tool market. The Brown & Sharpe Mfg. Co. has marked up its line about 10 per cent and a Milwaukee manufacturer of milling machines has likewise announced advances averaging 10 per cent.

Considerable railroad buying is still pending. The Chicago, Burlington & Quincy has not yet taken action on its inquiries, while the Chicago, Rock Island & Pacific has placed a few tools and will buy others against its old list. The latter road has picked out of this list equipment that is imperatively needed and does not intend to buy the balance of the tools at this time. Business from industrial companies is scattered and rarely covers more than one or two machines per purchase. Some of these orders, however, call for large machines and therefore run into considerable money. One dealer, for example, has booked orders for a 36-in. x 36 in. x 12-ft. planer and a 3/16-in. x 8-ft. gate shear.

The Western Steel Car & Foundry Co., Hegewisch, Ind., has placed a 10-ton 88-ft. span electric overhead traveling crane with the Whiting Corporation. The Whiting company has also booked an order for a 120-in. cupola from the Pullman Co. for the latter's new carwheel foundry at Pullman, Ill.

The Electro-Magnetic Tool Co., Nineteenth Street and

Fifty-second Avenue, Cicero, Ill., has purchased the north portion of the G. S. Blakeslee Co. plant in Fifty-second Avenue, near Nineteenth Street, comprising 90,000 sq. ft. of land with buildings containing 15,000 sq. ft. The purchaser will erect an additional building.

The Bates Valve Bag Co., 7310 South Chicago Avenue, Chicago, has let contract for the construction of a two-story factory, 100 x 120 ft., 8232-40 South Chicago Avenue, to cost $60,000.

The Enterprise Parlor Furniture Co., 2315 West Huron Street, Chicago, has let contract for a third story addition, 100 x 125 ft., to cost $50,000.

The Florence Art Co., manufacturer of composition lamp standards, book ends and candle sticks, 671 West Ohio Street, Chicago, has let contract for a four-story factory, 50 x 108 ft., North California and Stave Streets, to cost $125,000.

The American Casket & Mfg. Co., 1317 West Division Street, Chicago, has let contract for a three-story factory addition, 25 x 70 ft., to cost $30,000.

Arthur Leher and Angelo Varna have formed a partnership and have opened the Herrin Sheet Iron Metal Works at 109 Madison Street, Herrin, Ill.

The Automotive Gear Works, a new company, will construct a one-story plant with 30,000 sq. ft. of floor space at Richmond, Ind.

The Central Illinois Public Service Co., Mattoon, Ill., will soon call for bids for the erection of a new power plant on the Mississippi River, near Grand Tower, Ill., estimated to cost about $2,000,000, including machinery. Sargent & Lundy, 72 West Adams Street, Chicago, are engineers.

The Eaton Metal Products Co., 3254 Walnut Street, Denver, Col., is planning for the installation of new equipment at its plant, including a number of presses for stamping and bending metal goods.

The Nebraska Power Co., Omaha, Neb., has arranged for a bond issue of $3,500,000, a portion of the proceeds to be used for extensions and improvements. A. S. Grenier is vice-president.

The City Council, Marshall, Ill., will receive bids until Oct. 5 for the construction of a new municipal power plant, with ice-making and refrigerating plant extension, to include two generators, Corliss engines, two water tube boilers, feedwater heater, feed pumps, piping, etc.; also ice-manufacturing machinery for an initial capacity of 15 tons a day. F. L. Wilcox, Chemical Building, St. Louis, is engineer.

J. J. Stone, International Falls, Minn., has plans prepared for the erection of a new one-story and basement automobile service and repair works, 75 x 85 ft., with machine shop. Bids will soon be asked. William P. Allard, Ferguson Building, Duluth, Minn., is architect.

A new one-story power house, 79 x 89 ft., will be constructed at the State Illinois Soldiers' and Orphans' Home, Normal, Ill. Bids for the plant are being received until Sept. 26 by C. R. Miller, chairman of Public Works and Buildings, Springfield, Ill. Edgar A. Martin, 410 South Wabash Avenue, Chicago, is architect.

The Chicago, Burlington & Quincy Railroad Co., 547 West Jackson Boulevard, Chicago, is completing detailed plans for the erection of its proposed new shops at Denver, Col., to be located on a 275-acre tract of land at Fifty-first Street, near Broadway, recently acquired. Six main buildings will be constructed, including machine shop, forge and blacksmith shop, boiler shop, oil house, power plant, and storehouse and office. The entire plant with machinery is estimated to cost in excess of $1,500,000. T. Krausch, engineer of buildings for the company, will be in charge of erection.

Detroit

DETROIT, Sept. 18.

INQUIRIES on machine tools have been very light since the first of the month but there have been no deliveries extended on orders already placed. Undoubtedly the fuel situation has had a depressing effect on new business. Representatives of machinery manufacturers are optimistic, however, and are anticipating a reflection of the improved industrial outlook early in October. The shut down of the Ford plants is apt to be seriously felt if long continued.

The Kalamazoo Blow Pipe Co., 408 North Church street, Kalamazoo, Mich., will soon take bids for the erection of a new one-story plant, 35 x 155 ft., on North Church Street, to cost about $50,000. E. S. Batterson, Hanselman Building, is architect. H. F. Brundage is president.

The Detroit Edison Co., Detroit, will build a new one-story power house at Mt. Clemens, Mich., to cost about $150,000, including equipment.

The Burr-Patterson Co., 4211 Woodward Avenue, Detroit, manufacturing jeweler, will commence the immediate erection of a new two-story plant, 40 x 105 ft., to cost close to $50,000, including precision tools and other equipment.

A vocational department will be installed in the three-story high school to be erected at Eaton Rapids, Mich., to cost about $125,000, for which bids on a general contract will be asked soon.

The Muzzy-Lyon Co., Detroit, manufacturer of engine bearings, babbitt alloys, etc., has removed its plant from 535 West Larned Street, to a new building on Shoemaker Street, near St. Jean Street. The structure will provide a total floor area of 36,000 sq. ft., which will be entirely utilized with present equipment from the former works and new machinery. J. H. Muzzy is president and general manager.

The Fisher-Ohio Body Corporation, General Motors Building, Detroit, manufacturer of automobile bodies, has awarded a contract to the Realty Construction Co., Flint, Mich., for the erection of a new two-story plant on Wilcox Street, Flint, 200 x 400 ft., to be equipped for assembling. Albert Kahn, 1000 Marquette Building, Detroit, is architect. Fred J. Fisher is president.

The Kessler Sales & Service Co., 4627 Dix Avenue, Detroit, is arranging for the installation of additional equipment at its service and repair works. A list of machinery will be prepared at an early date.

The Flint Steel Co., Flint, Mich., recently organized, has acquired the entire plant and business of the Perkins Structural Steel Co., which has been operating a local works for about a year past. The new company will take immediate possession. W. L. Perkins is president and general manager.

The Briggs Mfg. Co., Hamtramck, Mich., has plans under way for the erection of a new one-story power plant at its works, 80 x 83 ft. The company specializes in the manufacture of automobile bodies. M. L. Briggs is secretary.

The Department of Street Railways, Shoemaker Street, Detroit, is planning for the construction of a new one-story machine and mechanical repair shop on Woodward Avenue, estimated to cost about $100,000, including equipment. W. C. Markham, 312 Marquette Building, is engineer.

The Progressive Club, Montague, Mich, is arranging for the establishment of a new industry at the plant of the Montague Iron Works, which has been idle for about three years. The new company will remodel the works for the manufacture of piston rings and kindred automotive products, with the installation of new equipment.

The Bryant Paper Co., Kalamazoo, Mich., has announced an extensive building program including a new power plant and a machine shop.

The Monroe Auto Equipment Co., Monroe, Mich., is erecting a foundry, 64 x 100 ft., in connection with its present plant. This company manufactures automobile pumps and brake shoes and the new foundry will give it capacity for production work beyond its own needs. Officers of the company are C. S. McIntyre, president; W. S. Meyers, secretary and general manager.

The C. G. Spring Co., manufacturers of spring bumpers, has taken a five year lease on the building formerly occupied by the Detroit Stoker Co., West Grand Boulevard, east of Russell Street. The building contains approximately 17,000 sq. ft., which will be utilized for manufacturing purposes and as a service station.

The Ford Motor Co. will erect an experimental laboratory, one story, steel, 200 x 800 ft., at Dearborn, Mich. Albert Kahn is architect.

In connection with its entrance into Detroit, the Pennsylvania Railroad system has announced the awarding of contracts covering four building projects which will form the principal unit of the roads general operating plans for this territory and which before completed will involve an expenditure of approximately $20,000,000. The present construction includes an engine house at Ecourse, freight house, 70 x 680 ft., at Third and Larned Streets, to cost $200,000 and a turn table, water and coaling station at Third and Summit Streets.

The Cerruti Aircraft Corporation, capitalized at $100,000, has begun operations at 3834 Grand River Avenue, Detroit, manufacturing airplanes. Officers of the company are Lieut. Frank A. Cerruti, president, Floyd F. Williams, vice-president and L. V. Martin, secretary and treasurer.

The Wheel Trueing Co. is erecting a modern factory building at Oakland and Victor Avenues, Highland Park. Special equipment has been ordered for the manufacture of trueing wheels, diamond dies for wire drawing, shaped carbon tools for turning hard rubber, fiber and celluloid and diamond saw teeth for cutting stone and marble. Harvey B. Wallace is general manager.

Baltimore

BALTIMORE, Sept. 18.

The Baltimore Steel Co., Eastern Avenue and Eden Street, Baltimore, has purchased property adjoining its plant, totaling about 20,000 sq. ft., as a site for an addition. Plans are under way for the new building, estimated to cost $200,000, including equipment. The company specializes in the fabrication of structural steel, ornamental steel and iron products, etc.

The Security Cement Lime Co., Equitable Building, Baltimore, has arranged for a note issue of $300,000, the proceeds to be used in part for extensions to its cement manufacturing plant at Security, Md. The present works will be enlarged and additional machinery installed to increase the capacity from 950,000 barrels to 1,400,000 barrels a year. Loring A. Cover is president.

A three-story automobile service and repair building for company trucks and cars, with machine and mechanical repair works, and fire plant, 76 x 110 ft., to cost about $75,000, will be erected by the Corby Baking Co., 2301-7 Georgia Avenue, N. W., Washington, D. C., on site in the vicinity of the baking plant. Col. P. M. Anderson, 705 Southern Building, is consulting engineer.

The Consolidated Machine Tool Corporation, 17 East Forty-second Street, New York, has awarded a general contract to the Shoemaker-Satterthwait Bridge Co., 4 South Fifteenth Street, Philadelphia, for the erection of a new two-story foundry at its Hilles & Jones plant, Ninth and Church Streets, Wilmington, Del., 98 x 240 ft., steel and concrete.

The City Council, Elizabeth City, N. C., has tentative plans for the construction of a new municipal electric light and power plant, in connection with new waterworks and pumping plant, to cost about $750,000. About five acres has been acquired in the Knobb's Creek district for the plants.

The Purchasing Agent, Post Office Department, Washington, D. C., will receive bids until Sept. 22, for 72 dozen steel oilers.

The Allen Transfer & Repair Co., 1715 West Cary Street, Richmond, Va., is planning for the installation of new equipment at its machine works, including lathe and drill press.

The City Manager, P. C. Painter, Greensboro, N. C., will receive bids until Oct. 10, for equipment to be installed in connection with a new filter plant at the waterworks, including one 1,000-gallon per minute, motor-operated pumping unit; steel wash water tank, 70,000 gallons capacity; piping, valves, and other kindred miscellaneous equipment. J. L. Ludlow is consulting engineer.

The Snapp Foundry, Inc., Winchester, W. Va., recently organized with a capital of $50,000, will take over the local plant and business heretofore operated as the Snapp Foundry Co. The company will continue the operation of the plant for the manufacture of power ice saws, etc., and contemplates expansion in the near future. C. Arthur Robinson is secretary.

The Queen City Iron & Metal Co., Charlotte, N. C., has acquired the plant of E. I. du Pont de Nemours & Co., at Georgetown, S. C., heretofore devoted to the manufacture of industrial alcohol and kindred products, and will use it for plant extensions.

The Consolidated Gas, Electric Light & Power Co., Lexington Building, Baltimore, has arranged for a bond issue of $5,000,000, a portion to be used for extensions and improvements. Herbert A. Wagner is president.

The Standard Variometer Co., City Point, Va., recently organized, has arranged for the operation of a local plant for the manufacture of radio equipment and parts, and kindred electrical specialties. P. B. Woodward is president.

In connection with its proposed new electric generating plant at Williamsport, Md., the Potomac Public Service Co., Hagerstown, Md., will install an electrically-operated overhead traveling bridge crane, with capacity of about 40 tons. The station will have a generating capacity of about 15,000 horsepower, and other machinery to be installed includes mechanical stokers, economizers, marine type boilers, condensers, vaporizers,, electric generators, exciters, switchboards, pumping machinery, and auxiliary equipment. The entire plant will cost approximately $1,500,000. Sanderson & Porter, 52 William Street, New York, are engineers. The company is operated by the American Water Works & Electric Co., 50 Broad Street, New York.

A vocational department will be installed in the new high school to be erected at Crisp, N. C., by the Edgecombe County School Board, Speed, N. C. Plans have been prepared.

The City Council, Harrisonburg, Va., is planning for the immediate construction of its proposed new steam-operated electric power plant, estimated to cost about $80,000, for which plans have recently been completed. It will have an initial capacity of 500 kilowatts and which will be increased at a later date.

The Anderson Motor Co., Rock Hill, S. C., manufacturer of automobiles, has preliminary plans for an addition to its plant.

The Imperial Tobacco Co., Richmond, Va., is planning for improvements in the power house at its plant, to include the installation of oil-burning equipment to replace the present coal burning plant. Inquiries are being made as to different types of equipment.

Cleveland

CLEVELAND, Sept. 18.

AN Ohio company that will equip its plant for locomotive repair work will require approximately $250,000 worth of machinery and placed orders for a few tools during the week. One other important feature of the market is the purchase of 35 or more tools aggregating approximately $200,000 by the Lima Locomotive Co., for its plant extensions. Over half of this business went to the Niles Tool Works, the remainder being divided between three other distributors. The Niles Co. took 12 6 ft. Right Line radial drills, six Pond planers, five 60 in., one 90 in. and a 50 ft. triple head Bement locomotive frame slotting machine. Additional purchases reported included three planers, a vertical rod boring machine, a vertical rod milling machine, axle turning lathe, four 20 in. engine lathes, two tool makers' lathes, a 60 in. wheel press, cylinder boring machine, two 18 in. slotting machines, a horizontal boring and milling machine and two turret lathes.

Dealers are getting a fair volume of business in single tools. Turret lathe manufacturers report an improvement in a scattered demand for single tools.

More price advances are coming out, being made by manufacturers who had not previously marked up their prices to meet the increasing cost of manufacture. The Monarch Lathe Co., Sidney, Ohio, has advanced its line of lathes 10 per cent and an Ohio manufacturer of turret lathes has advanced its price approximately 10 per cent. A large Eastern machine-tool manufacturer withdrew outstanding quotations Saturday and will announce price advances this week.

The Sterling Stone & Lime Co., Delaware, Ohio, will erect a stone crushing plant with a capacity of 1200 tons per day. H. E. Culbertson is president and J. T. Herrick, vice-president and general manager.

The C. L. Dover Foundry Co., Bellaire, Ohio, has commenced the erection of a foundry addition 35 x 60 ft.

The Smokeless Oil Burner Co., Bucyrus, Ohio, has been incorporated with a capital stock of $25,000 and will manufacture oil burners for industrial purposes. The burner has been manufactured for two years under a partnership arrangement. C. W. Moore and P. H. Ryder are understood to be the principal owners of the company. They are associated with the Ryder Brass Foundry in Bucyrus.

The Barberton Machine & Foundry Co., recently incorporated with a capital stock of $10,000, has purchased the property and patents of the Keyless Lock Co., Akron, Ohio.

The American Shipbuilding Co. has placed a contract for a one story, 50 x 60 ft. factory building to be erected in connection with its Cleveland shipping yard.

The Towmotor Co., Cleveland, has just shipped two towmotors to New South Wales. Other recent purchases include two machines purchased by Ball Bros. Glass Mfg. Co., and one by the Carnegie Steel Co.

The L-M Axle Co., Cleveland, announced that it has completed negotiations for acquiring the plant of the Jones Gear Co., Wayside Road and the Nickel Plate Railroad, Cleveland. This is virtually a new plant. The main building is 100 x 200 ft. and there are other buildings including a heat treating department. It is reported that the buildings and machinery were sold for about $500,000. George B. Durell, treasurer of the American Fork & Hoe Co., is president of the L-M Axle Co., and J. S. Vaughan is secretary.

The plant of the New Process Gear Corporation, Syracuse, N. Y., which was a subsidiary of the Willys Corporation, has been sold to Thomas W. Warner, Toledo, Ohio, for $1,904,000. Mr. Warner has been prominently identified with

the automotive industry in the Central West and was formerly vice-president of the General Motors Corporation. He is at present vice-president of the Durant Motors, Inc., of Indiana.

The monthly report of the Ohio State Foundrymen's Association compiled from data supplied by about 50 members shows a considerable increase in operations during August. On Sept. 1 the plants reporting were melting at 70 per cent of capacity as compared with a 58 per cent melt Aug. 31.

Cincinnati

CINCINNATI, Sept. 18.

THE feature of the machinery market during the past week was the receipt of the Missouri, Kansas & Texas Railroad list, for shops at Bellmead, Tex., which calls for approximately $500,000 worth of equipment. The list includes complete equipment for a large shop, and as bids are to be in Sept. 18, it is expected that purchasing of tools will be begun in a short time.

The National Cash Register Co., Dayton, Ohio, has a list out for a number of tools on which action is expected this week. The General Motors Corporation, which is planning to turn out an air-cooled car, has revived a list of tools issued early in the year, and on which no action had been taken. It is expected that at least 11 miscellaneous machines will be purchased. The original inquiry called for 29, but some of these tools have been supplied by various units of the corporation. Inquiries for single machines show a fair improvement over the previous week, and with a settlement of the rail strike in sight, it is expected that the machinery market will be given a healthy stimulus, particularly as prices generally show strength. Recent announcements of stiffening prices have had the effect of bringing in quite a few orders, particularly for shapers. There have been no large orders placed.

The Indiana Quarries Co., Bedford, Ind., which will build a new plant to replace the one destroyed by fire some months ago, has placed orders for the equipment for its new buildings, which included a number of cranes, and miscellaneous machine tools. Agricultural implement manufacturers, who have been displaying their products at various fairs throughout the country, report very much interest being shown by farmers in their exhibits, and it is expected that buying will be good during this fall and next winter.

The Rahn-Larmon Co., Cincinnati, manufacturer of gap and engine lathes, has advanced its list price 12½ per cent effective Sept. 15.

The Ironton Boiler Works Co., Ironton, Ohio, has been incorporated with a capitalization of $50,000. The company has been operating as a partnership. Additions to plant and equipment, to take care of increasing business, are planned. P. F. Meehan heads the company.

The Cincinnati Valve Co., Cincinnati, has been incorporated with a capitalization of $10,000 and will manufacture a new type of steam valve. The plant will be located on Richmond Street. Thomas F. Bickett is general manager.

The Morton Last Co., Cincinnati, has been incorporated with a capitalization of $125,000, to manufacture shoe lasts. The plant will be located at Third and Eggleston Avenue. Charles P. Morton is president.

Contract will be awarded this week for the construction of the new plant of the J. A. Fay & Egan Co., Cincinnati, which will cost, with equipment, approximately $500,000. The plant will be located in the Bond Hill section of the city. The company is one of the largest manufacturers of woodworking machinery in the world, and when the new plant is in operation will greatly increase its capacity. Part of the equipment for the new plant has been contracted for. Clifford Egan is president.

Negotiations are being conducted for the purchase of the property of the Barney & Smith Car Co., Dayton, Ohio, now in receiver's hands, by a large Eastern car manufacturing company. It is understood that the company has made an offer close to $2,000,000 for the property, which is now being considered by the bondholders' protective committee. Should the deal go through it is planned to operate the plant at once, principally on car repair work.

Milwaukee

MILWAUKEE, Sept. 18.

ADMITTEDLY a great load has been removed from the minds of the men engaged in the machine-tool industry by the effect of the settlement of the railroad shop crafts strike, which likewise has eased the tenseness of the situation of general business. While the outcome had been discounted and at the outset opinion varied only with respect to the duration of the strike, it was probably of more moment to the tool trade than almost any other that such a contingency should arise. Unquestionably the calling of the shop strike caused railroad companies to postpone very heavy purchases of equipment sorely needed, and now that this trouble has been overcome, manufacturers as well as dealers expect to receive some sizable business affecting virtually every line of tools.

The Elwood Tractor Co., Madison, Wis., is moving works and offices to Paris, Ill., having taken over the entire business, plant and equipment of the Paris Mfg. & Engineering Co. For several years the Elwood company has maintained a small experimental and development shop in Madison, and it is now ready to engage in quantity production of tractors. An output of 1000 machines in 1923 has been laid out and purchases of materials as well as additional shop equipment are being made on this basis. H. A. Burd, general manager, and C. D. Elwood, chief engineer, continue in charge of the business under the physical merger with the Paris company.

The North Milwaukee Foundry Co., North Milwaukee, Wis., sustained an estimated loss of $35,000 in the destruction of its shop on Commerce Avenue by fire of undetermined origin on Sept. 15. No decision will be made concerning the erection of a new plant until the loss has been adjusted.

The Milwaukee Air Power Pump Co., 886-890 Third Street, Milwaukee, will build a new plant, 130 x 150 ft., one story, of brick and steel construction, on a new site on Keefe Avenue, west of Humboldt Avenue, at an estimated cost of $75,000. The Erich G. Schroeder Co., consulting engineer, 405 Broadway, local, is preparing plans and equipment specifications. Work is expected to start about Oct. 1. John R. Ball is president and treasurer.

The Wisconsin Regrinding Co., Sheboygan Falls, Wis., conducting a general machinery repair and automobile engine service shop, with a branch at Fond du Lac, Wis., will establish a second branch at Rhinelander, Wis. A new shop, about 30 x 75 ft., will be erected, and new equipment installed. Roy Nichols, vice-president, has been assigned to the Rhinelander branch as manager. William Findlay is president and A. P. Schneidewent, secretary and treasurer.

The C. C. C. Co., Oshkosh, Wis., manufacturer of patented folding beds, davenports, etc., has taken over the plant and business of the Juul-Peterson Mfg. Co., 83 High Street, local, which manufactures hardware specialties and metal parts and appliances for furniture, etc. It is the intention to erect a new factory and shop building during the winter and consolidate the operations, but for the present the C. C. C. Co. will continue to occupy its quarters at 29 Main Street, and the Juul-Peterson company its High Street shop, where it will continue to do a jobbing business in addition to supplying the needs of the parent concern.

The Board of Education, Drummond, Bayfield County, Wis., is taking bids until Oct. 3 for the construction of a new high, graded and vocational training school, 55 x 123 ft., three stories and basement, estimated to cost $150,000. E. G. Carter is clerk.

The Rex Typewriter Co., Fond du lac, Wis., is purchasing a small list of additional equipment and increasing its operating force gradually to facilitate quantity production of a new design of portable and demountable typewriter which has been perfected and is ready for the commercial market. An output of 100 to 125 machines a day is expected to be reached by Jan. 1.

The Burdick Cabinet Co., Milton, Wis., manufacturer of cabinets, radio cases, talking machine panels, etc., has engaged the Federal Engineering Co., 444 Milwaukee Street, Milwaukee, to design a brick and steel manufacturing addition, 80 x 160 ft., part two stories and basement, estimated to cost $50,000. Specifications of new equipment needs have not been completed.

The Motor Grinding Co., Milwaukee, is the style of a new corporation which has been organized to establish a general machine and repair business, specializing in regrinding gas engine cylinders. The incorporators are members of the law firm of Fish, Marshutz & Hoffman, 1115 Wells Building, Milwaukee.

The H. A. Poppert & Son Co., 421-423 Third Street, Mil-

waukee, manufacturer of metal and wood patterns, dies, etc., has increased its capital stock from $75,000 to $150,000. The plant has been undergoing general improvement and enlargement for the past six months. Russell L. Poppert is secretary and treasurer.

The E. J. Woodison Co., Detroit, Mich., foundry facings, equipment, fire brick, platers and polishers' supplies, maintaining a branch shop and warehouse at 484-494 Virginia Street, Milwaukee, has been granted a Wisconsin charter. The application gives the capital stock as $600,000 and the Wisconsin proportion as $19,470. J. M. Witters is manager of the Milwaukee branch.

The Manitowoc Foundry Co., Manitowoc, Wis., has filed amendments to its corporate articles to effect a reduction in its capital stock from $50,000 to $30,000. David Balkansky is president, and H. L. Meyer, secretary.

The New Cornelia Copper Co., Ajo, Ariz., will build a new concentrator plant costing about $500,000 and has let the structural steel, amounting to 2,500 tons, to the Wisconsin Bridge & Iron Co., Milwaukee.

The Cleveland-Cliffs Iron Co., Cleveland, has acquired the entire properties of the Interstate Coal & Dock Co. at Green Bay, Wis., a port which accommodates the largest vessels operating on the Great Lakes. W. J. McCormick has been appointed resident manager. The property is to be improved and enlarged, but no definite details have been made public.

Indiana

INDIANAPOLIS, Sept. 18.

The Duesenberg Co., South Harding Street, Indianapolis, is said to be arranging a list of equipment for installation in its new one-story plant addition, 60 x 200 ft., on which construction was recently commenced, to be used for motor assembling. Chester S. Ricker is manager in charge.

The Studebaker Corporation, South Bend, Ind., manufacturer of automobiles, has awarded a contract to the J. G. Christman Co., South Bend, for the erection of two additional floors on the present two-story plant structure known as Building 79. Work will be commenced at once. Albert Kahn, 1000 Marquette Building, Detroit, is architect.

The Terre Haute, Indianapolis & Eastern Traction Co., Indianapolis, is completing plans for the erection of an addition to its electric power plant on West Tenth Street, and for extensions in its transmission system in this section. The work will include the installation of new equipment.

A vocational department will be installed in the new high school addition at Bloomington, Ind., now in course of erection, estimated to cost about $200,000.

Electric pumping machinery and auxiliary mechanical equipment will be installed in the new water plant to be constructed by the Upland Water Co., Upland, Ind. The Public Service Commission has granted permission for a bond issue of $45,000.

The Interstate Public Service Co., Indianapolis, is planning for extensions and improvements in its plant and system to cost about $500,000. Harry Reid is president.

The Wabash Electric Co., Clinton, Ind., has tentative plans under consideration for extensions and improvements in its plant and system to cost about $50,000.

The Pacific Coast

SAN FRANCISCO, Sept. 16.

The Doble Steam Motors Co., 714 Harrison Street, San Francisco, manufacturer of steam-operated automobiles, will soon take bids for the erection of a new plant at Atascadero, Cal., to consist of a main one and one-half story works, 100 x 500 ft., estimated to cost approximately $100,000, including machinery. The Home Builders' Service Bureau, Atascadero, is architect.

The San Gorgonia Power Co., First National Bank Building, San Francisco, has preliminary plans under way for the erection of a new hydroelectric power plant on the San Gorgonia River, San Bernardino County, Cal., with initial capacity of 4900 hp., estimated to cost approximately $300,000, including machinery and transmission line. Application has been made to the State Water Supply Commission for permission to use the power site.

The Orestimba Union High School District, Newman, Cal., has plans nearing completion for the erection of a new one-story vocational shop at the local high school. W. F. Reid, Concord, Cal., is clerk of the district board.

Edward Fletcher, 920 Eighth Street, San Diego, Cal., is forming a company to construct and operate a hydroelectric power plant on the Santa Ysabel and Black Canyon Creeks. It will have an initial capacity of about 3100 hp. and is estimated to cost approximately $350,000.

H. V. Glore, 2053 Thirty-eighth Avenue, Oakland, Cal., is planning for the erection of a new one-story machine shop on Fifth Street, near Alice Street.

The San Joaquin Light & Power Corporation, Fresno, Cal., has preliminary plans under consideration for the erection of a new hydroelectric generating plant on Whisky Creek, with capacity of about 24,000 hp. Application has been made to the State Water Supply Commission for permission to build the plant.

The Atchison, Topeka & Santa Fe Railway Co., Kerckhoff Building, Los Angeles, Cal., has awarded a contract to Charles A. Fellows, 500 Central Building, for the erection of a new one-story machine shop at Aubuquerque, N. M., 141 x 415 ft., divided into heavy machinery and erecting bays, respectively. A one-story adjoining building will be built for mechanical service, 84 x 86 ft. The installation will include a 90-ton and 15-ton electric traveling cranes.

The Union Pressed Steel Co., Twenty-ninth Avenue and Ford Street, Oakland, Cal., is planning for the rebuilding of its plant, destroyed by fire Sept. 2, with loss estimated at about $125,000, including machinery. The company is operated by the Union Construction Co.

The Central South

ST. LOUIS, Sept. 18.

THE list of machine tools and allied equipment inquired for by the Missouri, Kansas & Texas Railroad, comprising 116 items, for its shops at Bellmead, near Waco, Tex., closed to-day. Among the items listed were the following: Air compressor, feed water heater and pumps, water tube boilers, electric traveling cranes, armature machines, sensitive drills, band saw, rip saw, cut-off saw, squaring shear, splitting shear, tinner's roll, pipe threading machines, hydraulic driving box press, journal turning lathe, car wheel lathe, boring and turning mill, driving wheel press, piston rod grinding machine, hydraulic press, plain milling machines, draw-cut shaper, crank shapers, vertical turret lathes, vertical boring and turning mills, heavy duty planer, heavy duty slotter, emery wheel grinding machines, power hack saws, horizontal boring and drilling machine, crank planer, double-head bolt cutter, triple-head bolt cutter, rotary cold cut-off saw, high-power drilling machines, locomotive guide bar grinding machine, duplex locomotive rod boring machine, disk grinders, universal milling machines, drill grinder, engine lathes, electric tool hardening furnace, electrically heated oil tempering furnace, gas-fired oven furnace, multiple spindle drilling machine, staybolt drilling machine, plate annealing furnace, upright drill, flange clamps, double-end punch and shear, plate bending rolls, portable electric arc welders, pneumatic flanging machine, flue shop equipment, single-frame steam hammers, bar shear, bulldozer, forging machine, forge blower, turret lathes, centering machines, horizontal punch, electric rivet heaters, die grinder, link grinder, Fox lathes, clamp press.

The Kansas City Southern Railroad, Kansas City, Mo., has preliminary plans in progress for the erection of new locomotive and car shops at Pittsburg, Kan., to consist of a number of buildings, including steel car shop, engine shop, power house, etc., estimated to cost in excess of $1,000,000, including machinery.

The St. Louis Wire & Iron Co., 926 Chauteau Avenue, St. Louis, has awarded a contract to George Moeller, 3520 Staska Avenue, for the erection of a two-story and basement addition, 50 x 150 ft., estimated to cost $40,000.

The Common Council, Rich Hill, Mo., has approved a bond issue of $20,000, the proceeds to be used for the purchase of new equipment for installation in the municipal electric power plant.

The Kansas City Power & Light Co., Kansas City, Mo., has arranged for a bond issue of $21,000,000, a portion of the proceeds to be used for extensions and improvements. Work is now in progress for an increase in the capacity of the Northeast power plant from 60,000 to 90,000 kilowatts. Joseph F. Porter is president.

The Shaffer Refining Co., Cushing, Okla., has tentative plans under consideration for extensions and improvements in its oil refineries to cost about $500,000, including equipment. It is proposed to install a new four-unit cracking plant.

The Norton Taxi-Cab Co., Joplin, Mo., has plans under way for the construction of a new two-story and basement automobile service and repair works, 100 x 155 ft., on Wall Street, for company cars.

The Wichita Sheet Metal Works, 2400 East Douglas Street, Wichita, Kan., is planning for the installation of new equipment at its plant, including power lathe, drill press, hand tools, etc.

The Nashville Bridge Co., Nashville, Tenn., has acquired property totaling about 14 acres of land at Bessemer, Ala., and has plans in progress for the erection of a new steel fabricating plant for structural shapes. The works will consist of a number of buildings, estimated to cost in excess of $85,000, including equipment.

The Signal Mountain Mining Co., Chattanooga, Tenn., is planning for the development of extensive coal properties in the Suck Creek field, and will install electrical and other equipment, including hoisting machinery, conveying apparatus, etc. The project is estimated to cost close to $200,000. L. S. Berg is secretary and general manager.

The Wichita Auto Spring Works, 141 South Washington Street, Wichita, Kan., is planning for the installation of additional equipment in its repair department, to be used both for automobile and wagon work. C. E. Rischel heads the company.

The Marland Refining Co., Ponca City, Okla., is perfecting plans for extensions in its local oil refinery to increase the capacity from 6000 bbls. of refined products per day to 14,000 bbls. A number of new plant units will be constructed, to include a large addition to the storage and distributing plant, with the installation of new steel tanks, pumping equipment, etc., to provide an ultimate capacity of 1,900,000 bbls. A new waterworks system, with electrically-operated pumping machinery, will be installed. The entire project is estimated to cost about $1,500,000.

The Louisville Gas & Electric Co., 311 West Chestnut Street, Louisville, will commence the immediate erection of a new one-story cable house and works, 100 x 100 ft., with extension, 20 x 300 ft., on Washington Street, near Third Street, estimated to cost close to $1,000,000, including equipment. Donald McDonald is president.

The Douglas Coal Mining Co., 504 Fourth and First National Bank Building, Nashville, Tenn., recently organized, is planning for the development of properties in the vicinity of Island, Ky., to include the installation of electrical machinery, hoisting equipment, mine cars and other mechanical apparatus for a daily capacity of about 400 tons. A. C. Lackel is president.

The Tennessee Power Co., Parksville, Tenn., has been granted permission by the State Public Utility Commission to issue bonds for $250,000, the proceeds to be used for plant and system extensions and improvements.

The Common Council, Vinita, Okla., is planning for the construction of a municipal hydroelectric power plant on the Grand River. Work will be placed under way at an early date.

The Atkinson Armature Works, Pittsburg, Kan., has awarded a contract to the Helman Rogers Construction Co., Pittsburg, for the erection of a one-story and basement addition to its electrical equipment plant, 45 x 90 ft.

R. W. Parks, Wichita, Kan., operating a woodworking plant at 1832 South Wichita Street, is planning for the installation of new machinery, to include a saw, lathe, planer and other tools.

A vocational department will be installed in the new high school to be erected at Belle, Mo., estimated to cost close to $100,000 with equipment.

The Gulf States

BIRMINGHAM, Sept. 18.

Bids will be received by M. T. Sharp, city clerk, Corinth, Miss., until Sept. 26, for the installation of a complete municipal electric light and power plant. Fuller & Beard, 616 Title Guarantee Building, St. Louis, Mo., are consulting engineers.

The Modern Truck Mfg. Co., P. O. Box 1589, Mobile, Ala., recently organized, has acquired the local plants of the Modern Welding & Blacksmithing Co. and the Marine Equipment Co. The plants will be remodeled and improved, and both used by the new owner for the manufacture of a special tubular steel hand truck, gearing and transmission equipment for lumber mill machinery and other kindred mechanical products. Additional equipment will be installed. G. M. Bryde is general manager.

The Hialeah Coach Co., Hialeah, Fla., has tentative plans under way for the erection of a new plant for the manufacture of six-wheel coaches and other vehicles and parts. John Thiel is general manager.

The Standard Electric Works, Montgomery, Ala., recently organized, has arranged for the establishment of a plant at 17 Bibb Street, for the rebuilding and repair of electric motors and other electrical equipment. The company is headed by G. T. Key, Jr., and W. J. Howard.

The Citizens Light & Power Co., New Orleans, La., has plans under way for the construction of an addition to its electric generating plant on Carrollton Avenue, estimated to cost about $200,000, including machinery. H. K. Johnson is general manager.

The Common Council, Rayville, La., is planning for a bond issue of $150,000, for the installation of a municipal electric light and power plant.

The Van de Graff Coal Co., Tuscaloosa, Ala., recently organized, has acquired the local properties of the Brookwood Coal Co., and plans for an increase in the present output of about 50 tons a day. New electrical and mechanical equipment will be installed, including motors, hoisting equipment, mine cars, etc. Hargrove Van de Graff is president and general manager.

The Hardaway Construction Co., Marianna, Fla., is planning for the erection of a new hydroelectric power plant on the Chipola River. Permission to use the site has been secured from the Federal Water Power Commission, Washington, D. C. The plant is estimated to cost in excess of $100,000.

The Lone Star Gas Co., Dallas, Tex., is arranging a fund of about $1,000,000 for extensions and improvements, including the construction of a new compressor plant, pipe lines, auxiliary stations, etc. Work will be placed under way at an early date.

Canada

TORONTO, ONT., Sept. 18.

INQUIRIES for machinery and machine tools are beginning to make their appearance in larger numbers and dealers are of the opinion that many of these now coming in will shortly turn into actual sales. The greater part of the present demand, however, is one or two machines or tools to a customer. Manufacturers are fairly active and the majority are now operating between 75 and 100 per cent of capacity. The slight improvement which recently made its appearance in the fuel market is helping to stimulate activity in practically all lines of industry and many of those concerns which were beginning to think that it would be necessary to curtail operations are becoming optimistic and as a result the demand for equipment for replacement purposes is beginning to strengthen. Inquiries from concerns with industrial plants under construction are leaving the impression that a considerable buying movement will shortly develop from this source. Several automobile concerns have plants underway for which no equipment has so far been purchased. Canadian railways are still holding back but it is the opinion among dealers and manufacturers that buying from these will shortly be resumed on a more extensove scale.

The Sturgis Baby Carriage Co., Ltd., 60 Sumach Street, Toronto, Ont., contemplates establishing a manufacturing plant at Brampton, Ont.

The Dodds Canadian Iron Works, Ltd., recently incorporated with a capital stock of $200,000, will establish a plant at Welland, Ont., for the manufacture of flour mill machinery and equipment. The company has secured temporary quarters in the old M. Beatty & Son's plant there.

The Dominion Sheet Metal Corporation, Hamilton, Ont., is enlarging the capacity of its plant. When the addition is completed it will have capacity for 100 tons of galvanized sheets a day.

The Canadian By-Products Co., Ltd., Hamilton, Ont., has been incorporated with a capital stock of $600,000, for the purpose of manufacturing fire brick. The company will erect a modern plant with a capacity of 20,000 fire brick and miscellaneous refractories per day. The officers of the company include: President, Wendell L. Whitehouse; vice-president, George W. Esslinger; secretary, Capt. Chauncey H. Derby; treasurer, Earl V. Wagner, all of Scranton, Pa. Directors include Ernest H. Darling, C. V. Langs and John C. Callaghan of Hamilton, Ont.

The British Empire Steel Corporation, Sydney, N. S., has announced that wage increases running from 10 to 15 per cent and affecting all classes of workers at the steel plant will become effective shortly. The rate paid for common labor is increased from 24½ and 26 cents per hour to 28 and 30 cents per hour.

IRON AND INDUSTRIAL STOCKS

Hesitancy in Stock Trading Owing to Uncertainties of Market

Conditions in steel movement have taken a new tack, the checking element now being the limit on shipment in place of the limit on production. Various embargoes between certain points virtually preclude shipment. There is great concern over the car shortage, which before long will mean a piling up of steel products at the source. Relatively little business was placed at the prevailing high prices, which are regarded as premiums for prompt delivery. An undertone of hesitancy dominates stock trading. Though appearances would point to a strong rising market, no actual advances of moment are noted. The week's turnover was light and, in most cases, if prices were shorn of quick delivery premiums, advances would be negligible. In many quarters there is strong expectancy of a revival on a lower, firmer basis after a few months shall have removed the cause of delivery premiums.

The range of prices on active iron and industrial stocks from Monday of last week to Monday of this week was as follows:

	Low	High		Low	High
Allis-Chalm.	57½	59⅝	Gulf States Steel.	82½	85¼
Allis-Chalm. pf...	101¼	103½	Harbison Walker.	110	110
Am. B. S. & Fdry.	81½	81¾	Inland Steel.....	50	50
Am. B. S. & F. pf.	110	112	Int. Har, new.....	110¾	113½
Am. Can.....	61½	63¾	Lackawanna Steel.	79	82
Am. Can pf.....	109½	110	Lima Loco.....	62⅝	64½
Am. Car & F.....	188	193	Midvale Steel.....	34	35
Am. Car & F. pf..	122½	125	Nat.-Acme	15⅝	16⅞
Am. Loco.....	122⅝	127¾	Nat. E. & Stm....	61	62¾
Am. Loco. pf.....	121	121½	Nat. E. & Stm. pf.	102	103
Am. Radiator.....	117½	122	N. Y. Air Brake..	77	84
Am. Stl. F.....	42½	46⅛	Nova Scotia Steel.	37½	40
Am. Stl. F. pf....	106	106½	Otis Steel.....	10¾	11¾
Bald. Loco.....	135½	140⅛	Pittsburgh Stl. pf.	97	97
Bald. Loco. pf....	114	115	Pressed Stl. Car..	89¾	95¼
Beth. Steel.....	76	77⅞	Pressed Steel, pf.	104	106
Beth. Stl. Cl. B...	77⅞	79⅜	Ry. Steel Spring..	119⅞	126¼
Beth. St. 8% pf..	114⅝	115½	Ry. Stl. Spring pf.	115	115
Brier Hill. pf.....	19	19	Replogle Steel....	32⅞	35
Br. Em. Steel....	12¾	14½	Republic	69½	71¾
Br. Em. S. 1st pf.	74⅞	75	Republic pf.....	92⅝	92⅞
Br. Em. S. 2d pf..	36½	39	Sloss	49½	51¼
Cambria Steel....	90	90	Sloss pf.....	78¾	78¾
Chic. Pneu. Tool.	80⅝	87	Steel of Canada...	77¼	80
Colo. Fuel & Iron.	32½	36⅜	Superior Steel....	33	34¼
Crucible Steel....	92	96⅜	Superior S. 1st pf.	90	91
Crucible Steel pf..	95½	98	Un. Alloy Steel...	37	38½
Deere, pf.....	76¾	78¾	U. S. Steel.....	104½	106¾
Dom. Steel.....	40	40	U. S. Steel pf.....	121½	122⅞
Gen. Electric.....	179	183	Vanadium Steel...	51	53
Gt. No. Ore Cert..	40⅝	42	W'house Air Br...	102	104

Industrial Finance

At the annual stockholders' meeting of the Vanadium Corporation of America J. Leonard Replogle, chairman of the board, stated that the August earnings will be in excess of $90,000 net after all charges. Vanadium's current liabilities approximate $40,000, while quick assets are around $3,600,000, roughly 90 times its liabilities.

The Associated Motor Industries, a merger comprising eight motor and machine manufacturers, in its first balance sheet, as of July 15, showed total assets of $20,254,031, of which $9,564,555 were current and $10,135,378 represented land, buildings and equipment less depreciation. Current liabilities aggregate $1,210,060, which with $3,000,000 first mortgage bonds, $3,542,138 notes and dealers' deposits, $75,000 for reserve and $12,426,822 capital liabilities and surplus, made total liabilities $20,054,021.

Directors of the Youngstown Sheet & Tube Co., Youngstown, last week increased its common dividend from 50c. to 75c., owing to improved earnings. At the same time the regular preferred dividend of $1.75 per share was authorized. Both payments are due on Oct. 1 to stock of record Sept. 20. Since July 1, 1921, the company has been paying 50c. per share quarterly on its common stock. From the standpoint of earnings, June was the best month of the year for the company, and the third quarter showed a substantial gain both in gross and net earnings over the second quarter.

Directors of the Newton Steel Co., Youngstown, Ohio, have declared the regular quarterly dividends of $1.50 per share on common and $1.75 on preferred, both payable Oct. 1 to holders of record Sept. 20.

The Auto Accessory & Repair Co., 405 West Monument Street, Baltimore, Md., has been incorporated with a capital of $20,000, to manufacture automobile equipment and operate a general machine repair works. At present it is doing only garage work, specializing in auto brake relining under the Raybestos Co. The incorporators are A. C. and G. E. Hull and J. W. B. Ballinger.

Plans of New Companies

The Hendry Machine & Engineering Co., Fort Myers, Fla., was recently incorporated with a capital stock of $50,000, to manufacture iron and steel products. Its buildings are complete, but it will be in the market for machinery. B. L. Hendry is president, L. Hendry vice-president and W. F. Lusk secretary, all of Fort Myers.

The Bronze Hardware Mfg. Co., Buffalo, N. Y., has been incorporated with a capital of $100,000, to manufacture hardware products. It will manufacture its own products. Sufficient equipment has been purchased to start operations. The incorporators are: W. H. and E. K. Barlow and W. O. Kuhn. D. E. Hart, attorney, Buffalo, represents the company.

The Universal Darning Machinery Corporation, 30 Church Street, New York, was recently incorporated with a capital of $500,000, to manufacture textile machinery and parts. Tentatively, it will lease a plant, preferably in Brooklyn, but expects to erect its own buildings as soon as operations are well under way. It is in the market for its entire equipment. The incorporators are S. Sims and C. M. Fyfe.

The Hartford Valve Mfg. Co., Hartford, Conn., has been incorporated with a capital of $50,000, to manufacture valves and kindred engineering specialties. Arrangements have been made for manufacturing a flush valve which has previously been made by the M. S. Little Mfg. Co. The incorporators are H. B. Carey, M. S. Little and M. H. Flynn, 113 Whitney Street, Hartford, Conn.

The Amplex Engineering Corporation, 52 Vanderbilt Avenue, New York, recently organized, has leased a plant and has purchased part of the necessary equipment. It is still receiving bids on the rest. This company was incorporated with a capital of $100,000, to manufacture packing wire baling and other mechanical specialties. The officers are: N. M. Goodlett, president; J. A. Rietmann, vice-president, and E. Palmer, secretary-treasurer.

The Open-Hearth Fire Brick Co., Wilmington, Del., has been incorporated with a capital stock of $500,000, to manufacture fire brick and other refractories. It expects to erect a plant and will be in the market for equipment. The company has over 1000 acres of upper Freeport coal seam, having taken over the plant formerly operated by W. A. McCreary, Freeport, Pa. Sleeves, nozzles, runner brick and silica brick will be the chief products. H. O. Williams, 1407 Keenan Building, Pittsburgh, is the corporate representative.

The Sutwa Mfg. Co., 17 West Forty-second Street, New York, has been incorporated with a capital of $100,000, to manufacture hangers and other metal products. For the present its manufacturing will be contracted for, but later it may put up a plant of its own. The incorporators are M. G. Newman, D. M. Meyers and C. Weil.

The Hydraulic Elevator & Machine Co., New York, was recently incorporated with a capital of $25,000, to manufacture hydraulic elevator equipment and parts. Its manufacturing will be done by the Thurber Elevator Co. The incorporators are J. O'Rourke, J. F. Higgins and M. Butler. Dooling & Waldman, 141 Broadway, New York, represent the new company.

The Henry Forge & Tool Co., Inc., Auburn, N. Y., has been incorporated with a capital stock of $200,000, to manufacture tools and machinery. It will specialize in drop forgings and machined parts for all purposes. Contracts have been awarded and the buildings are under construction. A large portion of the equipment has been purchased. The management expects to be in operation Jan. 1, next. W. J. Henry is president; W. M. Henry, vice-president and treasurer, and F. A. Henry, secretary.

The Plate Glass Machine Co., Butler, Pa., was recently incorporated to manufacture glass making machinery and parts. All its work is to be done by contract. F. E. Troutman, Butler, Pa., is treasurer.

The Universal Burner Co., manufacturer of liquid fuel burning equipment, Logansport, Ind., recently incorporated under the laws of Indiana at $25,000, all common stock, expects to build all of its equipment with the exception of large air compressors and steam pumps, which it will purchase on the market. It will also purchase motors for use in connection with small units and motor-driven oil pumps. The company is manufacturing oil burners for all industrial uses. It has a staff of engineers and has designed a burner eliminating the use of all needle valves and controlling the oil with a self-cleaning valve which will permit the use of the heavier grades of fuel oil without clogging. By the arrangement of a cone on the end of the valve, both mechanical and air atomizing is applied to the fuel, assuring complete combustion of the oil within the furnace.

ZINC COATING ON SHEETS*

Method for Determining the Amount by Measuring the Rise in Temperature of the Acid Employed

THIS paper describes a new method for the determination of spelter coating on iron and steel sheets, the value of the method lying in the fact that coating weights can be determined without the use of the analytical balance. A galvanized specimen is immersed in a measured amount of acid, the maximum temperature rise being recorded. Each one-tenth degree rise in temperature is equivalent to a definite weight of zinc.

Apparatus and Manipulation

The equipment needed consists of a ground-stoppered bottle containing concentrated hydrochloric acid, a graduated volumetric flask used to measure the acid, a testing jar, and a thermometer. Providing the sides and bottom are not too thick, almost any container would be satisfactory. The size of the jar should be approximately 2½ in. in diameter. An elliptical shaped container is very advantageous, as will be pointed out hereafter. The thermometer is the only precision instrument needed, being, in fact, the only item of apparatus which is in any way costly. It should be graduated in tenths of a deg. C. with a range of, perhaps, 50 deg. (90 deg. Fahr.)

A measured amount of concentrated hydrochloric acid is poured into the testing jar. The base metal may be slightly attacked without danger to accuracy, consequently, it is not necessary to add antimony trichloride to the acid. The volume of the acid chosen regulates the conversion factor, that is, the value in grams for each 0.1 deg. C. rise in temperature. The smaller the volume of acid used the greater will be the rise in temperature for each gram of zinc dissolved. Several series of experiments were run using volumes of acid which varied in amounts from 100 to 300 cc. and, although the conversion factor was different for each volume used, nevertheless the coating weight was accurately determined regardless of the acid volume employed. It must be pointed out, however, that when an exceptionally high coating weight is determined (3 or 4 oz. per sq. ft.) the acid volume for the usual size of specimen should never be less than 300 cc. The shape of the testing jar regulates to some extent the volume of acid needed. It is obvious that sufficient acid must be present to insure complete immersion of the sample. A smaller volume of acid can be used for the same height test piece if the tumbler is elliptical in shape rather than circular.

Other Shapes of Containers

Experiments were also conducted using a container rectangular in shape. Very close checks were obtained using all the various shaped containers mentioned. The height of the container is not important except that it must be at least of such height that no acid bubbles out at the moment the evolved gas causes the liquid to rise.

After the acid is poured into the container it is stirred thoroughly to insure an equalized temperature. The thermometer is immersed in the liquid, and when the temperature is constant the reading is recorded. The galvanized specimen is immersed in the acid (the spelter coating dissolving very rapidly), the heat evolved being absorbed by the acid. The action is so rapid that the spelter is dissolved and the maximum temperature reached in about 30 or 40 sec.; consequently, radiation does not interfere with accuracy. The maximum temperature is then recorded. The rise in temperature multiplied by an experimental conversion factor gives the grams of zinc originally carried by the test piece. The entire time required for a determination is very short, the entire operation being finished in 3 min. or less.

Samples and Experimental Data

The samples used must be clean. For this reason it is customary to wash them off with gasoline. The size of the sample is immaterial except that it must not be too large for the testing jar. Since the coating weight is customarily reported in ounces per square foot, a 2¼ by 2¼-in. test piece has been found convenient, as the weight of zinc in grams is then numerically equal to the ounces per square foot desired. When only irregularly shaped pieces are available, it is advantageous to use a planimeter for accurately measuring surface areas. The sample is placed on a sheet of plain white paper and a pencil run around the edge. The area of this figure, which is the area of the test piece, may then be read directly by means of the planimeter. The area obtained may be compared to the area of a 2¼ by 2¼-in. specimen (5.06 sq. in.) and the ounces per square foot calculated by proportion.

The table contains experimental data which shows the accuracy of the temperature rise method. The determinations obtained by the temperature rise method are compared with results obtained by the hydrochloric acid method. These comparative figures are all the more interesting because they are absolute comparisons. Each sample was weighed before the coating weight was determined by the temperature rise method. When the temperature was recorded the sample was dried and re-weighed, the difference in weight giving the coating weight by the hydrochloric acid method. The same sample was thus used for both determinations.

Table of Experimental Data on Temperature Rise Method of Coating Determination

Material	Size, In.	Gage No.	Vol. of Acid Used, cu. cm.	Conversion Factor for Volume Used	Temperature Rise, Deg. C.	Grams of Zinc by Temperature Method	Grams of Zinc by HCl Method	Difference
Galvanized iron	2 x2	14	100	0.168	11.0	1.85	1.85	0.00
Galvanized iron	2 x2	14	100	0.168	12.1	2.03	2.02	0.01
Galvanized iron	2 x2	10	100	0.168	12.0	2.02	1.98	0.04
Galvanized iron	2 x2	16	100	0.168	8.4	1.41	1.42	0.01
Galvanized iron	2¼x2¼	28	100	0.168	5.2	0.87	0.88	0.01
5 nails, electro galvanized	.....	..	120	0.191	3.0	0.57	0.60	0.03
10 nails, electro galvanized	.....	..	120	0.191	5.5	1.05	1.10	0.05
5 nails, hot-dip galvanized	.....	..	120	0.191	13.0	2.48	2.43	0.05
10 nails, hot-dip galvanized	.....	..	120	0.191	24.0	4.58	4.62	0.04
Metallic zinc sawings	.....	..	120	0.191	3.5	0.67	0.70	0.03
Metallic zinc sheet	.....	..	120	0.191	9.0	1.72	1.70	0.02
Metallic zinc sawings	.....	..	120	0.191	9.0	1.72	1.70	0.02
Metallic zinc sheet	.....	..	120	0.191	25.0	4.77	4.71	0.06
Galvanized iron	2 x3	26	120	0.191	10.5	2.01	2.02	0.02
Galvanized steel	2 x3	26	120	0.191	9.5	1.81	1.82	0.01
Galvanized steel	2 x3	26	120	0.191	8.5	1.62	1.68	0.06
Galvanized steel	2 x2	16	120	0.191	8.0	1.53	1.52	0.01
Galvanized steel	2 x2	16	120	0.191	7.0	1.34	1.34	0.00
Galvanized iron	2 x3	16	120	0.191	11.0	2.10	2.06	0.04
Galvanized iron	2 x2	16	120	0.191	12.0	2.29	2.27	0.02
Galvanized iron	irregular	20	120	0.191	8.3	1.59	1.61	0.02
Galvanized iron	2¼x2¼	12	120	0.191	15.0	2.87	2.88	0.01
Galvanized steel	2¼x2¼	16	200	0.305	4.1	1.25	1.28	0.03
Galvanized steel	2¼x2¼	24	200	0.305	3.9	1.19	1.23	0.04
Galvanized steel	2¼x2¼	24	200	0.305	4.1	1.25	1.26	0.01
Galvanized steel	2¼x2¼	24	200	0.305	4.2	1.28	1.29	0.01
Galvanized steel	2 x2	24	200	0.305	6.7	2.04	2.04	0.00
Galvanized iron	2 x2	20	200	0.305	7.3	2.23	2.23	0.00
Galvanized iron	2 x2	20	200	0.305	7.2	2.20	2.20	0.00
6 rivets	.....	..	200	0.305	1.3	0.40	0.41	0.01
Galvanized iron	2¼x2¼	10	300	0.425	10.1	4.29	4.25	0.04
Galvanized iron	2¼x2¼	10	300	0.425	12.3	5.22	5.30	0.08

[1] J. A. Aupperle, "The Determination of Spelter Coating on Sheets and Wires." *Proceedings*, Am. Soc. Test. Mats., Vol. XV, Part II, p. 120 (1915).

Application to Other Products

The application of the method is not limited to sheet metal alone, but can be used equally as well for rivets, nails, wire or anything in fact which carries a coating weight and on which the surface area can be determined.

The temperature rise method of coating determination is very serviceable for field tests. The equipment needed can easily be packed in a small box and carried from place to place. The testing jar and the thermometer take the place of the analytical balance. To test a sample in the field it is only necessary to clip a piece from the sheet to be tested and drop it in the acid, after which the temperature rise is recorded.

*From a paper presented at the annual convention of the American Society for Testing Materials at Atlantic City, June 26 to 29. The author, D. M. Strickland, is research engineer the American Rolling Mill Co.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

Bars:	
Refined iron bars, base price	2.94c.
Swedish bars, base price	7.00c.
Soft steel bars, base price	2.94c.
Hoops, base price	4.29c.
Bands, base price	3.74c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	3.04c.
Channels, angles and tees under 3 in. x ¼ in., base	2.94c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	2.94c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.14c.
Toe-calk, ½ x ⅜ in. and larger	4.00c.
Cold-rolled strip, soft and quarter hard	6.75c. to 7.25c.
Open-hearth spring steel	4.50c. to 7.00c.
Shafting and Screw Stock:	
Rounds	3.90c.
Squares, flats and hex	4.40c.
Standard cast steel, base price	15.00c.
Extra cast steel	18.00c.
Special cast steel	23.00c.

Tank Plates—Steel

¼ in. and heavier	3.04c.

Sheets

Blue Annealed

	Per Lb.
No. 10	4.04c. to 4.19c.
No. 12	4.09c. to 4.24c.
No. 14	4.14c. to 4.29c.
No. 16	4.24c. to 4.39c.

Box Annealed—Black

	Soft Steel C. R., One Pass, Per Lb.	Blued Stove Pipe Sheet, Per Lb.
Nos. 18 to 20	4.30c. to 4.70c.	.....
Nos. 22 and 2	4.35c. to 4.75c.	5.00c.
No. 26	4.40c. to 4.80c.	5.05c.
No. 28	4.50c. to 4.90c.	5.15c.
No. 30	4.75c. to 5.15c.	.....

No. 28 and lighter, 36 in. wide, 10c. higher

Galvanized

	Per Lb.
No. 14	4.60c. to 5.00c.
No. 16	4.75c. to 5.15c.
Nos. 18 and 20	4.90c. to 5.30c.
Nos. 22 and 24	5.05c. to 5.45c.
No. 26	5.20c. to 5.60c.
No. 27	5.35c. to 5.75c.
No. 28	5.50c. to 5.90c.
No. 30	6.00c. to 6.40c.

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
⅛ in. Butt..	—53	—38	¾ in. Butt....	—16	+2
¾ in. Butt..	—58	—45	1½ in. Butt..	—19	—1
1-3 in. Butt ..	—60	—47	2 in. Lap.....	—13	+4
2½-6 in. Lap.	—57	—44	2½-6 in. Lap..	—16	+1
7-8 in. Lap..	—53	—30	7-12 in. Lap...	— 8	+8
9-12 in. Lap.	—49	—30			

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	4.00c. to 4.25c.
Annealed soft	4.00c. to 4.25c.
Galvanized annealed	4.65c. to 4.90c.
Coppered basic	4.65c. to 4.90c.
Tinned soft Bessemer	5.65c. to 5.90c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	19¼c. to 20¼c.
High brass wire	20¼c. to 20¾c.
Brass rod	16¾c. to 17¾c.
Brass tube, brazed	26¼c. to 27¼c.
Brass tube, seamless	23 c. to 23½c.
Copper tube, seamless	25¾c. to 26 c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 22¾c. to 23¾c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14-20		
	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20		Primes	Wasters
			80 lb..	$6.05	$5.80
			90 lb..	6.15	5.90
			100 lb..	6.25	6.00
IC..	$10.00	$8.50	IC..	6.40	6.15
IX..	11.50	10.00	IX..	7.40	7.15
IXX..	13.00	11.25	IXX..	8.40	8.15
IXXX..	14.25	12.50	IXXX..	9.40	9.15
IXXXX..	16.00	14.00	IXXXX..	10.40	10.15

Terne Plates

8-lb. coating, 14 x 20

100 lb.	$7.00
IC	7.25
IX	7.50
Fire door stock	9.00

Tin

Straits, pig	36c.
Bar	43c. to 47c.

Copper

Lake ingot	15¼c.
Electrolytic	15 c.
Casting	14¾c.

Spelter and Sheet Zinc

Western spelter	8½c.
Sheet zinc, No. 9 base, casks	9¼c. open 9¾c.

Lead and Solder*

American pig lead	6¾c. to 7c.
Bar lead	8c. to 8½c.
Solder, ½ and ½ guaranteed	25c.
No. 1 solder	23½c.
Refined solder	20¼c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	75c.
Commercial grade, per lb	35c.
Grade D, per lb	25c.

Antimony

Asiatic	7c. to 8c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb	25c. to 27c.

Old Metals

Trading is quiet but the market is strong. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	11.75
Copper, heavy wire	11.25
Copper, light and bottoms	9.25
Brass, heavy	6.25
Brass, light	5.25
Heavy machine composition	8.50
No. 1 yellow brass turnings	6.50
No. 1 red brass or composition turnings	8.00
Lead, heavy	4.50
Lead, tea	3.50
Zinc	3.25

THE IRON AGE

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Recent Developments in Fatigue of Metals

Effects of Heat Treatment—Testing Machine Now Used—Endurance Limit Defined—Machine Design and Localized Stress

BY H. F. MOORE* AND T. M. JASPER†

THE failure of metal parts of machines after thousands or millions of repetitions of a load which, for a time, apparently does no damage is a phenomenon which has become of prime importance to metallurgists, machine designers, and materials engineers. The term "fatigue" has been applied to such a failure, and the testing of metals for resistance to "fatigue" has come to be an important problem in the testing laboratory.

The historical development of testing for "fatigue" of metals has been so often summarized that no such summary will be attempted in this article, except to call attention to the demolishing of the theory that, under repeated stress, metals "crystallized," and the demonstration, by means of the metallographic microscope, that fatigue failure consists in the progressive spread of minute cracks across a member subjected to repeated stress.

During the war the subject of resistance to fatigue became of very great importance and, as a result of the attention called to the problem, there are in progress a number of important investigations of various phases of this problem. In this country important investigations are in progress at the following laboratories, and doubtless at other laboratories as well.

University of Illinois, investigation under the auspices of National Research Council, Engineering Foundation, General Electric Co., Engineering Experiment Station of the University of Illinois.

U. S. Naval Engineering Experiment Station, Annapolis, Md.

Cornell University, Ithaca, N. Y., investigation under the auspices of the U. S. Bureau of Mines.

Air Service Laboratories, McCook Field, Dayton, Ohio.

Aluminum Co. of America.

Although the above laboratories are all getting data of great value the opportunities for profitable research in fatigue of metals are very far from being exhausted. This particular field is one of prime importance and it would seem worthy the attention of any parties interested in engineering research.

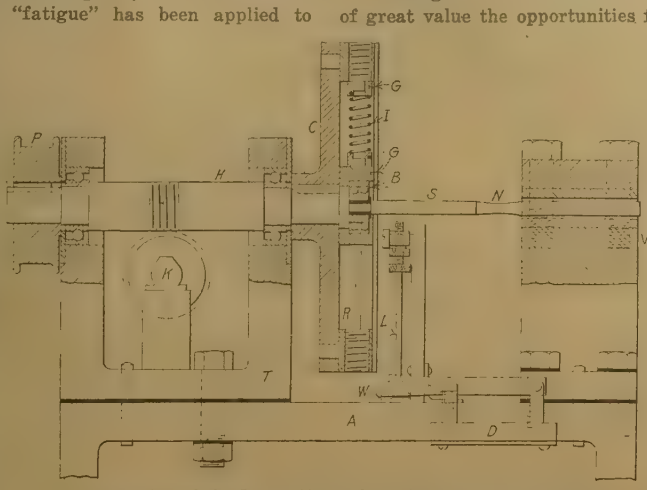

Fig. 1.—Section of the Latest Type of Testing Machine for Making Reversed Bending Tests as Used at the University of Illinois

Within the limits of this article it will not be attempted to give descriptions of special testing machines for making fatigue tests of metals*. It may be noted that most test results have been obtained by the use of reversed-bending tests of specimens. Probably there are many more machine members subjected to cycles of flexural stress than there are machine members subjected to cycles of direct axial stress.

Latest Type of Testing Machine Used.

Fig. 1 shows a diagram of the latest form of testing machine for making reversed bending tests, as used in the laboratories of the University of Illinois. In this machine the specimen S is held by one end in the vise V and the other end is rotated in a small circle being held in the bearing B. Sidewise pressure is brought on the bearing B by a calibrated indicator spring I and this pressure can be adjusted by means of a screw. The compression of the spring, and hence the load on the specimen is measured by means of a strain gage span-

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†Research assistant professor of engineering materials, University of Illinois, engineer of tests, investigation of the fatigue of metals.

*For descriptions of such machines see Unwin "The Testing of Materials of Construction," Chap. XVI.; B. Parker Haigh, "Alternating Stress Endurance of Steel," THE IRON AGE, May 11, 1916; Moore, Kommers and Jasper, "Fatigue or Progressive Failure of Metals under Repeated Stress," 1922 *Proceedings* of the American Society for Testing Materials.

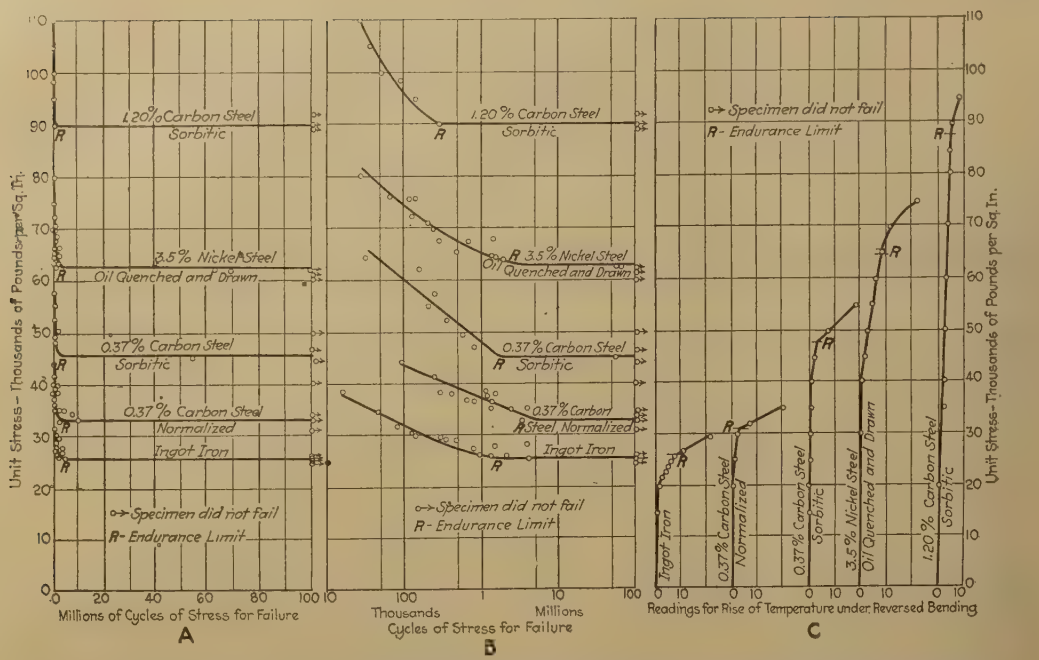


Fig. 2.—Typical Diagrams of Results of Repeated Stress Tests. Diagram (A) drawn to ordinary co-ordinates. Diagram (B) gives same test results as diagram (A), but is drawn to logarithmic co-ordinates

ning the gage holes GG shown near the ends of the spring. The rotating spring is carried in the crosshead C and sidewise motion of the bearing B is prevented by placing the bearing in a slot. Excessive displacement of the bearing when the specimen breaks is prevented by the rod R. The crosshead is driven by a shaft H, a pulley P and a motor not shown in the figure. The number of revolutions of the crosshead is measured by the revolution counter K which is driven by a worm on the drive shaft H.

When a test to destruction is carried out the fracture of the specimen occurs at the necked-down part N, and the broken end of the specimen hits a screw and kicks out the lever L. This releases the spring W, which then opens the motor switch D, thus stopping the machines.

This machine can be used for tests in which the rise of temperature of the specimen is measured. For this purpose fiber strips are placed between the headstock T and the base A, between the vise V and the base A, and a fiber bushing is placed between the end of the specimen and its bearing. A thermocouple (copper-constantan) is held against the specimen at the necked-down portion, and an opposed thermocouple is placed in an insulating bushing against the vise end of the specimen. From these couples wires lead to a delicate galvanometer. The fiber bushings serve to minimize the transfer of heat from the rotating parts of the machine.

The machine produces cycles of completely reversed bending stress, and can be run at a speed of 1800 r.p.m.

In studying the results of repeated-stress tests it is usually convenient to use a graph in which values of fiber stress computed by the ordinary formulas of mechanics of materials are plotted as ordinates and the numbers of cycles of stress necessary to cause failure are plotted as abscissae. Such a diagram has been given the name *S—N* diagram. Fig. 2 shows *S—N* diagrams for several typical series of tests of wrought ferrous metals in reversed bending. In Fig. 2 (a) the diagrams are plotted to ordinary coördinates; in Fig. 2 (b) the diagrams are plotted to semi-logarithmic coördinates. In Fig. 2 it will be noted that nearly all specimens which failed during the test failed below 10,000,000 cycles of stress. There seems to be a fairly well defined stress below which no failures occur, and at this stress the *S—N* diagram has a fairly well defined "break" and becomes horizontal, or very nearly so. That is, at this stress there seems to be a rapid change in the relation of fiber stress to number of cycles for rupture, and below this stress no failures occurred under 100,000,000 cycles of stress (one specimen run at a stress corresponding to the horizontal line has withstood 850,000,000 cycles of stress without rupture and another to 650,000,000 cycles.).

It can hardly be said dogmatically that this limiting stress is one which can be withstood for an infinite length of time because of the impossibility of testing to that point. Items of independent evidence however point to this endurance limit as the limiting value below which a ferrous metal will not fail, and these may be stated as follows:

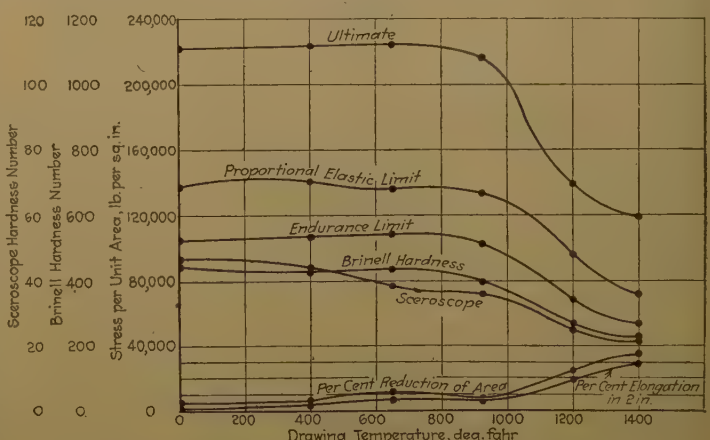


Fig. 3.—Effect of Varying Temperature of Draw on Tensile Strength, Hardness, and Endurance Limit of 1.20 Per Cent Carbon Steel

The first point of evidence is contained in the break in the stress-cycle curve at about 1,000,000 cycles.

A second is the horizontal nature of the curve after the break has been passed which, as far as has been tested, goes out beyond 850,000,000 cycles.

Some specimens which had run 100,000,000 cycles at the endurance limit without failure were again put into the machine at progressively higher stresses for a further 50,000,000 cycles per test until eventually a stress of 20 per cent above the original endurance limit in some instances was carried without failure. This constitutes a third point of evidence for the existence of a limiting stress for wrought ferrous metals below which failure will not occur under repeated stress. The specimens run at stress just below this limiting stress actually seem to be strengthened by the cycles of stress. Possibly this strengthening is due to cold-work during the progress of the test.

The endurance limit therefore has been defined for wrought ferrous metals as the stress below which a metal will withstand an indefinitely large number of cycles without failure and is found by locating the horizontal part of the stress-cycle curve.

Temperature Changes Under Repeated Stress

In connection with tests to failure under repeated stress, a study of temperature changes under repeated

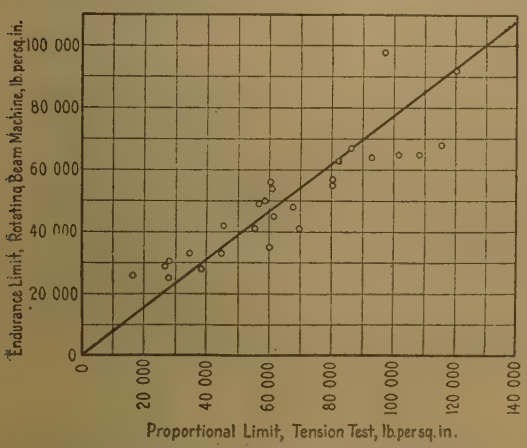


Fig. 5.—Correlation of Endurance Limit with Proportional Limit

stress gives data of interest for wrought ferrous metals. If a specimen is subjected to, say, a thousand reversals of stress below the endurance limit there is only a slight rise of temperature measurable with a delicate thermocouple and galvanometer,—only a few hundredths of a degree. If, however, the specimen is subjected to a thousand cycles of stress above the endurance limit it becomes "feverish" and shows a distinct rise of temperature. Fig. 2 (c) shows a diagram of test results plotted with fiber stresses as ordinates and rise of temperature after 1000 cycles of reversed bending stress as abscissas. The specimens were from the same bars of material as those from which were cut the specimens whose test results are shown in Fig. 2 (a) and Fig. 2 (b) and the distinct "break" of the temperature curve at the endurance limit is plainly shown.

This temperature test was first used by Stromeyer of Manchester, England. Recently Gough of the British National Physical Laboratory has made some tests which seem to give some promise that the deflection of a specimen under repeated cycles of reversed bending stress may also be used as a quick-test indicator of the endurance limit. This rise of

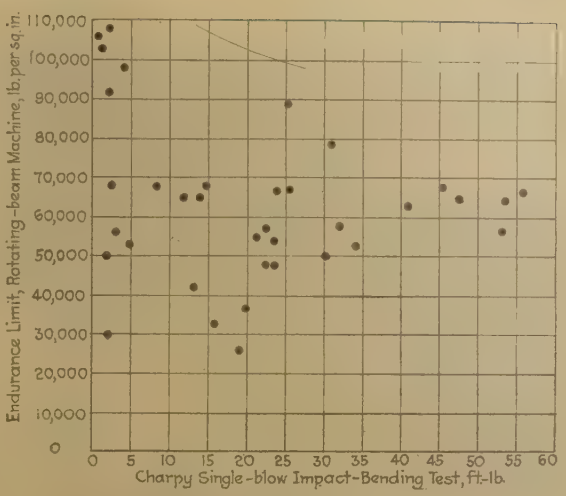


Fig. 4.—Correlation of Endurance Limit with Results of Charpy Single-Blow Impact-Bending Tests

temperature is a fourth item of evidence of some distinct development in internal progressive structural breakdown at the endurance limit.

All the foregoing discussion is applicable to wrought ferrous metals. Data are very few for non-ferrous metals, and almost entirely lacking for cast iron and steel castings. It is by no means certain that for non-ferrous metals there is a well-defined endurance limit, or that if such a limit exist, there is a well-marked development of heat under cycles of stress at that limit. The two fields of non-ferrous metals and of steel castings offer a wide opportunity for investigation.

Reversal of Axial Stress

As noted above most of the test results of repeated-stress tests have been obtained from tests in reversed bending. Some tests have been made on the resistance of steel to reversals of axial stress—a cycle of stress from tension to compression. British results seem to show that for such tests the endurance limit is slightly lower than for reversed-bending tests, and results at Illinois seem to show that the endurance limit is markedly lower than for reversed-bending tests. The British tests were mostly on normalized steel, while the results at Illinois were on sorbitic steel and on troostitic steel as well, and for the harder steels the discrepancy between tension-compression tests and reversed-bending tests was most marked.

Three explanations for the discrepancy are suggested:—

1.—Initial stresses, especially in heat treated steel:

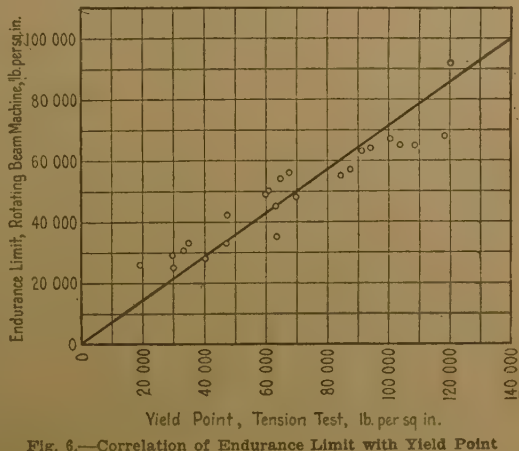


Fig. 6.—Correlation of Endurance Limit with Yield Point

as the outside surface of a specimen cools first the inside is in tension after final cooling. Hence in a bending test the outside is in initial compression and this initial compression must be overcome before the crystalline grains tear apart; in a tension-compression test the inside is in initial tension, and the tension applied during the test would be added to this initial tension.

2.—Tension-compression specimens (or parts) are never given an exactly axial load, there is always some eccentricity, and this means a higher maximum fiber stress than the computed tensile compressive stress.

3.—In a tension-compression specimen (or machine part) the whole area of cross-section is subjected to a maximum stress rather than the outside fibers only, as is the case with a flexural specimen; hence there would be more opportunity for the development of a crack into a fracture when all fibers were subjected to approximately the same stress.

Tests are in progress bearing on these three points, and while results so far obtained are tentative, the general indications seem to show that initial stress is an appreciable factor, especially for heat-treated steel; but that it can not explain all the observed discrepancies, that, since two machines of quite different design and action but each applying axial load to the specimen give fairly concordant results, the effect of eccentric loading can hardly be large, and that it seems reasonable to expect that, for specimens or machine parts in which a whole cross-section is subjected to maximum stress, the endurance limit will be somewhat lower than for specimens or machine parts subjected to repeated flexure. For rotating-beam tests the endurance limit is found at about one-half the static ultimate; for tension-compression tests of normalized or annealed steels the endurance limit is found at about one-third the static ultimate (this value should be regarded as tentative); and for heat-treated steels the results of alternate tension-compression tests give still lower values for endurance limit, for very hard steels, much lower.

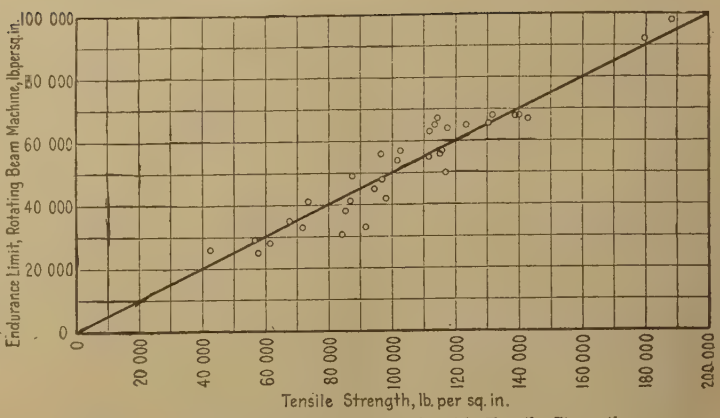


Fig. 7.—Correlation of Endurance Limit with Tensile Strength

Other Factors of Importance

In addition to the type of loading which has an effect on the strength of a metal in fatigue, the shape of a member under load and the surface finish are factors of importance. Poor surface finish may diminish the endurance limit by about 18 per cent. A sharp re-entrant angle may increase the liability of failure of a member 100 per cent, depending on the location of the sharp corner with reference to stress distribution.

Experiments recently made to determine the effect of an occasional heavy overload bring out the following facts: The endurance limit for complete reversal of stress is consistently below the static yield point for nearly all the materials tested. If the member is overloaded, say, 20 times to just below the yield point, the endurance limit is decreased by about 6 per cent only. If it is overloaded above the yield point to about 70 per cent above the original endurance limit the resulting endurance limit is lowered about 23 per cent.

The test method of overloading consists in placing the specimen in a universal testing machine and applying an axial tensile load 20 times and then immediately placing the specimen in a rotating-beam fatigue testing machine. The endurance limit for specimens which are introduced into a bath of boiling water immediately after overloading and allowed to boil for about 1 hr. and then cooled before introducing the specimen into the fatigue machine does not seem much higher than the endurance limit for specimens placed directly in a fatigue testing machine after overloading. A complete series designed to give the specimen a period of three months' rest have been laid down so as to study the effect of rest after overstrain.

Effect of Drawing After Quenching

Results of tests of specimens of carbon steel, given different "draws" after quenching, indicate that, in general, a "draw" up to about 600 deg. Fahr. increases the ductility of steel without appreciably lowering its endurance limit.

The result of tests on heat-treated steel is most readily shown by Fig. 3. A suggested explanation of this phenomenon is that drawing steel after it is quenched produces two opposing effects: the hardness and strength of individual grains of steel are somewhat decreased by drawing, but at the same time the internal stresses set up in the process of quenching are somewhat relieved. These two contradictory effects seem to balance each other quite closely up to a drawing temperature of about 600 deg. Fahr. for the carbon steels tested; for higher temperatures the weakening effect overbalances the stress-relieving effect, and the steel is weakened. These tests suggest the importance of a careful heat-treatment survey of any given steel as a guide for its effective use.

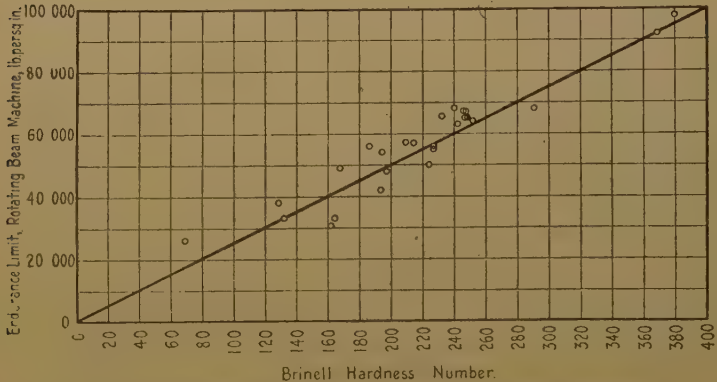


Fig. 8.—Correlation of Endurance Limit with Brinell Hardness

Figs. 4 to 9 inclusive show the relations found between the endurance limits for various steels and other physical properties. It will be noted that the results of the Charpy impact test do not seem to be correlated at all with the endurance limit; that the static ultimate or the Brinell hardness number seems to be a better index of strength under repeated stress than is the elastic limit, and that the rise-of-temperature test seems to indicate the endurance limit for wrought ferrous metals with a good degree of accuracy.

The foregoing discussion deals with reversed-stress; and an important problem is the relative destructive effect of cycles of completely reversed stress and of cycles of stress not completely reversed. In a general way test data indicate that a steel will withstand a maximum stress 50 per cent above the endurance limit for completely reversed stress if, in the cycles of stress, the range of stress is from zero to a maximum. For intermediate cases the limiting stress lies between the values given above. *In no case can steel be depended upon to withstand repeated stresses above the yield point.*

Effect of Speed of Reversal of Stress

The question of the effect of speed of reversal of stress on the result of repeated stress tests is of importance. Tests have been made with the Farmer rotating beam machine at speeds of 200 r.p.m., 1500 r.p.m. and 5000 r.p.m.; the results are given in Table 1. These results show that at a speed of 200 r.p.m. the endurance limit averages about 6 per cent lower when using a specimen of 0.25 in. in diameter than at the speed of 1500 r.p.m. and that for a speed of 5000 r.p.m. the endurance limit averages no higher than at 1500 r.p.m. These variations are not large and, while for any given comparison of materials it would seem wise to make tests at the same speed throughout, the effect of speed of reversal of stress on small specimens and machine parts does not seem to be very great. For larger machine parts where the path traversed by the stress would be longer, especially for larger shafts, there may be a question of the interference of waves of stress as they traverse the member. In connection with large machine parts subjected to repeated changes of load (a steam turbine rotor disk, for example), it may be necessary to make a study of the transmission and interference of waves of stress.

It seems worth while to attempt to picture the progress of a repeated-stress failure in a ferrous metal as it spreads throughout the crystalline structure. Under any conceivable condition of application of load to a machine part it seems probable that some crystals, subjected to heavy localized stress at bearing points unfavorably located for resisting stress, will develop minute cracks. The failure of these few crystals may not be the starting of a general failure of the member, but may constitute an adjustment of the internal structure of the member as cycles of stress are applied. If, however, the stress is above the endurance limit, these minute cracks spread. The roots of the cracks constitute points of localized stress and the damage spreads much as if minute hacksaws were cutting into the material. When the cracks have penetrated to some critical depth, failure suddenly occurs as in the case of a sharp-notched test specimen under static or impact load.

Table I—Effect of Speed on Endurance Limit of Steel Under Reversed Bending Stress

Steel	Endurance Limit, Lb. Per Sq. In. 200 Cycles of Stress Per Min.	1500 Cycles of Stress Per Min.	5000 Cycles of Stress Per Min.
1.20 per cent carbon, normalized	48,500	50,000	50,000
1.20 per cent carbon, quenched and drawn	100,000	102,000	.....
0.49 per cent carbon, quenched and drawn	45,000	48,000	.....
Ingot iron	24,200	26,000	26,300
Chrome-nickel, quenched and drawn	64,500	65,000	.....
3.5 per cent nickel, water quench at 1490 deg. Fahr., draw at 1100 deg. Fahr.	65,000	64,000	.....
Same steel, oil quench at 1450 deg. Fahr., draw at 1000 deg. Fahr.	78,000	79,000	.....
Same steel, annealed	52,000	54,000	.....

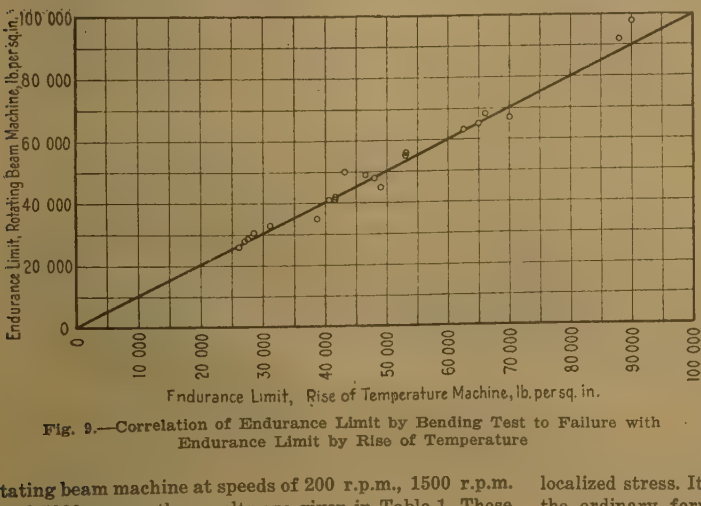


Fig. 9.—Correlation of Endurance Limit by Bending Test to Failure with Endurance Limit by Rise of Temperature

Under static or impact load.

This progressive failure under repeated stress seems to be a very different phenomenon from the ductile flowing of metal stressed beyond the yield point. Localized stresses and localized areas of weakness are far more dangerous under repeated stress than they are under stress applied only a few times.

Machine Design and Localized Stress

The machine designer of parts subjected to repeated stress must first of all recognize that the ordinary concepts and formulas of the mechanics of materials must be supplemented by a consideration of localized stress. It can scarcely be over-emphasized that the ordinary formulas of the mechanics of materials neglect many localized stresses; the formulas are not wrong, but for parts subjected to repeated stress they do not give a complete concept of the dangerous stress acting.

In a few cases the intensity of localized stress may be estimated quantitatively. For example the localized stress at a sharp shoulder is about double the stress computed by ordinary formulas; the localized stress at a shoulder with an ordinary fillet or at the root of the standard screw thread may be estimated at about 50 per cent above the stress computed by the ordinary formulas.

In many cases, however, the amount of localized stress cannot be estimated even approximately, and in such cases the designer must avoid sudden changes of form, sharp corners, sharp bearing edges, and any other causes of localized stress.

Localized stress must be considered for all members subjected to thousands of repetitions of stress, whether the stress involves a complete reversal or not. If, however, the stress (including the estimate of localized stress) is applied in cycles in which the stress does not pass through zero (the stress at the chord members of a long-span bridge, for example), then the allowable stress can usually be determined by the

static yield point of a material rather than by its endurance limit under repeated stress.

It would be very unfortunate if the designer entertains the idea that machine parts, subjected to repeated stress, cannot be safely and economically designed. They can be so designed, but it is, however, necessary to consider both the static stress (including the effect of occasional overload) and also the strength under repeated stress, including both the strength of the material and the localized stress set up in the machine part.

Alloy Castings from Electric Furnaces

Nickel, Chromium and Chrome-Nickel Steel Made on Pacific Coast—Their Production, Properties and Heat Treatment

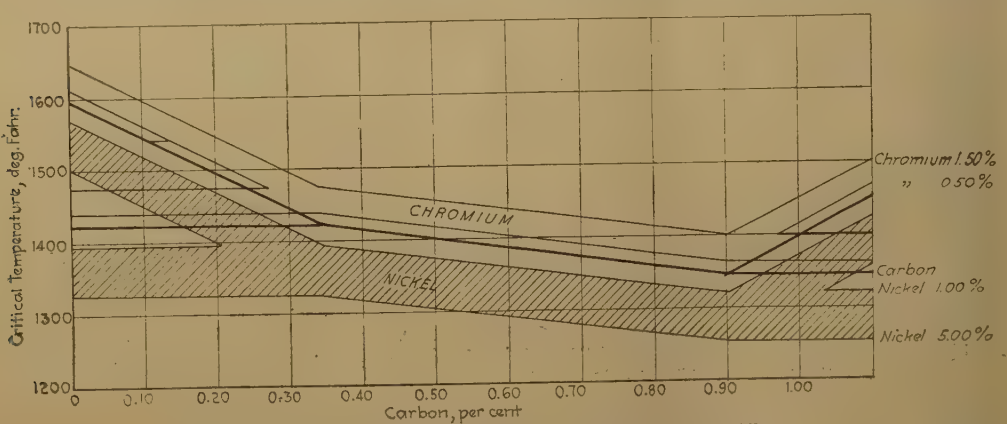
BY LARRY J. BARTON*

ONE of the newer lines of metallurgical endeavor is the manufacture of alloy steel castings to be heat-treated and used as a substitute for forgings, and for purposes where the ordinary grades of steel castings will not stand up under the duty imposed.

The first company on the Pacific coast to enter into this class of alloys is the Los Angeles Foundry Co., which is marketing its product under the name of Electro-Cast Products. There are many cases, in the oil field and mining work, where a superior product is desired, and quite often the shape is such as to make forging very difficult, if not impossible. For this work it has been found that a properly made and properly heat-treated alloy steel casting furnishes a material which will fit into the work desired with the greatest ease. Not only can certain conditions be met, but by changing the treatment the same metal can be used for several different purposes. This results in being able to send out to a mine several castings, all of the same chemical composition which, when treated according to the directions sent with them, will cover widely differing specifications.

There are many classes of work, formerly made of manganese steel, which are now made from other alloys. This is due to the fact that manganese steel cannot be machined, and if there are any small variations in the casting, it cannot be used unless put through the necessary grinding to alter it. Then, too, when the piece is scrapped, due to wear, it cannot be used for any other purpose. Alloy castings are made to overcome these points. They can be easily machined, can be made much harder than manganese steel and when scrapped can be used for other purposes.

After a great deal of experimentation and research covering a great many combinations of alloys it has been found that steels containing chromium, nickel and vanadium offered the most feasible and versatile products for the different classes of work covered. Some castings contain only nickel, some only chromium, some varying combinations of nickel and chromium, and some consist of different amounts of all three elements. Carbon contents are made suitable to the exact use of the casting.



Approximate Changes in Critical Temperatures as Caused by Alloys

The Melting Practice

All are cast from basic electric furnace, as are the company's other products, gray iron and "Duroloid," an alloy white iron for abrasive resisting work. The furnace is a standard 2-ton Greene type, lined to the slag line with magnesite, and similar in detail to any basic furnace. Steel scrap of varying composition is used for the charge which requires quite a large amount of chemical control work in order that specifications may be closely adhered to. Before the scrap is charged a light coating of lime is thrown on the hearth and the charge is melted down under a reducing atmosphere as far as possible in order that oxidizing conditions may be eliminated and alloys in the scrap saved. As soon as melted an analysis is run for the elements desired, usually carbon and manganese, although on certain heats nickel and chromium are also desired. While this sample is being analyzed the slag is brought up to a perfect carbide condition and the progress of the heat is checked by fracture tests. As soon as the

*Consulting metallurgical engineer, Los Angeles, Cal.

preliminary analysis is obtained the alloys are added and the heat is ready to tap. A skim gate is used and a tea-pot ladle for pouring.

Molding and Heat Treating

Great care must be used in the core making and molding for this class of work. Due to its heavy duty there must be no interior flaws such as small shrink cavities or blow holes, and as a result larger heads and different gating must be employed than would be used on ordinary steel casting work. This results in a smaller yield of cleaned castings from metal poured, but in a true quality product.

The heat-treating equipment is all standard, the ovens being both gas and oil connected. For quenching, standard oil and water baths are used. Some experimental work is being done with electrical heating but at the present time we have no results which are reliable or which have been tested over any length of time. All temperature checking is done by means of pyrometers and each class of steel has been accurately checked for critical points so it becomes an easy matter to keep the castings at the temperature desired. This is obtained by means of a central temperature station to which electrical leads come from each pyrometer. Each furnace has several different colored lights for the guidance of the operator. When the furnace is below the temperature desired, a light shows green; when correct, white; and when too high, red. This, together with recording meters, gives an excellent method of checking and supervising temperatures.

Nickel Steel Alloy Castings

Nickel has the same effect upon steel as carbon, although to a greater degree, that of lowering the transformation points. For the ordinary grades of nickel steel used in the above casting work, those of from 1.00 per cent nickel up to 4.00 per cent nickel, we find that 0.50 per cent nickel will lower the Ac_1 range about 10 deg. Fahr. and the Ar_1 on cooling about 20 deg. Fahr., from those of similar contents in plain steels. This is shown in the chart. The approximate

	Tensile Strength, Lb. per Sq. In.	Elastic Limit, Lb. per Sq. In.	Elongation, Per Cent	Reduction of Area, Per Cent
As cast	77,000	43,000	24.0	32.6
Annealed from 1500 deg., cooling in furnace	79,400	54,200	26.2	41.9
Air cooled using strong air blast from 1500 deg., drawing back to 900 deg.	82,000	57,000	27.8	44.6
Oil quenched from 1500 deg.	112,000	98,000	19.0	37.0

critical temperatures of these steels run from about 1325 to 1310 deg. Fahr. (Ac_1), 1250 to 1230 deg. Fahr. (Ar_1) for the 1.00 per cent nickel, to about 1250 to 1270 deg. Fahr. (Ac_1), 1100 to 1120 deg. Fehr. (Ar_1) for the 4.00 per cent nickel, depending on the differences in miscellaneous composition, carbon, manganese, etc. Nickel steels offer a distinct difference from plain carbon steels when heated above the critical points for any length of time, carbon steel tending to grow in grain size while nickel steels tend to become finer and closer in grain. This is an advantage in handling a large piece of work because the time of soaking may be prolonged and at the same time the grain refining becomes superior. This, of course, raises the cost of treating but in a strict quality product this is of secondary importance.

Treatment of Small Castings

On small size castings the general practice is to heat above the upper critical range, allow to soak until the heat is even throughout the piece of work being treated, withdraw from the furnace and either oil or water quench. These pieces are then drawn back to the temperature necessary to give the toughness required. On larger sized castings it is often necessary to give a double quench in order that the transformation may be complete, nickel having the tendency to retard this action.

A bearing casting was cast from metal analyzing carbon, 0.23 per cent; manganese, 0.75 per cent; silicon, 0.21 per cent; nickel, 1.53 per cent; phosphorus, 0.035 per cent, and sulphur 0.02 per cent. The first table gives a comparison of the different results which may be obtained by varying the treatments.

Some tests upon nickel steel averaging carbon, 0.25 to 0.30 per cent; manganese, 0.60 to 0.70 per cent; silicon, 0.20 to 0.25 per cent; nickel, 3.25 to 3.50 per cent; sulphur, 0.01 to 0.04 per cent, and phosphorus, 0.01 to 0.04 per cent follow:

	Tensile Strength, Lb. per Sq. In.	Elastic Limit, Lb. per Sq. In.	Elongation, Per Cent	Reduction of Area, Per Cent
As cast	85,000	46,000	20.0	48.0
Annealed from 1450 deg.	83,500	43,600	24.4	53.2
Quenched in water from 1400 deg., drawn back to 900 deg.	93,000	74,600	20.7	66.4
	102,640	81,100	19.8	71.7
Quenched in water from 1400 deg., drawn back to 550 deg.	137,000	113,800	13.4	53.8
	143,000	106,400	12.9	55.7

Brinell hardness numbers will range from about 175 on the annealed specimen to 400 on some of the harsher quenches.

Chromium Steel Alloy Castings

Chromium acts in a similar manner to nickel in changing the critical points of steels, but in the opposite direction, causing these temperatures to become slightly higher than those of plain steels of the same carbon contents. Chromium is exactly the opposite of nickel in regard to the effects of overheating for prolonged periods, rapidly deteriorating in strength and resistance to shock. For this reason a double quench gives superior qualities to these classes of steels. Chromium steels are capable of taking great hardness without a corresponding decrease of toughness, which makes them desirable for any such purpose as crusher jaws,, wearing plates and similar uses. As this hardness comes directly from the double carbide of iron and chromium the steel must be softened according to the amount of machining to be done. The general treatment on this class of steels is similar to that on nickel steels—quench from above the critical point, either draw back in air, or re-heat and re-quench at the lower temperature. Their properties are about as follows:

	Tensile Strength, Lb. per Sq. In.	Elastic Limit, Lb. per Sq. In.	Elongation, Per Cent	Reduction of Area, Per Cent
Analysis: Carbon, 0.60 to 0.70 per cent; chromium, 0.50 to 0.75 per cent. Quenched at 1500 deg., drawn back to 1300 deg.	79,000	64,500	34.4	66.6
Drawn back to 1050 deg.	100,600	94,300	20.1	60.0
Drawn back to 800 deg.	114,000	103,400	14.3	54.4

Nickel-Chromium Steel Alloy Castings

This class of steel probably represents the best general type of steel for heat-treated castings. The steel, when treated, shows the beneficial result of the toughness and ductility of the nickel together with the increased hardness and cohesion of the chromium. The best results are obtained by having a certain ratio of the two metals, usually about 2.50 per cent nickel to 1.00 per cent chromium. The general method of

treating is to quench in oil from a temperature higher than the critical point and draw back to the temper desired. For very high specifications a double quench is used. Quench from about 200 deg. Fahr. above the critical point, re-quench from just above the critical point, and then draw back. Their properties are about as tabulated above.

	Tensile Strength, Lb. per Sq. In.	Elastic Limit, Lb. per Sq. In.	Elongation, Per Cent	Reduction of Area, Per Cent
Analysis: Carbon, 0.30 to 0.40 per cent; chromium, 0.50 to 0.70 per cent; nickel, 1.30 to 1.70 per cent.				
Annealed from 1500 deg.	66,700	37,000	17.5	25.8
Annealed from 1350 deg.	65,000	32,600	30.1	54.3
Quenched from 1500 deg., drawn to 1000 deg.	90,000	65,000	23.9	61.6
Quenched from 1550 deg., drawn to 900 deg.	84,400	50,050	26.5	57.7

The above results go to show in a general manner what can be accomplished along these lines, but are by no means put forward as a text or as the absolute figures which can be obtained. There are many times where castings poured from the same heat and treated in the same manner will show widely differing results. We attempt to explain this by a difference in structure caused by such points as a different temperature when poured, different texture and temperature of the mold, etc., but, as we have no microscopical test laboratory, we are undecided at this time. These points will be proven later when we have absolutely determined, through wider use, the true value of the product as shown by its ability, not to fulfill tests or laboratory specifications, but in the test under actual working conditions.

Pearlitic and Sorbitic Manganese Steels

A Plea for Castings Containing About One Per Cent Manganese—Some of the Literature on the Subject—Their Heat Treatment and Properties

BY JOHN HOWE HALL*

THE adoption this year of tentative specifications for steel castings for railroads by the American Society for Testing Materials, in which the upper limit for manganese is set at 0.85 per cent, calls attention again to a most curious and persistent fallacy,—that steel is rendered brittle by a manganese content of 1.00 per cent or a little higher.

This idea appears to have originated in the early days of the industry when chemistry was fighting to obtain a foothold in the steel works. Failure of various heats of the Bessemer rail steels of those days was traced to an unusually high manganese content, and a dead line was set at 1 per cent. "Men *are* sheep, —bloomin' sheep," as Ortheris remarked, and since those old days but a very few steelmakers have ventured beyond that ancient dead line at 1.00 per cent manganese, and for some curious reason the experience of those who have penetrated into the forbidden territory has not attracted the attention it deserves.

To some extent, the same thing appears to hold true of phosphorus and sulphur; the upper limits for these elements were set many years ago, when the scope of metallurgical knowledge was limited indeed, and until very recent years no one has thought it worth while to re-examine carefully the premises upon which the allowable content of these impurities is based. The joint committee on phosphorus and sulphur in steel, now investigating this subject carefully and thoroughly, may in time be followed by a similar committee to determine the desirable content of manganese and silicon.

As a young man fresh from technical school, the writer became familiar with a steel, made on a regular production basis, analyzing from 0.30 to 0.50 per cent carbon, and from 1 to 1.50 per cent manganese or a little over, used quite largely for purposes where a combination of strength and toughness was essential.

From his notes, dated 1902, are taken the following analysis and tests of some of this steel, made in the Bessemer converter, which show its freedom from brittleness, to say the least:

Carbon, Per Cent	Manganese, Per Cent	Phosphorus, Per Cent	Sulphur, Per Cent	Silicon, Per Cent
0.24	1.62	0.06	0.019	0.25

	Tensile Strength, Lb. per Sq. In.	Elastic Limit, Lb. per Sq. In.	Elongation, Per Cent	Reduction of Area, Per Cent
Annealed bars	97,780	67,230	27.5	63.02
Annealed bars	99,420	68,990	27.5	63.65
Oil quenched and annealed	118,000	98,000	24.0	60.00

It may readily be imagined that the idea that steel containing over 1 per cent manganese is brittle was early dislodged from the writer's mind. The late Maunsel White had much to do with the development of this steel as a regular commercial product.

In 1908 and 1909, the late Dr. Henry M. Howe and the writer were called upon to produce a steel for castings, made in a 3-ton bottom blown Bessemer converter, that could be used satisfactorily for gold dredge buckets. These castings were subjected to extremely severe stresses in service, and to heavy wear, —so much so that to-day they are regularly made of 12 per cent (Hadfield) manganese steel. Experiment had demonstrated that plain cast steel of 0.20 to 0.30 per cent carbon was too soft and weak for the service demanded, and that harder steels almost invariably failed by breaking under the tremendous stresses occasionally set up in the line of buckets. Experiments with nickel and chromium did not promise a steel with sufficient strength and toughness and remembering the manganese steel mentioned above, we tried it for these castings, which in addition were to be water quenched and annealed, to give the highest possible strength and elastic limit for an extension of 25 per cent and a contraction of area of 40 per cent or better. Buckets of this steel, protected by plates of 12 per cent manganese steel at the points of greatest wear, stood up in service successfully, and held their own until displaced by the one-piece 12 per cent manganese steel bucket.

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From a book "Etude Industrielle des Alliages Metalliques" by F. Guillet, published in 1906, the following extracts are taken:

> Of the steels containing about 0.20 per cent carbon, those of the first class (from 1 to 5 per cent manganese) possess a tensile strength and an elastic limit which rises slowly with the manganese content, while the extension and contraction of area diminish slightly; *these steels show a very great resistance to shock.** This point is extremely important, and to show it clearly, we have broken more than 100 Fremont test pieces. The results obtained contradict absolutely the very widespread opinion among metallurgists that manganese makes steel brittle. We believe we have demonstrated clearly, on the contrary, that manganese makes steel brittle only when it is present in sufficient amount, or better, when the sum of the carbon and manganese is high enough, to lead to the production of martensite. As long as the structure is pearlitic, the steel, far from being brittle, is extremely homogeneous and *possesses a resistance to shock which one finds only exceptionally in carbon steels.**
>
> They (manganese steels) can, up to a certain point, be substituted for nickel steels, and that the more readily since for equal physical properties they are much less costly.
>
> Much less manganese than nickel, in fact, is required to produce a given effect, about 2.2 times less. . . . The pearlitic (manganese) steels can be used in the place of similar nickel steels; that they are not more used, is due, we repeat, to the false idea of the brittleness produced by manganese. . . . There is, however, one point that should be made, which is that manganese steels become brittle upon annealing more readily than nickel or carbon steels. For this reason, one should not think of using them for case-hardening. . . . To sum up, we can say that the manganese steels have not yet been sufficiently studied from the industrial point of view.

*Italics are the author's.

This steel was described by the writer in a paper, "Heat Treatment of Hypo-eutectoid Carbon Steel Castings," *Proceedings* A. S. T. M. 1913, Vol. XIII page 514, in a paper, "Shock Tests of Cast Steels," [THE IRON AGE, Oct. 23, 1913], *Proceedings* American Inst. Min. and Met. Engrs., Vol. XLVII (1913), page 482; in his book, "The Steel Foundry," (1914), in a paper by Nissen, Taylor and Hall, "The Heat Treatment of Cast Steel," *Proceedings* American Inst. Min. and Met. Engrs., Vol. LXII (1920), page 353 and elsewhere. A careful search of technical literature would no doubt result in scores of other references,—among others an article by F. C. Langenberg, "Impact Tests on Cast Steel," *Proceedings* A. S. T. M., Vol. XXI (1921), page 840, in which the great toughness of these steels under shock is especially noted.

In a paper by George Lang, in *Stahl und Eisen*, February, 1911, "The Influence of Manganese on the Physical Properties of Soft Steels," results are given that show that manganese up to even 1.77 per cent or higher confers great toughness on steel of 0.1 per cent carbon. The following results are of interest:

Physical Tests of Rolled Steels with Varying Manganese Content

No.	Manganese, Per Cent	Elastic Limit, Lb. per Sq. In.	Tensile Strength, Lb. per Sq. In.	Elongation, Per Cent	Reduction of Area, Per Cent	Shock	Hardness
1	0.29	46,000	62,600	27.85	53.5	23.2	119
2	0.44	47,600	65,000	29.2	62.5	29.4	115
3	0.68	49,700	66,200	29.4	63.9	28.1	115
4	0.79	49,200	64,500	27.85	65.9	33.4	118
5	1.02	51,600	68,000	28.65	64.2	31.3	123
6	1.27	54,300	71,300	27.9	63.1	26.4	132
7	1.32	54,000	71,200	28.0	67.7	34.0	133
8	1.77	57,900	82,500	25.9	54.7	25.1	156
9	1.34	58,400	85,000	26.0	46.75	23.6	162
10	2.23	61,000	92,600	21.2	43.4	9.5	198
11	2.47	63,400	103,000	18.8	39.4	2.7	211

Physical Tests of Steel Heated to 900 Deg. C. and Quenched, Having Varied Manganese Content

1	0.29	42,900	78,700	19.6	61.0	23.6	146
2	0.44	47,900	82,500	19.18	62.0	27.0	165
3	0.68	48,600	84,100	16.0	62.2	29.4	154
4	0.79	49,600	85,000	14.1	56.1	30.0	157
5	1.02	54,200	96,800	15.52	53.0	27.2	179
6	1.27	61,550	107,900	15.24	48.2	18.4	230
7	1.32	66,000	111,200	16.3	47.8	18.1	237
8	1.77	86,000	155,000	9.0	44.6	14.8	273
9	1.84	89,000	157,300	6.7	41.7	14.5	288
10	2.23	91,000	164,500	4.91	26.6	12.3	326
11	2.47	92,200	166,600	3.1	18.9	11.7	144

Another reference worth quoting is an article "An Alloy Steel of Special Composition," in the *Journal* of the American Society of Naval Engineers, abstracted in THE IRON AGE, Dec. 30, 1915, page 1553. In this article is described a steel of the following composition:

> Carbon, 0.30 to 0.35 per cent.
> Silicon, 0.25 to 0.35 per cent.
> Phosphorus and sulphur, below 0.05 per cent.
> Manganese, 1.00 to 1.20 per cent.
> Nickel, 1.50 to 1.80 per cent.
> Copper, 0.50 to 0.80 per cent.

which gave physical properties comparing favorably with those of 3 per cent nickel steel. Some of the test results appear in the table below.

From a letter of the late Dr. Henry M. Howe, written in 1909, the following is quoted:

> The line N.P. (plotting elastic limit against extension) represents the upper limit of steel forgings of unusually high quality which I gathered many years ago, . . . you will see from this that our coupons (of 0.25 per cent C., 1.25 per cent Mn. cast steel, quenched and annealed) are better than the best published forgings at the time I made the compilation. I have in my notes 255 sets of published results of steel castings which I have taken the trouble to compare with these results. Out of these 255, only three cases come up to the line N.P. (representing high quality forgings) and these three are not so good as the average of our coupons by a good deal. It thus seems that we are making the best castings of which we have any knowledge.

From a paper by the late Dr. Henry M. Howe, "Manganese in Steel Making," *Proceedings* A. S. T. M.,

Physical Tests from Coupons Cast on Body of Castings

Heat	Carbon, Per Cent	Sulphur, Per Cent	Manganese, Per Cent	Silicon, Per Cent	Phosphorus, Per Cent	Nickel, Per Cent	Copper, Per Cent	Tensile Strength, Lb. per Sq. In.	Yield Point, Lb. per Sq. In.	Elongation, Per Cent	Reduction of Area, Per Cent	Bend, Degrees
201	0.36	0.036	0.81	0.31	0.034	1.60	0.76	92,283	55,767	22	37	120
204	0.30	0.037	0.93	0.36	0.04	1.44	0.85	92,334	55,003	21	31	120
207	0.33	0.030	1.02	0.38	0.035	1.15	0.49	88,616	54,494	25	40	120
208	0.34	0.034	1.04	0.36	0.033	1.14	0.52	92,691	56,277	22	34	120
214	0.35	0.035	1.11	0.33	0.042	1.34	0.60	95,543	59,078	22	37	120
215	0.30	0.032	0.93	0.35	0.043	1.12	0.77	90,042	57,550	23	37	120
216	0.27	0.04	1.18	0.35	0.046	1.60	0.61	92,691	55,003	22	36	120
218	0.34	0.042	1.15	0.35	0.035	1.58	0.69	94,330	54,748	22	36	120
219	0.27	0.035	1.02	0.30	0.047	1.47	0.42	85,510	56,022	23	34	120
223	0.38	0.029	1.02	0.35	0.049	1.10	0.80	88,718	55,512	23	38	120
228	0.30	0.031	1.15	0.38	0.046	1.60	0.56	96,510	59,587	23	37	120
230	0.36	0.036	1.18	0.31	0.049	1.37	0.80	94,117	50,929	23	36	120
232	0.36	0.036	1.03	0.35	0.039	1.47	0.68	90,144	55,225	23	34	120
233	0.36	0.035	1.02	0.40	0.04	1.78	0.21	96,052	59,087	25	41	120
234	0.32	0.036	1.21	0.36	0.049	1.24	0.65	91,366	55,003	25	44	120
236	0.31	0.033	1.15	0.34	0.043	1.54	0.70	81,343	60,096	25	41	120
241	0.31	0.033	0.96	0.39	0.042	1.27	0.64	87,343	53,457	23	36	120
245	0.31	0.033	1.15	0.37	0.037	1.30	0.62	92,181	55,288	23	36	120
248	0.33	0.032	0.79	0.42	0.048	1.69	0.65	87,191	54,239	23	38	120

vol. XVII (1917), page 5, abstracted in THE IRON AGE, for Aug. 2, 1917, page 239, the following is taken:

> Turning now to carbon steel, the retarding effect of manganese on the structural changes shows itself by leading in general to finer structure, to finer ferrite masses, finer network structure and finer pearlite, indeed probably often to the replacement of lamellar pearlite with sorbite. This greater fineness leads to better quality in general, and to a higher elastic limit in particular, though of course with a corresponding sacrifice of ductility. The great value of manganese for this purpose has not begun to receive the attention it deserves. It is probable that a manganese content of, say, 1.25 per cent, with a correspondingly lessened carbon content, may be used so as to lessen the danger of cracking and the residual stresses, when a high elastic limit is sought, because this large manganese content in and by itself raises the elastic limit by giving a fineness of structure which otherwise would be sought by increased violence of cooling, or by the use of a lower drawing temperature. In other words, the use of 1.25 per cent manganese lessens the needed violence of cooling, and permits the use of a higher residual drawing temperature, in both ways tending to mitigate the stresses, and in the former way lessening the chances of cracking.

As we have already stated, these are but a few of many references which might be quoted on this interesting subject, but all tell the same story—that manganese in excess of 1.00 per cent is a benefit, not a detriment, at least to low carbon steels.

The writer has referred before to the successful application of a similar steel in car coupler knuckles by one of the large manufacturers, is aware of the use of these steels for motor shafting subject to severe service, and with the employment of a steel of about 0.50 per cent carbon, with 1.00 per cent manganese in cylinders for oxygen, hydrogen, and other gases, an application where steel of great strength combined with great toughness, is an absolute essential. And yet, the advocates of the proposed upper limit of 0.85 per cent manganese in steel castings for railroads, mentioned at the beginning of this paper, stated that of course for his own protection, the producer of the castings would not think of exceeding that limit. Truly, a metallurgical fallacy has as many lives as a cat,—yet even a cat cannot live forever.

Influence of Mass in Heat Treatment

Rôle of Special Elements, Nickel, Chromium and Molybdenum, in Counteracting Effect of Size—Experimental Data on Sections 0.5 to 3 In. in Diameter

BY E. J. JANITZKY*

THE most important factor affecting constitutional changes in hardening pearlitic steels is the velocity of cooling.

According to the prevalent view, it is possible only in extraordinary cases to retain the phase at which the steel was at the quenching temperature and then only in the presence of special hardening elements. Of the special elements used for this purpose in structural pearlitic alloy steels, three are considered in this article: nickel, chromium and molybdenum. The latter element is used only in combination with the two former.

However, the beneficial properties obtained by the use of the special elements and their combinations are again counterbalanced by an increase of the mass of the object to be quenched, but to a remarkably lesser degree than in plain carbon steels.

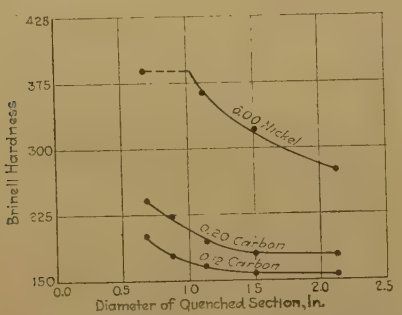

Chart 1.—Case-Hardening Steels. Their heat treatment and composition are as follows:

	6.00 Per Cent Nickel 1580 deg. Fahr.— H_2O 1380 deg. Fahr.— H_2O	0.20 Per Cent Carbon 1650 deg. Fahr.— H_2O 1400 deg. Fahr.— H_2O	0.12 Per Cent Carbon 1650 deg. Fahr.— H_2O 1400 deg. Fahr.— H_2O
C	0.17	0.20	0.12
Mn	0.34	0.99	0.71
P	0.014	0.066	0.080
S	0.014	0.049	0.048
Si	0.39	0.11	0.05
Ni	6.00	....	....

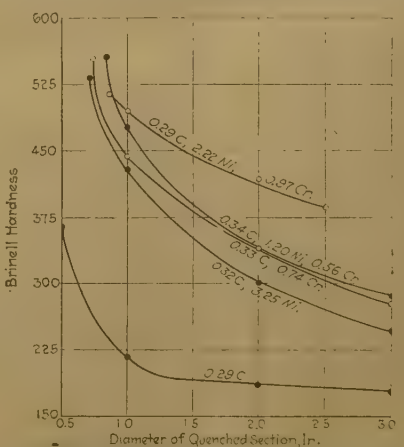

Chart 2.—Effect of Nickel and Chromium on the Influence of Mass in Heat Treatment in a Carbon Range of 0.29 to 0.34 Per Cent. Heat treatment and composition are as follows:

	High Nickel-Chrome 1510 deg. Fahr.— H_2O	Low Chrome-Nickel 1535 deg. Fahr.— H_2O	Chrome 1600 deg. Fahr.— H_2O	Nickel 1450 deg. Fahr.— H_2O	Plain Carbon 1600 deg. Fahr.— H_2O
C	0.29	0.34	0.33	0.32	0.29
Mn	0.37	0.50	0.56	0.56	0.37
Ni	2.22	1.20	....	3.25	....
Cr	0.97	0.56	0.74	....	....

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The merits of the special elements and their combinations on the physical properties (static, dynamic and others) are not considered here, as they do not come within the scope of this article. Data in this re-

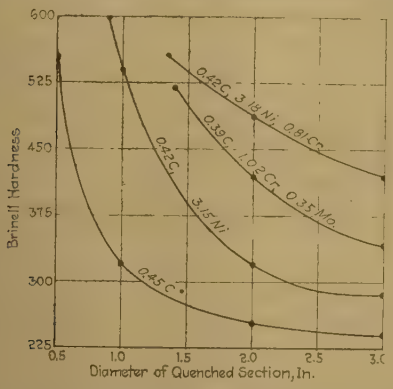


Chart 3.—Effect of Nickel, Chrome-Nickel and Chrome-Molybdenum on the Influence of Mass in Heat Treatment in a Carbon Range of 0.39 to 0.45 Per Cent. Heat treatment and composition are as follows:

	High Nickel-Chrome 1450 deg. Fahr.—H_2O	Chrome-Molybdenum 1525 deg. Fahr.—H_2O	Nickel 1450 deg. Fahr.—H_2O	Plain Carbon 1600 deg. Fahr.—H_2O
C.....	0.42	0.39	0.42	0.45
Mn.....	0.30	0.53	0.61	0.78
Ni.....	3.18	....	3.15	....
Cr.....	0.81	1.02	....	....
Mo.....	....	0.35	....	....

gard can be found in abundance in metallurgical literature.

The writer has compiled data of cross-sectional central Brinell hardness tests of sections 0.5 in. to 3 in. in diameter and plotted these values against the corresponding diameters, it being felt that curves are more illustrative and convincing than tabulated figures. The maximum section, 3 in. in diameter, was selected because this size approaches the maximum used in crankshafts in the automotive industry.

The Brinell hardness test was chosen as it gives a general measurement of hardness gained by quenching and also bears a close relation to the ultimate strength. This relation is approximately 500 in the foot-pound system and holds good for all grades of carbon steel, whether heat-treated or in the natural state. A slight modification of the factor 500 gives fair approximate values for structural alloy steels. Furthermore, the Brinell hardness test is the most rapid and efficient one at the present time, as it avoids the expense and difficulties of machining hardened and non-tempered steel. A fracture of a circumferencially nicked round, or any other section, of quenched steel can be easily obtained and, after being ground, a study of the hardness gradient can be made.

The requirement for steel furnished by the steel manufacturer is uniform chemistry. Hence one expects that heat treating shall produce, after tempering, uniformity in cross-sectional hardness as, in drawing, the hardness gradient is first equalized before uniform tempering of the object begins.

A general idea, not accepted as a rule however, is that the difference in ultimate strength between test specimens taken circumferencially and centrally should not vary more than 7000 to 14,000 lb. per sq. in. after tempering in a 3-in. round. It is therefore obvious that on account of this relation between ultimate

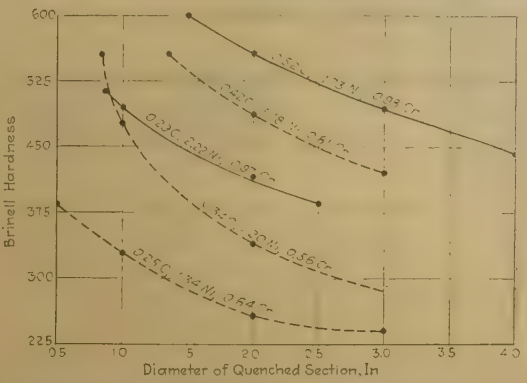


Chart 4.—Effect of Mass in the Heat Treatment of Nickel-Chrome Steels of Different Chemical Compositions. Their heat treatment and composition are as follows:

	Medium Nickel-Chrome 1470 deg. Fahr.—H_2O	High Nickel-Chrome 1450 deg. Fahr.—H_2O	High Nickel-Chrome 1510 deg. Fahr.—H_2O	Low Chrome-Nickel 1535 deg. Fahr.—H_2O	Low Chrome-Nickel 1600 deg. Fahr.—H_2O
C.....	0.52	0.42	0.29	0.34	0.25
Mn.....	0.39	0.30	0.37	0.50	0.64
Ni.....	1.73	3.18	2.22	1.20	1.34
Cr.....	0.98	0.81	0.97	0.56	0.54

strength and Brinell hardness as previously mentioned, the latter test cannot be excelled by any other in studying this question.

The four charts illustrating the influence of alloying elements in increasing sections represent 14 steels

Table of Actual Brinell Hardness Numerals from Which Curves Were Plotted

Steel Uses, Per Cent	Chart No.	Maximum Brinell	Breaking Diameter, In.	0.5 In.	0.6875 In.	0.0875 In.	1 In.	1.125 In.	1.5 In.	2 In.	2.125 In.	2.5 In.	3 In.	4 In.
0.12 C.	1	...	...	...	201	179	...	167	159	...	156	...	...	...
0.20 C.	1	...	...	...	241	223	...	196	183	...	179	...	...	...
0.17 C, 6.00 Ni.	1	388	1.04	...	388	...	...	363	321	...	277	...	...	...
0.29 C.	2	364	0.5	364	...	...	217	...	...	187	...	...	179	...
0.45 C.	3	555	0.5	555	...	...	321	...	...	255	...	...	241	...
0.32 C, 3.25 Ni.	2	532	0.73	532	...	...	430	...	...	302	...	...	248	...
0.42 C, 3.15 Ni.	3	600	0.896	600	...	...	540	...	...	321	...	...	286	...
0.33 C, 0.74 Cr.	2	555	0.74	555	...	...	444	...	...	340	...	...	277	...
0.25 C, 1.34 Ni, 0.54 Cr.	4	386	0.265	386	...	...	330	...	...	258	...	...	242	...
0.34 C, 1.20 Ni, 0.56 Cr.	2 and 4	555	0.836	555	...	...	477	...	...	340	...	...	286	...
0.29 C, 2.22 Ni, 0.97 Cr.	2 and 4	512	0.875	512	...	...	495	...	...	418	...	387	...	...
0.42 C, 3.18 Ni, 0.81 Cr.	3 and 4	555	1.35	555	...	...	546	...	...	487	...	...	420	...
0.52 C, 1.73 Ni, 0.98 Cr.	4	600	1.485	600	...	...	600	...	...	555	...	...	495	444
0.39 C, 1.02 Cr, 0.35 Mo.	3	520	1.38	520	...	...	496	...	...	418	...	...	342	...

of different chemical composition, divided into four groups:

Chart 1.—Casehardening group; two plain carbon steels, and one 6 per cent nickel steel.

Chart 2.—One plain carbon steel, one nickel, one high chrome-nickel and one low chrome-nickel steel. The carbon range of the five steels is from 0.29 to 0.34 per cent.

Chart 3.—One plain carbon steel, one nickel, one chrome-molybdenum and one high chrome-nickel steel. The carbon range of the four steels is from 0.39 to 0.45 per cent.

Chart 4.—This chart comprises five chrome-nickel steels, of which one is an air-hardening chrome-nickel steel, two are low chrome-nickel steels of respectively 0.25 and 0.34 per cent carbon content, and two high chrome-nickel steels of respectively 0.29 and 0.42 per cent carbon content.

The charts are self-explanatory, chemical analysis and heat treatment being given with each. The table is a key to the Brinell numbers, giving accurate readings.

The maximum hardness obtained is that at a point where for a smaller section the Brinell hardness does not increase, that is, the curve runs parallel to the X axis. Any section in this range should be considered as practically thoroughly penetrated. In fact in the smaller gages we would undoubtedly run into the austenitic condition. However, these smaller sizes have no practical application.

It is not out of place to mention that the curves were all checked by the author's hardness—mass formula and follow closely that hyperbolic curve. In all cases the quenching was done in water. Values for oil quenching or tempering or extension to larger sections can be obtained by following the method which the writer outlined in a paper, published in THE IRON AGE, March 9, 1922.

As to the origin of the 14 tests dealt with, all data are the writer's own, with the exception of the case-hardening group and the 0.45 per cent plain carbon steel, both of which were taken from Report No. 75 of the British Engineering Standards Association.

Concluding, the writer wishes to point out that in comparing Charts 2 and 3, it is evident that the maximum hardness obtainable is nearly constant, whereas the lesser decrease of the hardness gradient is remarkable in alloy steels of increasing mass as compared with the standard plain carbon steels.

It is hoped that in time more data of this kind will be available for all alloy structural steels so that one will be able to judge intelligently their merits as to sensitiveness to mass action.

PRICES STILL HIGH

Indications at Youngstown Are of Stabilization at Present Levels

YOUNGSTOWN, Sept. 26.—Basic pig iron is still pegged at $34. Steel makers point out that higher costs of iron, labor and scrap metals have contributed materially to advanced steel costs, necessitating higher price levels. Dealers are asking $22 to $22.50 for heavy melting scrap, up fully $8 from prices prevailing four months ago. At $34 pig iron is up $16 from the low of $18 in the spring, which remained the nominal quotation for some time. While coal at $4.50 to $4.75 for coking grades represents a decline from $9 and $10, coke is still high at $11 to $12 Connellsville, and is another contributing factor in high costs.

Though the major properties in this territory largely supply their own requirements of by-product coke, it is necessary for several to buy additional tonnages of coke in the merchant market. Other stacks, such as that of the A. M. Byers Co. and the Struthers Furnace Co., depend wholly on merchant coke production for their supplies.

Decrease in Buying

Steel makers, therefore, say that current quotations are fully justified by advanced costs, but admit there has been a reflex action in buying. In some important lines, consumers show less urgency for supplies. Higher prices have already adversely affected export sales, and are beginning to show effect on the domestic market. Demand in general, however, in this country, is being bolstered by the fact that production was materially interrupted during July and August because of coal shortage at industrial plants.

Indications point to stabilization of prices at prevailing levels over the fourth quarter, affecting sheets, wire products and strip steel. Sheets are readily obtainable at 3.50c. for black and 4.50c. for galvanized, base gages. Resumption of Ford plants did not materially affect the sheet mill situation in the Mahoning Valley, because of the brief period of the suspension. There had been little or no let down in shipments of sheets or strip to the Ford factories from this territory. Just prior to the actual closing of the Detroit factories, the Ford company had ordered 1200 tons of sheets released from a Valley producer. The Detroit auto maker has been absorbing regularly about 1500 tons each week from a Valley interest.

Full finished sheets are in strongest demand of any grades at present, due to maintenance of high production schedules by important auto and body builders taking quotas regularly from the Valley. The price of No. 22 gage auto body stock has firmed to 5c. for the final quarter.

Sheet Bar Prices

In sheet bars, $40 is the governing price on fourth quarter shipments, contracts with non-integrated rollers being adjusted on this basis. It represents a horizontal advance of $5 over the third quarter price. One important Valley semi-finished maker is negotiating contracts at this price for the quarter, but another is still adhering to a 30 days' selling policy.

Tin plate business is experiencing seasonal inactivity, and ten mills of the leading independent maker here have been idle for several weeks. While an advance to $5 per base box is talked of, it is considered likely that producers would be willing to enter tonnage at $4.75, and possibly less where regular customers taking large quotas are involved.

The bulk of the strip steel produced by the three mills of one Valley interest is moving to the Ford plants. Makers have a comfortable volume of unfilled tonnage and the market appears firm at 2.75c. minimum for hot-rolled and 4.25c. for cold finishes. Premiums are being offered for delivery considerations, ranging from $2 to $3 per ton.

One recent purchase of heavy melting scrap by a Valley melter involved 8000 tons, for delivery over the rest of the year, at a reported price around $21.

Industrial Progress Continued in August

Advance figures of the Department of Commerce in connection with the Survey of Current Business show no significant recession in business activity in August, in spite of the trouble caused by coal and railroad strikes. The marked decline in the production of iron and steel was attributed to fuel shortage, but the increasing unfilled orders of the United States Steel Corporation indicated no apparent letup in the demand for steel products.

On the other hand there was increased activity in textiles, the mill consumption of both cotton and silk being the largest for any month in the past two years. The building industry showed the usual seasonal slump but the production of building materials continued at the high level of July. Assurance of good crops has been seen in increased sales of farm equipments and larger business by mail order houses. Freight car loadings showed a marked increase over the preceding month and were far greater than a year ago.

Growth of American Alloy Steel Industry

Statistics Since 1909—Record in Alloy Steel Castings —Output from Electric Furnaces—Rôle of Heat Treatment

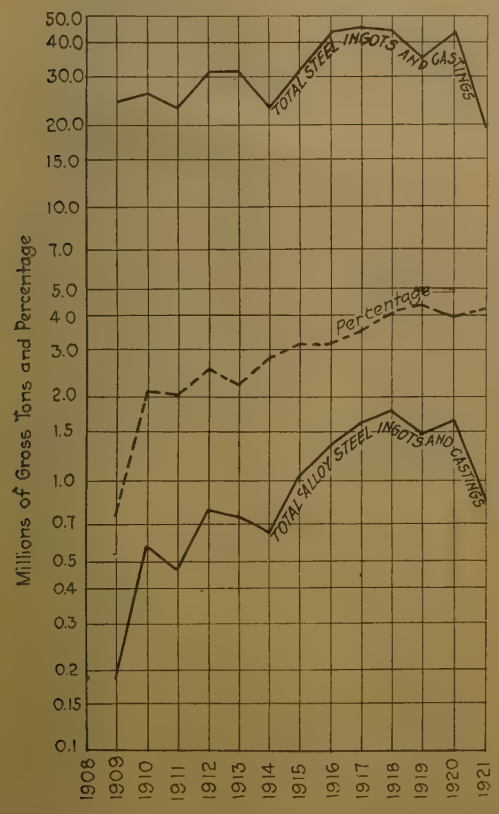
BY EDWIN F. CONE

YEAR by year, since their early introduction, alloy steels have advanced in importance, until to-day they play an indispensable role in industry. Prior to 1909 the production of anything but simple carbon steel ingots or castings in the United States was so small that very little attention was paid to them in the publication of the annual statistics of the American industry. Some high-speed steels were made earlier, but the amount was not large, expressed in tons.

Based on an analysis of the data of the American Iron and Steel Institute, and of other organizations this article presents a review of the progress of the American alloy steel industry in general. There is also discussed the alloy steel casting industry and then the progress made in the production, year by year, of electric alloy steels as a whole, and electric alloy steel castings.

Alloy Steel Industry as a Whole

Gradual but steady has been the increase in the proportion of alloy steels made in the United States in each of the 13 years, 1909 to 1921 inclusive. In actual figures from official data the course of this development is shown by Table 1 and graphically by the accompanying chart.



How the Proportion of Alloy Steel to the Total Steel Produced Has Been Gradually Increasing. The use of the ratio chart makes the rates of fluctuation truly comparable

Table 1.—Production of Steel Ingots and Castings and of Alloy Steel Ingots and Castings in the United States

	Total Steel, Gross Tons	Alloy Steel, Gross Tons	Alloy Steel of the Total, Per Cent
1909	23,955,021	181,980	0.75
1910	26,094,919	567,819	2.17
1911	23,676,106	481,459	2.03
1912	31,251,303	792,501	2.53
1913	31,300,874	714,357	2.28
1914	23,513,030	646,953	2.75
1915	32,151,036	1,021,147	3.17
1916	42,773,680	1,362,615	3.18
1917	45,060,607	1,644,335	3.65
1918	44,462,432	1,787,852	4.02
1919	34,671,232	1,481,188	4.27
1920	42,132,934	1,660,292	3.94
1921	19,743,797	809,548	4.10

In the infancy of the American alloy steel industry in 1909, only 0.75 per cent of the total steel output was alloy steel. By 1913 this had increased three-fold to 2.28 per cent. The peak was attained in 1919 at 4.27 per cent, but for the last four years, 1918 to 1921, the change has been slight.

The striking fact, however, is that, despite wide fluctuations in the country's total steel output, the alloy industry has really made larger gains than is apparent. Of special interest is the maintenance of a production of 4.10 per cent of the total in 1921, the year of the most severe depression since 1908.

Viewed from another angle, a still further comparison of interest is possible. As late as 1909 the rate of production of total steel to alloy steel was over 130 to 1, or there were about 130 tons of steel ingots and castings made for every one ton of alloy steel. Starting with 1909, this proportion for later years has been as follows:

1909	131.6	tons to 1 ton of alloy steel
1910	45.9	
1911	49.1	
1912	39.4	
1913	43.8	
1914	36.3	
1915	31.4	
1916	31.3	
1917	27.4	
1918	24.8	
1919	23.4	
1920	25.3	
1921	24.3	

According to these figures, the alloy steel industry first attained large proportions in 1910, when one ton of alloy steel was made to every 46 tons of total steel. Since then, with slight variations, the relative increase of the two industries has changed decidedly until this ratio dropped last year to 24 to 1.

The Alloy Steel Casting Industry

The extent to which alloy steels have been incorporated in castings presents an interesting phase of this analysis. Taking from the same statistics the total alloy steel and the total alloy steel as castings over the same period of years, the course of the development is shown by Table 2.

Here an unusual comparison between present and pre-war tendencies exists. Up to 1915, inclusive, with the exception of 1910, a much larger tonnage and percentage of alloy castings was made than for every year since. And since 1916 to the present time there

has been a much smaller proportion made as castings. For the six years (omitting 1910) prior to 1916, the percentage of alloy steel castings of the total alloy steel averaged 11.69 per cent, while from 1916 to 1921, inclusive, this average was 4.01 per cent per year. Here, again, in 1921, despite the depression, there were

Table 2.—Production of Total Alloy Steel and of Alloy Steel Castings in the United States

	Total Alloy Steel, Gross Tons	Total Alloy Castings, Gross Tons	Percentage of Castings of Total
1909	181,980	23,002	12.64
1910	567,819	29,357	5.17
1911	481,459	56,290	11.69
1912	792,501	103,109	13.01
1913	714,357	88,927	12.44
1914	646,953	69,846	10.79
1915	1,021,147	97,896	9.58
1916	1,362,615	56,458	4.14
1917	1,644,335	67,529	4.10
1918	1,787,852	66,485	3.71
1919	1,481,188	45,372	3.06
1920	1,660,292	68,353	4.11
1921	809,548	40,255	4.97

more alloy steel castings made in proportion to the total alloy steel, or 4.97 per cent, than in any of the previous five years.

It is difficult to explain this large difference. In the few years just prior to 1915 a very large quantity of cast steel frames for locomotives was made containing vanadium. Many of the railroads ordered these partly as an experiment and partly as regular equipment. This, of course, ran the total of alloy castings into large figures as each frame is very heavy. While this practice by the railroads still continues, it possibly does not represent as large a tonnage as formerly. This may account in part for the difference referred to. The more reasonable conclusion, however, is that the increased use of alloy steels has been in rolled and forged material, which has consequently cut down the proportion of castings of the total.

Electric Alloy Steels

Turning to the electric furnace phase of the alloy steel industry, some interesting observations are possible. Comparing the total alloy steel production of the country with alloy steel made in electric furnaces, a marked increase in the latter is evident from the data in Table 3.

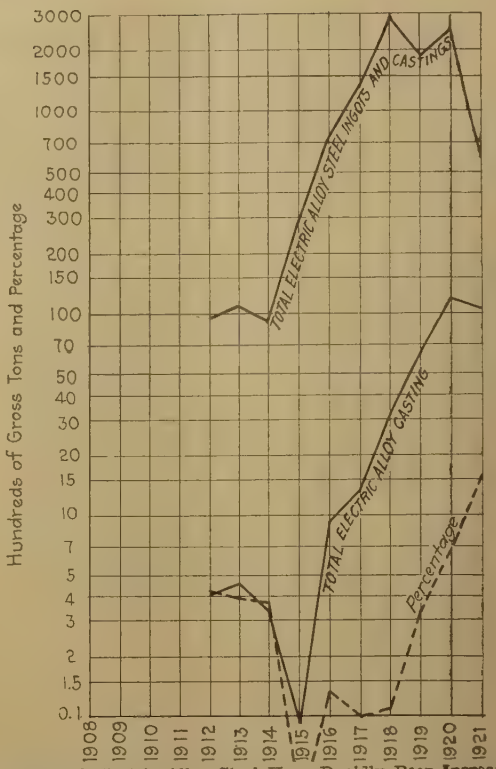
Table 3.—Production of Total Alloy Steel and of Alloy Steel in Electric Furnaces in the United States

	Total Alloy Steel, Gross Tons	Electric Alloy Steel, Gross Tons	Electric Alloy Steel of Total Alloy Steel, Per Cent
1909	181,982	.....	....
1910	567,819	608	0.10
1911	481,459	.....	....
1912	792,501	9,619	1.21
1913	714,357	11,264	1.57
1914	646,953	9,344	1.44
1915	1,021,147	27,944	2.73
1916	1,362,615	71,129	5.22
1917	1,644,335	130,578	7.94
1918	1,787,852	290,961	16.26
1919	1,435,816	181,632	12.63
1920	1,660,292	245,572	14.78
1921	809,548	63,246	7.81

Not until 1912 did the electric steel industry of this country attain any real importance. Since then the expansion in alloy steel made in electric furnaces has been rapid. The point of particular significance is that even during the war, except perhaps in 1918, the expansion was not as great as in 1919, 1920 and 1921. That the electric steel alloy production in 1921 should have been 7.81 per cent of the total in such a period of depression, or larger than in the war years of 1915, 1916 and 1917, is a notable fact, which only such an analysis as this brings out.

Large Output of Electric Alloy Castings

But the most remarkable development in the whole American alloy steel industry is the rapid growth re-



Castings of Electric Alloy Steel Have Rapidly Been Increasing in Tonnage and in the Percentage of All Alloy Steel Made in Electric Furnaces

cently in the production of alloy steel castings in electric furnaces. Table 4 and the chart reveal this.

Table 4.—Production of Total Alloy Steel and of Alloy Steel Castings from Electric Furnaces in the United States

	Total Electric Alloy Steel, Gross Tons	Electric Alloy Castings, Gross Tons	Electric Alloy Castings of Total Alloy Steel, Per Cent
1909	.....	.....	....
1910	608	8	1.18
1911	.....	.....	....
1912	9,619	402	4.18
1913	11,264	443	3.93
1914	9,344	340	3.64
1915	27,944	96	0.34
1916	71,129	926	1.30
1917	130,578	1,296	0.99
1918	290,961	3,076	1.05
1919	181,362	6,057	3.33
1920	245,572	11,710	6.50
1921	63,246	10,084	15.94

During the war the proportion of alloy steel castings from electric furnaces fell to percentages lower than in the infancy of the industry in 1910, and considerably lower than in 1912, 1913 and 1914. Since 1918 the expansion in this field has been striking, rising from 3.33 per cent in 1919 to 6.50 per cent in 1920 and culminating in the remarkable proportion of 15.94 per cent in 1921.

A satisfactory explanation of this is difficult. There was a decline in 1921 of 182,326 tons, or 75 per cent, in the total electric alloy steel production of the country, but in the output of electric alloy castings there was a decline of only 1626 tons, or 14 per cent. And this took place again in a year of acute depression in the whole steel industry.

In judging the usual development two tendencies in the electric steel industry are to be noted. One is the growing use of electric alloy steel castings, properly heat-treated, as a substitute for regular forgings. The other is the still more recent tendency in the making of manganese steel castings by the elec-

tric process rather than by the small converter. Several plants for the latter industry have been established or changed over to electric furnace equipment for the production of high manganese steel castings.

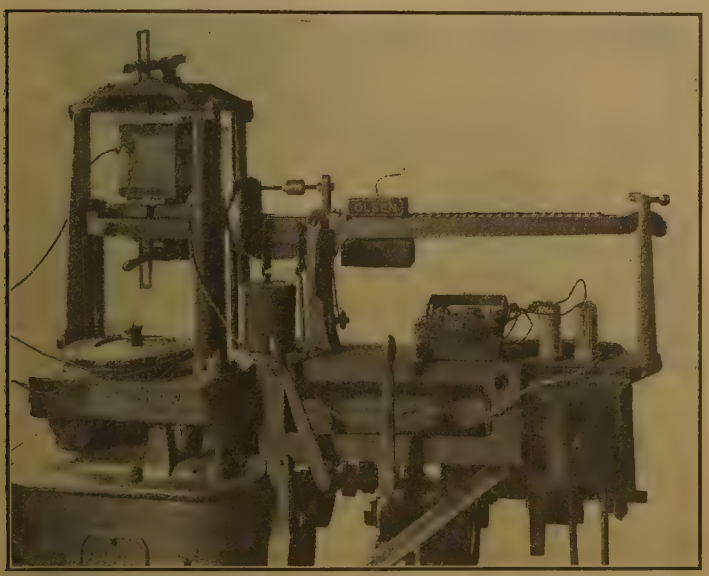
Most interesting would be information as to the distribution of the various kinds of alloy steel—how much of each kind, into what products they go, etc. In quantity production probably the nickel, chromium, nickel-chromium, chrome-vanadium and, of course, the regular high manganese steels, predominate. In the forging field, the first four of these, together with molybdenum steels are the leaders. The production of automobiles, which first reached large proportions in the five or six years following 1910, was the main cause of the development of alloy steels. Since then their use has broadened until they are a factor in locomotive construction, agricultural implements, mining machinery, rolls for rolling mills, die blocks, aircraft equipment, with the list constantly broadening. High-speed steels are, of course, prominent among alloy steels.

Electric Furnaces and Heat Treatment

Two modern developments have made the alloy steel industry possible. Their importance cannot be exaggerated. The first is the electric furnace. Its introduction made possible the production of most of the ferroalloys without which the large variety of alloy steels could not well be made. The second is the broadening of the art of heat treatment into a science and the production of equipment suitable for its use. Most alloy steels are of little value until after they have been heat treated, and upon their heat treatment depends the degree of their superiority. No more convincing proof of the growth of the alloy steel industry can be pointed to than the expansion of the American Society for Steel Treating from a beginning only four years ago to one of the largest technical organizations in the country. It celebrates its fourth anniversary by a large convention and steel exhibition in Detroit next week.

A New Phase and the Future

Mention should be made of a new phase of the alloy industry which is coming rapidly to the front. It should be included in any resumé of the alloy steel industry. It is the production of alloy iron castings. While only beginnings are thus far recorded in this field, these are of vital importance and full of large industrial possibilities. Ten years from now, or perhaps less, they are likely to take their place alongside of alloy steel castings in output and application. A review of these industries a few years from now will undoubtedly tell a story more interesting than the foregoing. Alloy steels may be revealed as practically revolutionizing the design and construction of equipment in use to-day, making possible devices hitherto not thought probable.



Tensile Tests of Cast Iron at Various Temperatures

Results of Work Done on Annealed Bars in a Special Apparatus—Comparison with Steel Under Similar Conditions

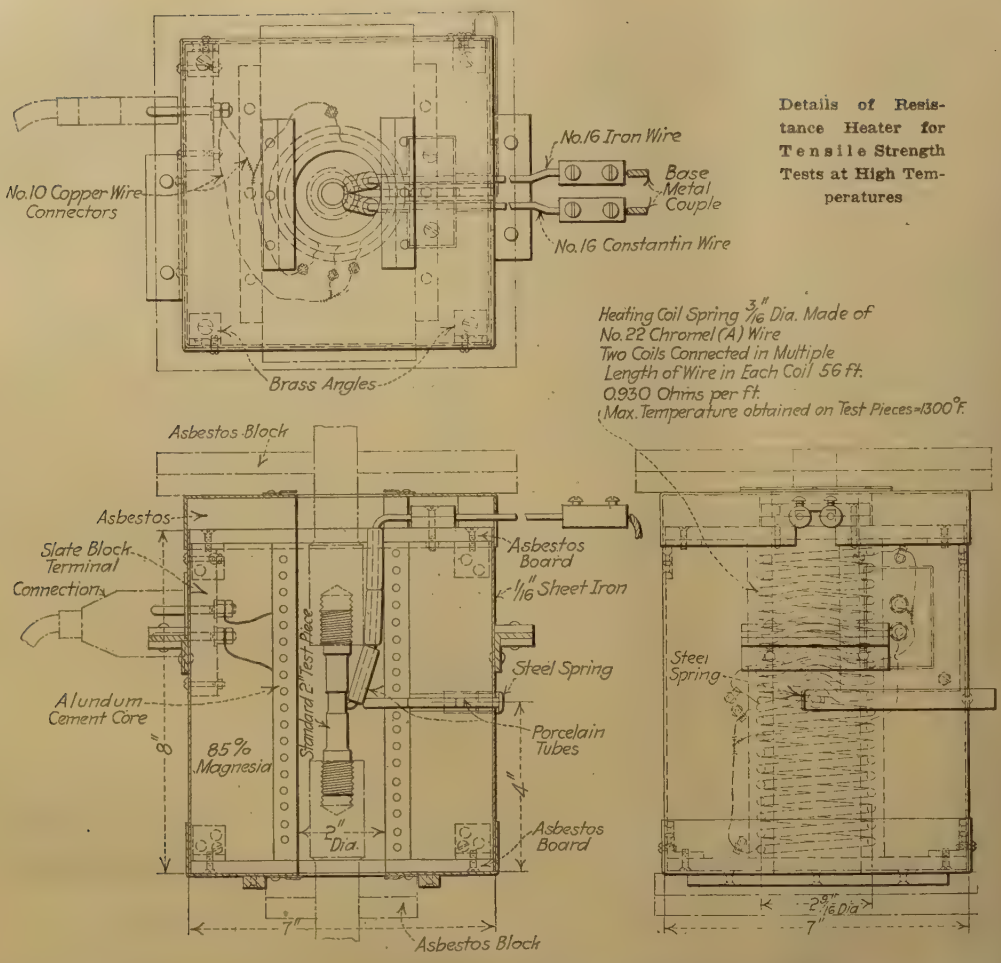
BY J. F. HARPER
AND
R. S. MAC PHERRAN*

THE question of the tensile strength of cast iron at various temperatures having been raised by the engineers of the Allis-Chalmers Mfg. Co. the following tests were made to establish a curve showing the general effect of an increase of temperature on the tensile strength of gray cast iron. This was a continuation of similar work on various grades of steel which was given in a paper, "Comparative Tests of Steel at High Temperatures" read before the June convention of American Society for Testing Materials 1921 and reported in THE IRON AGE, June 30, 1921.

The heating box used was 7 in. sq. by 9 in. high. The hole in which the test specimen was inserted was 2 in. in diameter and was lined with a core of alundum cement wound with No. 22 gage chromel wire. This wire was wound in two coils, one over the top and one over the lower half of the alundum core. They were connected in multiple. The coils were then covered with alundum cement and the box filled with magnesia as in Fig. 1.

The couple entered at the top of the box and ran down to such a position that the point was opposite the center of the test specimen. A spring on the outside of the box forced a porcelain rod through a hole and against the base metal couple, holding the point of this against the test specimen. The temperatures were taken by a Leeds and Northrup pyrometer, using a base metal couple. The specimens used had threaded ends and were machined to 0.564 in.

*Metallurgists, Allis-Chalmers Mfg. Co., Milwaukee, Wis.



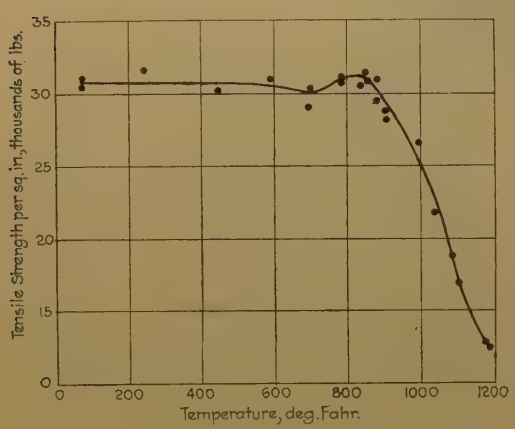
Details of Resistance Heater for Tensile Strength Tests at High Temperatures

in diameter for a clear space of ½ in. in the center of bar. All tests were held at constant temperature for 15 to 30 min. before pulling.

The test bars were all cast in green sand molds and from a single 2000-lb. ladle of cast iron. They were then annealed at a temperature of 1100 deg. Fahr. for one hour and allowed to cool slowly, in order to relieve all casting strains and to equalize cooling conditions. Preliminary tests showed a great variation in the tensile strength of bars not so treated.

The number of bars broken between 775 and 910 deg. Fahr. should be noted as this is the range in which the curve begins to drop.

In the results above referred to the tensile strength of steels was found to drop sharply around 800 deg. Fahr. We are not as yet able to give the comparative result of fatigue tests at high temperature, but it is evident that for static loads cast iron maintains its strength slightly better than steels at high temperatures.



Tensile Strength of Cast Iron at Various Temperatures. Analysis of the iron: Silicon, 1.840; sulphur, 0.106; phosphorus, 0.520, and manganese. 0.640 per cent

Cast Iron Tested Under Temperature, Annealed at 1100 Deg. Fahr.

Temperature, Deg. Fahr.	Tensile Strength, Lb. per Sq. In.
70	30,400
70	31,100
241	31,700
445	30,300
589	31,000
695	29,200
700	30,320
781	30,800
786	31,120
838	30,700
849	31,400
857	30,800
875	30,900
881	29,560
902	28,480
904	28,800
991	26,680
1,041	21,920
1,088	18,400
1,101	17,040
1,176	12,880
1,182	12,560

Steel Treaters' Week at Detroit

Annual Convention and Exhibition of the American Society for Steel Treating, Oct. 2 to 7— Drop Forgers Unite

THREE years ago in Chicago, in September, 1919, the first convention of technical men interested in the heat treatment of steel was held under the name of the American Steel Treaters Society. By a bold stroke, the same group of men also launched a successful exhibition of steel-treating equipment.

Since that auspicious beginning the rapid expansion of the society is a well-known fact. Next week in Detroit the national organization, now known as the American Society for Steel Treating, which resulted from the combination of the new society and the older one located at Detroit, will hold the largest convention and exhibition in its history. More than that, the week's activities include participation also by the American Drop Forging Institute, which unites with the steel treaters by holding its technical sessions at the same time and place and also joins in the exhibition, so that the latter is this year called the International Steel Exposition. This year's affair, which is to be held in the General Motors Building, is expected to eclipse easily the Chicago, Philadelphia and Indianapolis conventions and exhibitions, held in 1919, 1920 and 1921 respectively.

An interesting technical program has been prepared. A new feature is the pre-printing of most of the papers. There are also fewer papers than at previous meetings. Some of the subjects covered by the sessions are: Carbonizing, Tool Steel, General Heat-Treating Problems and Research. There are also to be two symposiums, one on hardness testing and another on metallurgical education.

The session to be held by the drop forgers is scheduled for Oct. 3.

This issue of THE IRON AGE presents its first six articles as special contributions to the subject of heat treatment in general.

Great Variety of Products Will Be Shown by Exhibitors

A

AJAX MFG. CO., Cleveland. A new model twin-geared, upsetting and forging machine embodying many improved features; a model of the company's motor-driven, direct-geared, connecting board, drop hammer; a display of sample forgings all made by Ajax machine methods. Represented by J. R. Blakeslee, president; R. A. Bannerman, Cleveland; W. W. Criley, Cleveland; H. D. Heman, Cleveland; A. L. Guilford, Chicago; J. A. Murray, New York.

ALLIED METAL PRODUCTS CORPORATION, Detroit. Nickel Alloys, Heat resisting—non-corrosive, in sheets, bars and castings and finished products. Represented by V. Hybinette and W. J. Moore.

AMERICAN BLOWER CO., Detroit. Man cooling fan—operates as a very large desk fan directing a cooling breeze over

workmen employed before furnaces or other hot machines; Pressure blower for furnishing blast for furnaces; utility blower for blowing scale from forging dies. Represented by G. C. Polk, manager, standard apparatus division; J. Dill, manager, Detroit sales office; O. F. Polk, manager, standard apparatus division; W. A. Rane, chief engineer.

AMERICAN CAR & FOUNDRY CO., New York. No. 3 three-electrode rivet heater. Represented by J. M. Hayes.

AMERICAN CYANAMID CO., New York. Commercial packages of its new case hardening and heat treating compounds which are produced from cyanide made from air nitrogen at Niagara Falls. Represented by A. G. Bachman and O. D. Grier.

AMERICAN DROP FORGING INSTITUTE, Cleveland. Typical forgings supplied from the products of the executive members of the Institute. Represented by R. E. Waldron, Dominion Forge & Stamping Co., Walkerville, Ont.

AMERICAN KREUGER & TOOL CORPORATION, New York. Specimens of new hardening process, "Nitrol," for steel and iron; also metallurgical equipment. Represented by F. H. Holden.

AMERICAN REFRACTORIES CO., Pittsburgh. American silica brick coke oven shapes and gas retort shapes; ground ganister, silica fireclay; "AA" Austrian magnesite brick, dead burned magnesite and magnesite cement; American chrome brick and chrome cement; also samples of "Arcofrax," "Arco" fireclay, and American fireclay. Represented by A. F. Greaves-Walker, manager of production, and M. R. Stowell.

AMERICAN TWIST DRILL & TOOL CO., Detroit. High speed drills, cutters, saws and reamers. Represented by L. C. Gorham, F. E. Henderson, Stanley Sowder.

ARMSTRONG-BLUM MFG. CO., Chicago. Marvel metal band saw in operation, cutting die blocks and doing tool room work; Marvel automatic high speed hack saw, running continuously, cutting off bar steel automatically; marvel draw-cut hack saw, showing new design with motor attached as a portable outfit for operation from any lighting circuit; Marvel all-steel punch, shear and bender. Represented by Harry J. Blum, secretary, and George J. Blum, vice-president.

ARMSTRONG CORK & INSULATION CO., Pittsburgh. "Nonpareil" insulating brick for furnaces, ovens, boiler settings, kilns, etc.; "Nonpareil" high pressure covering, blocks and cement for steam lines and other heat equipment; "Nonpareil" corkboard for cold storage rooms, "Nonpareil" cork covering for brine; ammonia and other refrigerated lines and "Linotile" and Armstrong's cork tile floors. Also an electrically heated furnace demonstrating the heat retarding qualities of "Nonpareil" brick. Represented by W. C. Rasche and E. D. Summers, Detroit; S. L. Barnes and H. B. Gates, Pittsburgh.

ATLAS STEEL CORPORATION, Dunkirk and Charleroi, Pa. Full line of tool and high speed steels; also samples and fractures of same in various metallurgical conditions; full line of special steels, such as magnet, valve, non-corrosive and ball-bearing steels. Represented by W. C. Peterson, M. Grossman, Frank Lounsbury, William H. Wills.

B

BAUSCH & LOMB OPTICAL CO., Rochester, N. Y. Complete line of metallurgical microscopes and metallographic equipment, ranging from simplest types, suitable for general foundry use, to most complete equipments for research laboratory work. New contour measuring projector, by means of which contour of screw threads, gear-cutting tools and small machine parts may be accurately and rapidly checked. This equipment, it is claimed will be the means of definitely settling the question of distortion due to heat treatment. Equipment will be in actual operation. Represented by W. L. Patterson and I. L. Nixon.

BELLEVUE INDUSTRIAL FURNACE CO., Detroit. A sectional view of the company's high speed furnace showing the inner construction; also same size furnace in actual operation. Represented by P. P. Barker, W. E. Hinz, L. J. Raymo, Chris. Voelker and Erich Hinz.

BETHLEHEM STEEL CO., Bethlehem, Pa. Mayari pig iron for motor castings; also Bethlehem rolled steel truck wheels for motor trucks and Bethlehem special high speed tool steel. Represented by Robert MacDonald, H. P. Kreulen, W. C. Cutler, W. H. Laury, T. J. Fitzgibbons, F. A. Wallen and W. R. Shimer.

ALFRED O. BLAICH CO., Detroit. Carbonizing materials; "Quick Case" for cyaniding purposes; "Quick Heat" for heat treating purposes; "Insulite" for selective hardening, "Leadcoat" for covering lead baths. Represented by Frederick Pugh, J. A. Howland and S. W. Baldwin.

BRISTOL COMPANY, Waterbury, Conn. A complete line of temperature recording instruments and pyrometers covering a range of from 30 deg. below zero to 3,000 deg. Fahr., together with temperature control apparatus. The Bristol-Fuller valve used in connection with temperature controller for gas, oil and steam is a new feature. Represented by C. C. Eagle, Jr., district manager at Philadelphia.

BROWN INSTRUMENT COMPANY, Philadelphia. Brown improved automatic temperature control and balanced valve for gas, oil, air and electricity. The balanced control instruments in actual operation; Brown indicating and recording pyrometers; automatic cold end compensation and how this feature is applied to both Brown indicators and records shown by glass-covered instruments; Brown indicating and recording thermometers for oil-quenching baths and for all low temperature work up to 1000 deg. Fahr.; Brown indicating and recording pressure gages, tachometers, resistance thermometers and complete line of Brown instruments used throughout the industrial field. Represented by G. W. Keller, sales manager; J. J. Mungan, Detroit district manager; E. R. Robinson, Detroit; R. W. Mayer, D. J. Jones, W. H. Negley, T. W. Barker.

BRITISH AMERICAN NICKEL CORPORATED, LTD. Nickel in ingot; Cathode and shot form. Represented by Mr. L. J. Buck.

BUREAU OF STANDARDS, DEPARTMENT OF COMMERCE, Washington. A recording chronograph for direct plotting of inverse rate heating and cooling curves, recently constructed at the Bureau, shown in operation. The production of pure metals such as iron and the preparation of gas free alloys, together with the melting of different industrial ferrous and non-ferrous metals by various methods illustrated. In connection with this work, methods developed for determination of gases in metals will be shown. Hot and cold working of metals, their heat treatment and testing including some applications of the 2,300,000 lb. emery testing machine will be shown; also results of recent studies of the properties of ferrous and non-ferrous metals at high temperatures and a model car wheel, showing a method of study of the distribution of stresses under conditions approximating those of service; a set of gages finished by the Hoke method and typical standard samples prepared by the Bureau will be at hand. Represented by H. J. French, J. S. Vanick, T. G. Digges, Miss D. E. Kingsbury and Dr. G. K. Burgess.

C

CALORIZING CO., Pittsburgh. Calite castings for various uses in high temperatures. These applications will be for temperatures up to about 2200 deg. Fahr. and will include case hardening and annealing boxes, lead pots, parts of continuous heat treating furnaces, rollers in continuous annealing furnaces, skids for enameling furnaces; also calorized steel tubes for recuperators. Some calorizing also shown for pyrometer protection tubes, gas and oil burners. Represented by Brooke L. Jarrett, president; A. V. Farr, vice-president; E. L. Malone, Eastern district representative, and Fred D. Rice, Pittsburgh representative.

CARBORUNDUM CO., Niagara Falls, N. Y. Standard high speed heat treating furnace equipped with "Carbofrax" hearth and lining, in operation; radiating combustion chamber unit composed of "Carbofrax"; collection of "Carbofrax" hearth tile, supports, baffles, etc., for high speed heat treating furnaces; standard "Carbofrax" plain tile and standard brick; "Carbofrax" and "Firefrax" cements; "Carborundum" fire sand for furnace linings; "Carbofrax" pyrometer tubes; "Carborundum" and "Aloxite" wheels and other abrasives. Represented by C. E. Hawke, sales manager, refractory division, New Jersey; R. M. Onan, refractory division, Chicago; E. W. Jones, refractory division, Cleveland, and Anthony Dobson, district sales manager, Detroit.

CASE HARDENING SERVICE CO., Cleveland. Samples of "Bohnite" for pack hardening and "Caseite" for cyanide hardening; also samples of work produced by representative manufacturers using the company's products. Represented by E. J. Gossett, C. E. Lovejoy, W. C. Bell, C. E. Pullum, J. L. Stroman and William H. Bell.

CELITE PRODUCTS CO., Chicago. Exhibiting a furnace, one wall of which is built of ordinary fire brick and the other wall of "Sil-O-Cel" insulating brick; a complete line of "Sil-O-Cel" heat insulation products including "Sil-O-Cel" brick, block, powder and cement; "Celite" high temperature cements and "Celcote" for waterproofing; also samples of "Filter-Cel" for better filtration and "Celite" mineral filler. Represented by A. B. Rogers, Detroit, assisted by L. M. Lindsey, Cincinnati, and C. L. Burnham, Chicago.

CENTRAL STEEL COMPANY, Massillon, Ohio. Alloy steels and various finished products made from alloy steels; high-finish automobile sheets; strip steel, hot rolled alloy steel and hot rolled carbon steel; physical charts, microphotographs. Represented by F. J. Griffiths, vice-president and general manager; J. M. Schlendorf, director of sales; Gilbert Canterbury, manager sales promotion; Earl Smith, chief metallurgical engineer; C. P. Richter, metallurgical engineer; Arthur Schaeffer, manager Detroit sales office.

CHICAGO FLEXIBLE SHAFT CO., Chicago. Double deck furnaces for high speed and carbon steel; a small oven furnace for annealing; carburizing, etc., and crucible furnace for lead or cyanide hardening, salt baths, etc.; also oil tempering furnace for drawing temper of tools, dies, etc., where color is not wanted. Represented by Peter Blackwood, manager of furnace department, and George P. Beck, manager of Detroit office.

CLIMAX MOLYBDENUM CO., New York. Following companies which are producing and advertising molybdenum steel products will be represented: Wood Shovel & Tool Co.—H. K. Wood's "Mo-lib-den-um" Shovel; A. Finkle & Sons, "Mo-lyb-die" steel; Parish Mfg. Co., Parish "Mo-lyb-den-um" frames; Wheeling Mold & Foundry Co., "Mo-lyb-den-um" roll; Cleveland Motorcycle Co., "Mo-lyb-den-um" motorcycle; Cox Brass Co., "Mo-lyb-den-um" bumper; Ohio Seamless Tube Co., "Mo-lyb-den-um" seamless tubing; Lancaster Steel Products Co., cold drawn "Mo-lyb-den-um" steel bars; Wills Sainte Claire, "Mo-lyb-den-um" Car; Driver-Harris Co., and Pioneer Alloy Products Co., makers of heat and acid resisting alloys; King Pneumatic Tool Co., "Mo-lyb-den-um" riveting hammer. Represented by B. F. Phillipson, J. D. Cutter, W. N. Bratton and C. H. Batchelow.

COLONIAL STEEL CO., Pittsburgh. Materials used in the manufacture of Colonial tool steels. Represented by J. Trautman, Jr., assistant general sales manager; Dr. N. B. Hoffman, metallurgist; G. W. Hampshire, manager Detroit branch; Colin McInnes, special representative; James E. Barry, special representative; C. O. Sternagle, manager Chicago branch; Lawrence Wood, manager Pittsburgh sales; J. M. Smith, special representative; F. L. Stevenson, manager Cleveland branch; Charles Kopenhoefer, special representative.

COMBUSTION UTILITIES CORPORATION, New York. Lead and oil tempering bath; muffle furnace rivet forge; recuperator sections; drawings for recuperative and regenerative furnaces; wooden models of recuperative forge furnace and recuperative heat treating furnace. Represented by

G. L. Ballard, Beloit, Wis.; P. J. Nutting and H. M. Henry, Toledo, Ohio.

CRUCIBLE STEEL CO. OF AMERICA, New York. Different classes of high speed steel for both cold and hot work; all grades of plain carbon tool steels, as well as alloy tool steels for every purpose; these to include both water hardening and oil hardening varieties; non-changeable tool steels, stainless steels and flame and rust resisting steel; also a variety of finished tools. Represented by Dr. John A. Mathews, president; R. Michener, general sales agent; Dr. C. M. Johnson, director of research department; A. L. Ralston, sales manager at Detroit; J. W. Taylor, manager of service department.

D

DEARBORN CHEMICAL CO., Chicago. No. OX-ID rust preventive; cleaners, liquid and powdered; cutting oils, quenching oils. Represented by E. M. Converse, Chicago; O. L. Flengel, Detroit and C. I. Loudenback, Detroit.

DRIVER-HARRIS CO., Harrison, N. J. Cast nichrome in the form of carbonizing containers, pyrometer protection tubes, furnace muffles, burning racks, etc. Represented by W. E. Blythe and H. O. Hartdegen.

E

ELECTRIC FURNACE CO., Salem, Ohio. Display of products showing range of materials which are being heat treated in company's electric furnace equipment; these will range from axles, crank shafts and anchor chain down to bolts, ball races and small steel parts. Represented by T. F. Baily, vice-president; R. F. Benzinger, sales manager; F. J. Peterson, Detroit representative; M. T. Ellis, salesman and R. F. Fletcher, advertising manager.

ELECTRO-ALLOYS STEEL CO., Youngstown, Ohio. Samples of tools and tool steels with special reference to exhibits of the fractures of different types of tool steels in different conditions of hardness. Represented by A. L. Garford, president; W. C. Whyte, special representative; E. C. White, Michigan representative; R. A. Miller, sales department, and Heman Ely, Jr., sales manager.

CHARLES ENGLEHARD, INC., New York. A complete display of various types of pyrometer indicating and recording instruments, including single-record and multiple-record recorders, featuring a frictionless moving system which is used in all of these instruments and by which delicate pivots are eliminated. The construction of the galvanometer is such that there is absolutely no friction. Thermo-couples: four different kinds of base metal thermo-couples and two different kinds of rare metal thermo-couples, including protecting tubes, both primary and secondary, and miscellaneous fittings will be shown. Tests showing the ability of Impervite (porcelain) pyrometer tubes to stand temperature shock, and their impermeability to gases at high temperatures will be demonstrated. The feature of the exhibit will be automatic temperature regulators in actual operation on both electric and gas-fired furnaces. A new instrument to record transformation points, both for laboratory and industrial use, in operation. A complete exhibit of "Impervite" porcelain ware for metallurgical and chemical purposes will be shown. Represented by E. S. Newcomb, J. H. Oetjen and H. L. Shippy.

F

A. FINKL & SONS CO., Chicago. Miscellaneous drop forgings up to 350 lb., and smaller; "Molyb-Die" steel piston rods with physical and microscopic tests of same; three grades of "Molyb-Die" steel, die blocks; namely F. S. in the treated state; F. X. hardened; "Durodi," annealed with physical and microscopic tests of same. Represented by Charles E. Finkl, Fred Finkl, William Finkl, T. P. Wallace, Frank J. Hunt and A. R. Lane.

FIRTH-STERLING STEEL CO., McKeesport, Pa. "Blue Chip" high speed steel; Firth-Sterling special tool and die steel. Represented by Edwin T. Jackman in charge; G. A. Jacobs, W. C. Royce, W. A. Nungester, I. Olsen, T. A. Larecy.

J. B. FORD CO., Wyandotte, Mich. Wyandotte metal cleaner. A model cleaning tank will be in operation showing practical tank construction and the advantages of the use of Wyandotte metal cleaner in modern production practice. Represented by B. N. Goodell, manager industrial department; J. S. Kelly, C. S. Tompkins, G. J. Lawrence, Paul Bombenek.

G

WILLIAM GANSCHOW CO., Chicago. Type A. B. & C. speed transformers; direct connected—type A; right angle drive—type B; vertical drive, type C.; automobile transmission gears; spiral bevel drive and differential gears; noiseless bakelite timing and rawhide gears for the commercial trade; spur gears from 1 in. outside dia. to 12 ft. dia., 20 in. face; also bevel and mitre gears. Represented by F. J. Niedermiller, Detroit representative.

GENERAL ALLOYS CO., Chicago. Q-alloys; wireless bulletins—all apparatus in booth. Represented by H. H. Harris and A. L. Grinnell.

GENERAL ELECTRIC CO., Schenectady, N. Y. Semi-cylindrical furnace, muffle furnace, air tempering oven, box type furnace and oil tempering bath. Represented by C. L. Ipsen and C. T. McLoughlin.

GODDARD & GODDARD CO., Detroit. Line of special "Go and Go" milling cutters as adapted for various lines of milling, special attention being paid to cutters for railroad work, automobile work and general purpose milling. Represented by A. N. Goddard, president; C. S. Goddard, sales manager; R. T. Rice, Ohio representative.

GENERAL STEEL CO., Massillon, Ohio. Finished and semi-finished products used in the automotive industry and a great many other industries and produced from various kinds of alloy steels will be the main feature. Examples will also be shown of difficult stampings made from the company's high finished sheet steel and its hot rolled strip steel. The exhibit will endeavor to give some visualization to the development of the general use of alloy steels in industries outside the automotive field. Represented by F. J. Griffiths, vice-president and general manager; J. M. Schlendorf, director of sales; Gilbert Canterbury, manager of sales promotion; Earl Smith, chief metallurgical engineer; C. P. Richter, metallurgical engineer; Arthur Schaeffer, Detroit district sales manager.

H

GEORGE J. HAGAN CO., Pittsburgh. Complete drawings, photographs and operating data concerning the majority of the company's electric furnace installations. Represented by R. E. Talley, C. F. Cone and A. D. Dauch.

HALCOMB STEEL CO., Syracuse, N. Y. A complete line of tool and alloy steels. Represented by Messrs. Stagg, Spalding, Schroeder, Atkinson, Disque and Baker.

HAYNES STELLITE CO., New York. All styles and sizes of "Stellite" welded tools; assorted line of "Stellite" milling cutters; a line of cloth and rubber cutting knives; various special castings, such as several types of dies, valves, shafts, etc. A device known as a hot billet scraping machine will be displayed. Represented by A. B. Leonard, W. S. Tromley, C. C. Pendrell and H. S. Bunn.

HEPPENSTALL FORGE & KNIFE CO., Pittsburgh. Hammer ram, machined complete; hammer guides, rough machined; solid head piston rod, rough machined; annealed die block in the condition in which they are shipped; treated die block as they are shipped; "Hardtem" die block; "Hardtem" die block cut in half and polished to show the effects of heat treatment; shear knife for shearing rounds such as are used in a drop forge shop; shear knife for shearing shapes.

HOLCROFT & CO., Detroit. Photographs and drawings of electric furnaces pertaining to the heat treatment of both ferrous and non-ferrous metals; also of melting equipment for both ferrous and non-ferrous metals; a renewable electric unit. Represented by C. T. Holcroft, president; R. T. Cadwell, secretary and treasurer, C. L. Joy, chief engineer; H. L. Ritts, sales manager; and Oscar E. Erisman, St. Louis representative.

HOSKINS MFG. CO., Detroit. Furnace and automatic control outfit employing a cast heating unit. Represented by A. S. Lee, J. W. Moore, J. D. Sterling, R. P. Ellis, W. A. Gatward and C. S. Kinnison.

HAUCK MFG. CO., Brooklyn. The new Hauck "Venturi" oil burners for open hearth and heat treating furnaces, pressure and siphon types, besides regular line of torches, portable burners and rivet heating forges. Represented by Herbert Vogelsang and A. F. Schumann.

E. F. HOUGHTON & CO., Philadelphia. Houghton's carburizing materials, rust preventives, leather packings and quenching and tempering oils. Represented by J. E. Burns, Indianapolis; H. E. Cressman, Detroit; C. A. Gesell, Cincinnati; H. G. Lloyd, Milwaukee; G. S. Rogers, St. Louis; A. J. Jennings, Kalamazoo; J. W. Kelley, Cleveland; W. A. Beuchner, Pittsburgh; G. W. Pressell, general sales manager.

I

INTERNATIONAL NICKEL CO., New York. Nickel products such as blocks, shot, electro and malleable nickel; nickel and monel metal in the automotive field; nickel steels in the automotive field. Represented by A. J. Wadhams, G. A. Wotherspoon, T. H. Wickender, C. McKnight and P. D. Merica.

INTERSTATE IRON & STEEL CO., Chicago. Moving pictures taken at the company's South Chicago plant, showing complete process of manufacture of alloy steels and exhibit of important parts of various makes of pleasure cars in which Interstate alloy steels are used. Represented by W. J. MacKenzie, Paul Llewellyn, R. S. LeBarre and E. Larned, Chicago representatives; F. Walter Guibert and H. L. Couzens, Detroit.

K

KELLER MECHANICAL ENGRAVING CO., Brooklyn. A new type "F" Keller automatic die sinking machine embodying revolutionary features; entirely electrically driven; push button controls for every movement; also several dies cut on company's machine. Represented by S. A. Keller, president; Jules Dierck, vice-president and sales manager; Charles Bitter and A. J. Benson.

KEYSTONE REFRACTORIES CO., New York. Dura-Stix, the high temperature cement; "Crundumsand," a dense high refractory granular material. These articles are used as refractories for furnace economy. Represented by F. W. Reisman, president; L. E. Turk, treasurer; G. M. Sherman, New England sales manager; H. A. O'Brien, S. W. Cole, representatives.

CHARLES KLEIST & SON, Jamestown, N. Y. Drop hammer boards for board drop forge hammers; (a) built-up hammer board (new principle); (b) cut-in hammer boards; (c) standard hammer boards. Represented by H. E. Kleist.

L

LEEDS & NORTHRUP CO., Philadelphia. "Potentiometer" pyrometers, both indicating and recording types; complete automatic temperature control equipment; an equipment for heat-treating steel according to the Hump method, which will be in full operation, actually hardening tools. Represented by G. W. Tall, Jr.; A. E. Tarr, E. B. Estabrook and O. Brewer.

E. LEITZ, INC., New York. Leitz "Micro-Metallograph" in conjunction with the new vibration absorber; also general metallurgical microscope equipments with a full line of "Apochromatic" objectives and new "Periplan" oculars; grinding and polishing machines for the preparation of microscopical specimens. Represented by G. Spindler and G. Sauppé.

M

MIDVALE STEEL & ORDNANCE CO., CAMBRIA STEEL CO., Philadelphia. Reception booth. Represented by Stuart Hazlewood, manager forging division; H. E. Rowe, in charge of tool steels; George A. Richardson, in charge of advertising, exhibits, etc., and representatives from various district offices.

MIDWEST STEEL & SUPPLY CO. "Midwest" standard unit air filters; "Midwest" type C & D filters; "Midwest" steel sections; nitrol. Represented by H. C. Murphy and T. W. Murray.

MONTGOMERY CHEMICAL CO., Detroit. Full line of case hardening compound. A miniature exhibit of part of the company's commercial heat-treating department in Detroit. Represented by L. C. Dunn.

MOTCH & MERRYWEATHER CO., Cleveland, Ohio. Complete line of machinery in operation. Represented by George Merryweather, Stanley Motch and George Lawrence.

N

NATIONAL MACHINERY CO., Tiffin, Ohio. Forging machine exhibit. Represented by E. R. Frost, Charles Harmon, K. E. Ernst, D. J. Crowley, F. J. Mawby and F. W. Klenk.

O

S. OBERMAYER CO., Chicago. A complete line of high temperature furnace cements, namely, "Hot Patch," "Esso Bond" and "Esso No. 33." Other refractories made from these cements such as special shaped brick, "Carborundum" fire sand, various grades of imported Ceylon, polishing material, sand blast material, various grades of powdered and granulated charcoal, insulating materials, etc. Represented by John L. Cummings, J. Frank Newman and L. M. Geer.

OHIO MACHINE TOOL CO., Kenton, Ohio.. Metal working shapers. Represented by C. C. Swift, R. D. Shields, William Ochse, L. H. Peters, all of Kenton, Ohio.

TINIUS OLSEN TESTING MACHINE CO., Philadelphia. Complete line of small testing machines for determining the hardness of various materials, impact and alternate stress tests, repeated impact; ductility testing machines for determining the drawing quality of sheet metal as well as universal testing machines with all kinds of attachments for making hardness, ductility tests; also demonstrating for the first time the Owens test for welded material and welds as well as some new special Brinell hardness testing machines for determining Brinell hardness of sheet metals and softer metals. Will also demonstrate various extensometers, instrument strain gages, etc., as used in testing materials and also will have engineers available for discussing the Olsen-Carwen static-dynamic balancing machine as used by automobile manufacturers and others in balancing crankshafts, flywheels and various other types of rotors. Represented by Robert Bruce Lewis and Thorsten Y. Olsen.

P

PANGBORN CORPORATION, Hagerstown, Md. A sand-blast cabinet in operation; also photographs of installations of various types of sand-blast equipment in the steel-treating industry. Specimens of various grades of angular steel grit and Samsom steel shot, dustless sand-blast abrasives, will be shown in actual use in equipment demonstrating wearing qualities and finishes produced. Represented by John C. Pangborn, vice-president; H. D. Gates, sales manager; Charles T. Bird, district sales engineer, and W. C. Lytle, district sales engineer.

PARK CHEMICAL CO., Detroit. A complete line of materials for hardening and heat treatment of steel. Represented by D. W. Bauer, secretary, and J. N. Boring, vice-president.

PENN SEABOARD STEEL CORPORATION, Philadelphia. Die blocks, piston rods and trimmer steel and crankshafts. Represented by D. J. Crowley, Detroit district manager, and H. A. Baxter, general manager of sales.

Q

QUIGLEY FURNACE SPECIALTIES CO., New York. "Hytempite," a plastic refractory material for bonding fire brick and other refractories; "Carbosand," a highly refractory granular material for making rammed in linings, furnace bottoms, special tile, etc.; high temperature insulation in brick, block, powder and cement form for retarding heat flow through furnace walls, ovens and similar heated equipment. Represented by W. S. Quigley, president; Q. H. Gaylord, Jr., traveling sales manager; W. A. Toohill and H. M. Thompson.

R

W. S. ROCKWELL CO., New York. Automatic type heat-treating and annealing furnaces in operation. Represented by C. D. Barnhart and H. J. N. Voltman, New York; M. L. Hollister and R. M. Atwater, Detroit, and W. C. Squire and C. P. Cogswell, Chicago.

RODMAN CHEMICAL CO., Verona, Pa. "Carbo" case hardening compounds, "Sealright" luting material. Represented by Hugh Rodman, general manager, and Gordon A. Webb, metallurgist.

S

SHORE INSTRUMENT & MFG. CO., Jamaica, N. Y. "C-1" bulb type scleroscope and "D" recording scleroscope; these instruments are for testing hardness in metals and various other products that are capable of taking a permanent indentation; also "A" and "B" type optical pyrometers; these pyrometers are for indicating the temperature of articles within the furnace independent of the temperature of furnace. The range of these instruments is from 1200 deg. Fahr. to 3000 deg. Fahr.; also a display of "Durometer," an instrument to test the hardness of plastic articles such as rubber compositions, etc.; also "Elastometer" to test the elasticity of rubber; also "Local-Case," used for selective carbonizing, and "Local-Hard," used for selective hardening, as in tool steel. Represented by F. G. Kendall.

SIMONDS MFG. CO., Lockport, N. Y. Steel bars and products; saws and knives. Represented by C. R. Paffenbach.

SPENCER TURBINE CO., Hartford, Conn. Turbo compressors for supplying air for oil and gas burning furnaces, including one 900-c.f.m. machine at 1½-lb. pressure, in operation supplying air for the gas burning furnaces in operation; also a 450-c.f.m. machine. Represented by S. E. Phillips, secretary; H. M. Grossman, sales engineer; R. B. Richardson, Detroit, district manager.

STANDARD ALLOYS CO., Pittsburgh. Products obtained from the Carnotite ores of Colorado containing vanadium, uranium and radium. Will show views of the mines where these ores are found and something of the nature of the work necessary to recover these materials. Represented by Harry A. Kraeling, D. H. Horne, Hamilton Foley.

STANDARD FUEL ENGINEERING CO., Detroit. Several types of tool hardening furnaces showing a high-speed furnace under heat; will also show a line of refractories, including some very difficult shapes as well as high temperature cement; also oil burners. Represented by Theodore Q. Cleland, J. R. Dunne, Ellis B. Beeman and Herbert M. Bray.

STANDARD STEEL & BEARINGS, INC., Philadelphia. Annular ball bearings, single row and new style double row; steel balls in various stages of production; also the company's new style double row annular ball bearing. Represented by C. B. Wisenburgh, Western sales manager; B. H. Gilpin, sales engineer; L. A. Cummings, chief engineer, and H. A. Johnston, assistant to the sales manager.

SURFACE COMBUSTION CO., New York. Oven furnaces operating on surface combustion; low pressure system; impact and tunnel types of burners operating on surface combustion high pressure system. Represented by Messrs. Hollinger and Harris.

T

TAYLOR INSTRUMENT COMPANIES, Rochester, N. Y. Recording thermometers, pyrometers, oil tempering thermometers, molten metal thermometers, engraved stem thermometers and hydrometers. Represented by Mr. Howell, Pyrometer sales manager, and Mr. Hohes of the Coon-De-Visser Co.

N. & G. TAYLOR CO., Philadelphia. Forging bars of basic open-hearth straight carbon steel; samples of bars made by the company and examples of difficult forgings made from the company's product; also twisted and distorted bars, upset pieces, curious bends, etc. Represented by Hollinshead N. Taylor, president; C. H. Haligath, Western sales manager; George I. Allen, northern Ohio representative, and A. L. Wurster, Eastern representative.

U

UNITED ALLOY STEEL CORPORATION, Canton, Ohio. Various grades of alloy steel in hot rolled, heat treated and cold drawn forms. Fractures and physical tests will give an idea of the physical properties and structures obtained. In addition there will be displayed fabricated articles made from the company's alloy steel, such as automotive parts, shovels, industrial bearings, edge tools and oil well drilling tools. Represented by H. H. Pleasance, general manager of sales; J. D. Jones, district sales agent, Detroit; R. Wykoff, Detroit; J. F. White, Detroit; R. E. Sherlock, Canton; F. B. Mulvaney, Canton; F. W. Krebs, Canton, and J. G. Bell, Canton.

V

VANADIUM ALLOYS STEEL CO., Latrobe, Pa. Spindles, rolls and dies manufactured from the company's steels. Represented by J. P. Gill, metallurgist; A. F. MacFarland, Detroit manager; D. D. Dodd, Detroit office, and A. G. Henry, special representative; W. R. Mau, district manager Chicago office; J. H. Caler, district manager Cleveland office; R. R. Artz, Pittsburgh office, and D. A. Black, Boston office.

VANADIUM CORPORATION OF AMERICA, New York. Reception booth.

W

WESTINGHOUSE ELECTRIC & MFG. CO., East Pittsburgh, Pa. Full line of electric furnaces and controls in operation; ovens and space heaters; electric solder pots; tempering ovens; display of Krantz safety switches. Represented by Carl C. Boos, Wirt S. Scott and Brent Wiley.

WILSON-MAEULEN CO., New York. Pyrometers as suited to hardening and tempering furnaces; "Tapalog," which is a multiple type pyrometer recorder for annealing furnaces, and three sizes of the Rockwell direct reading hardness tester with diamond cone test point. Represented by C. E. Hellenberg, Harvey Lee and Harry Goldsen.

WITHEROW STEEL CO., Pittsburgh. Various forging and forging blanks as rolled by the Witherow process, together with exhibit entitled the "Evolution of an Axle." Represented by Mr. Witherow, president; G. R. Norton, steel works manager; W. C. Emory, metallurgist, and L. A. Daines, sales engineer.

Electricity Applied to Industrial Heating

American Electrochemists Conduct Symposium at Montreal Meeting—Equipment for Heat Treating Steel—Lower Temperature Applications

THE feature of the fall meeting of the American Electrochemical Society was a symposium on electric industrial heating. It was the society's forty-third convention which was held in Montreal, Canada, Sept. 21 to 23, at the Hotel Windsor. This is the first time that an American technical society has devoted the major part of its program to this subject.

Symposium on Industrial Heating

Two sessions out of four were entirely taken up with papers dealing with the principles which rule and the equipment which is necessary in the comparatively new but rapidly growing development of the use of electricity for industrial heating. The papers dealt largely with electric furnaces used in the ferrous and non-ferrous industry but more particularly in the field of low temperature work rather than in that of high temperatures. The symposium was managed by the electrothermic division, of which Bradley Stoughton is chairman.

At the two sessions comprising the symposium, 13 papers were presented. Of these, two dealt with new non-ferrous melting furnaces, one with electric steam generation furnaces, and two with electric heating as applied to the enameling and ceramic industries. The other eight papers covered largely the application of electric heating to heat-treatment and other phases of the metal industry, particularly furnace design.

Generation and Application of Electric Heat

The symposium was introduced at the session on Thursday afternoon by a paper by E. F. Collins, engineer General Electric Co., Schenectady, N. Y., entitled "Electric Heat, Its Generation, Propagation and Application to Industrial Processes." Asserting that heat generated electrically is not essentially different from that generated by combustion or application, the author classified the methods generally employed for the conversion of electric energy for industrial heating as follows:

1. By the passage of current through a solid, laminated or granular conducting medium or resistor.
2. By the flow of current through a liquid or fluid conductor.
3. By the flow of current through gas or air.

In the first case, the conducting medium may consist of material that is to be treated, or the heat developed in the resistor may be transferred by conduction, convection or radiation or by all three; and in the second case, electrolytic or non-electrolytic conditions may prevail, while in the third the most familiar example is arc furnaces, in which electric arcs play between two or more electrodes nearer the material to be heated or between one or more carbon electrodes and the material to be heated, as in electric steel melting furnaces.

The author then divides into 20 classes the industrial processes to which electric heat may be applied, from warmers and heaters up to steel melting and refining furnaces, as well as special furnaces, the latter applying to special high temperature furnaces. The paper from this point on is a discussion of the principles and laws which govern various branches of this subject, illustrated by tables and charts.

In closing the author has a word to say about the over-all cost of electric heating:

Cost of Electric Heating

I recently reviewed a table made up to show the cost of the electric heat treatment involved in terms of factory cost of the part. The entire cost of heat treating electrically averaged to be about 0.86 per cent of the total factory cost with electric power at 1c. per kw-hr., as against 0.29 per cent for oil at 5c. per gal., or a difference of 0.0057 per cent, which is about 6-1000 over oil heating.

Whether that advantage comes from increased quality, increased production, decreased floor space, better working conditions, ability to duplicate results, temperature control, uniformity of product, decrease in rejects, decrease in labor or some other element entering into the total cost of production, matters not. Fortunately for electric heating, when these conditions are all taken at their increased value due to the electric process, the balance is in increasing numbers found to be on the side of the electric heat.

In the discussion of this paper F. J. Ryan, president F. J. Ryan & Co., Philadelphia, stated that agreement is general that too little attention has been paid, in the application of electricity to industrial heating, to the demands of consumers. What the consumer needs is now the chief question. "Our company is to-day receiving specifications from consumers for new equipment and it is no longer as necessary as it was to seek to interest the consumer. Manufacturers of electric equipment must now face this new condition. The time has passed when too much attention should be given to fundamentals which are now well established and, although much of the credit of the development of the industry is due to the consumer, particularly as to bearing the expense, it is now necessary to study each case in all its details."

Dwight D. Miller, industrial heating engineer Union Gas & Electric Co., Cincinnati, argued that electric heat accomplishes the same result in less time and turns out a larger quantity of material of better quality than fuel furnaces as a rule, or, in other words, that laboratory accuracy is obtained on a tonnage basis. He insisted that most users of heat-treating equipment do not know their actual cost.

At the close of the discussion, Mr. Collins insisted that electric heat should not be applied unless suited to the conditions and advocated a careful study of the application to which it is to be put before adopting it.

High Temperature Furnace Design

"The Principles of High Temperature Furnace Design" were discussed by E. L. Smalley, manager Electric Heating Apparatus Co., Newark, N. J. In his absence, Wirt S. Scott, of the Westinghouse Electric & Mfg. Co., presented an abstract, part of which is as follows:

The best electric furnaces, judged from the view points of highest quality of products, lowest cost of operation and maintenance, and greatest safety in operation at high temperatures, must have these attributes: Muffled type where best suited to the process. Exposed element or radiant form only when best adapted to a process. Must have elements of sufficient number of cheap renewal. Elements must be readily and easily renewable. Coils must be fully supported, and yet free for expansion. Refractory parts must be thoroughly supported, but free for expansion. No internal connections of coils should be tolerated. Terminal sizes should be larger than the element size. Source of heat must be uniformly distributed. Size of furnace must be governed by the charge. Placement of elements should not control the furnace size. Thermal efficiency should be a controlling feature in decision. Transverse section of heating elements should be round. Exposed elements should preferably be in corrugated grooves. Elements should not be chosen to suit a voltage. Total weight of heating element should be high in proportion to the weight of the charge. Efficiency of heat insulation must be adapted to the work to be performed. All of these characteristics, when properly combined with one another, will make the furnace most successful.

In commenting on the paper, Mr. Scott stated that

in the muffle type, a uniform temperature is more readily obtained than in the fuel combustion furnace and he also advocated the necessity of heating the four sides of a car bottom type of heat treatment furnace.

Alloys Used as Electric Resistors

A paper of considerable interest to the heat treatment phase of the industry was presented under the title of "Some Electrical Properties of Alloys at High Temperatures" by M. A. Hunter and A. Jones, both of the Rensselaer Polytechnic Institute, but the former also director of research for the Driver-Harris Co., Harrison, N. J. The paper deals largely with the alloys suitable for resistance materials in furnaces where electrical energy is converted into heat energy. The authors state that on the subjects of metals and alloys a considerable amount of information on their specific resistance and also as to their temperature co-efficients between room temperature and 100 deg. C. is available but that over higher ranges of temperature data are meager or entirely lacking. The author's paper is an attempt to clarify the situation and to give the results of determinations of the specific resistances of a number of metals and alloys now in commercial use over a range of temperature from room temperature to 1000 deg. C.

The materials used in the heating elements of commercial units may be divided into two classes, according to the authors. The first class comprises those which require materials with high specific resistance at the operating temperature. The second class includes those materials which, in addition to having a high specific resistance unit, must also withstand oxidation. The first class of materials can be operated successfully at temperatures not exceeding 500 deg. C. The second class may be used with more or less satisfaction up to 1100 deg. C. In the first class the various grades of nickel have been investigated, together with two alloys of copper and nickel—Monel and Advance—and two alloys of iron and nickel—alloy No. 141 and alloy No. 193. In the second class the various grades of nichrome have been considered.

It is claimed possible from the data contained in the paper to calculate the specific resistance of any material in either class at any operating temperature.

During the brief discussion of this paper, Dr. Colin G. Fink raised the question as to whether there would not be less oxidation if higher chromium alloys were used, in response to which Mr. Hunter, who presented the paper, said that this could not be made when the chromium was in excess of 25 per cent of the nickel contained. He also stated that wire usually breaks down due to segregation in the original metal more often than due to oxidation.

E. F. Collins testified that from practical experiments with many of these alloys he had found that, as between round wires and flat ribbons, preference should be given to the latter because they last longer.

Granular Resistor Carbons

A paper entitled "Resistivities of Some Granular Resistor Carbons," by Clyde E. Williams, metallurgist U. S. Bureau of Mines, Seattle, Wash., and Gordon R. Shuck, professor electrical engineering, University of Washington, also at Seattle, was presented in the absence of the authors by F. A. J. Fitz Gerald, Fitz Gerald Laboratories, Inc., Niagara Falls, N. Y. The paper is based upon experimental work being conducted at the Northwest Experiment Station of the Bureau of Mines, in co-operation with the University of Washington at Seattle, during which it was necessary to determine the electrical resistivities of a number of granular carbon resistor materials which are used in the heating elements of some types of electric furnaces. Disclosing the important requirements of a satisfactory resistor material, the authors outline these as:

1. Small change in resistivity with different temperatures in order to avoid too much regulation of current.
2. A low ash content to obviate too frequent renewing of heating element.
3. High resistance to oxidation.
4. Sufficient density, physical strength and hardness to withstand mechanical forces tending to break up particles.

Two common resistors are granular resistor carbon and granular resistor graphite, both made from petroleum coke. The paper contains a description of the furnace which was used and also several charts showing the resistance in ohms per cubic inch of the various materials investigated. A summary of the paper follows:

The resistivities of several different types of carbon have been measured. It is not suggested that these materials be used for resistors, their characteristics being described so that their limitations may be seen. The information should be of value for purposes other than the design and operation of resistance furnaces. For example, in the operation of electric smelting furnaces it is of value to know the electrical resistances of the various reducing agents that may be used, and in the operation of melting furnaces the resistivity of the carburizer should be known.

The difference in resistivities of various types and sizes of carbon resistors is not very large at 1000 deg. C. to 1200 deg. C.

The temperature co-efficient of resistivity is negative for all the forms of carbon tested up to 1000 or 1200 deg. C., at which temperature it approaches zero and then becomes positive as the temperature increases further. This change was more pronounced in graphite than in the other forms of carbon. The resistivity increases as the size of the particle decreases.

High resistivities are caused by the presence of volatile matter in the resistor material, the resistivity and volatile matter bearing a direct relation for the same material.

Ash contained within the particle of carbon increases the contact resistivity and the thermal co-efficient somewhat, but the effect is not nearly so large as is that of contained volatile matter. Extraneous ash or foreign matter of high resistivity increases the resistivity and the thermal co-efficient to a very marked extent.

A paper by Wirt S. Scott, manager industrial heating section, Westinghouse Electric & Mfg. Co., Mansfield, Ohio, which was not available in printed form, was presented in brief abstract by the author.

Heat Treating Steel Economically

At the second session of the symposium on electric industrial heating, one of the most interesting papers which was presented was entitled "Methods of Economically Handling Materials in Electric Furnaces," by Frank W. Brooke, engineer Swindell & Co., Pittsburgh. This paper was not available in printed or in manuscript form, but was delivered by the author and illustrated with lantern slides. He discussed several types of electric heat treatment furnaces at present in use in the American steel industry and showed that many of these were improvements over previous designs so that they now operate more economically than formerly.

In the heat treatment of steel castings, present practice in many plants involves the removal of the castings from the annealing furnaces after they have attained the proper temperature so that they can cool in the air. This involves the loss of a large amount of heat. To take advantage of some of this lost heat, Mr. Brooke described certain recuperative furnaces which involved the use of so-called dummy furnaces. Beside the regular furnace in which the castings are brought to a heat, there are two additional chambers of similar design built separate from the heating furnace but intercommunicated. Into one of these is brought the cold castings on a car and into the other chamber of this there is placed the car of hot castings as soon as it is removed from the heating furnace. In this way a cycle of operations is maintained so that while one car of castings is being brought to a heat, the car just removed from the furnace is communicating its heat, during the cooling period, to the other car of cold castings before it is pushed into the main heating furnace.

Another interesting type of furnace for the heat treatment of steel described by the author is the counter-flow type of furnace. This furnace really consists of two parallel compartments of seven zones each, through which cars are operated on tracks. The middle zone of each compartment is the furnace where the steel is brought to the proper temperature. The cars of material pass out of the heated furnace during the process of cooling them and are transferred through the other zones, at the same time passing cold material

moving in the opposite direction which absorbs heat from the hot cars as they are cooling off. In this way, the furnace is reciprocative on both sides.

Discussing continuous furnaces, Mr. Brooke stated that few of these are economical and are limited to the temperature which can be reached, as well as to the heat losses from one end to the other. In such furnaces where chains transfer the material mechanically through the furnace, the temperature which the chain can stand is a limiting factor. He also mentioned the doughnut continuous furnace, which is really a continuous chain, working in a circle, the steel being brought out near the spot where it is first put in. This type of furnace is quite generally used in the motor car industry on small parts. For continuous furnaces, Mr. Brooke advocated the pushing type as one of the best. There are some of these where the steel, after it has reached its proper temperature, falls into a quenching medium through a liquid seal; they are extensively used on connecting rods and on uniform cylinders in the motor industry. He considered this a coming type for economically heat treating materials.

Mr. Brooke also mentioned the walking beam type of heat-treating furnace as a fascinating one, but having certain disadvantages in that the material is often likely to form a bridge as it passes through the furnace. He mentioned particularly a type of furnace for the heat treatment of certain shapes of steel which employs a walking beam, having a saw tooth arrangement, which lifts the material from one tooth to another set of teeth, which are stationary, thus transferring the material from the furnace easily and regularly, resulting in what he considered uniform treatment but limited in certain ways to special materials. Another furnace mentioned by the author was one in which balls for ball bearings are treated, the material passing through special grooves and the whole furnace rotated. This, however, is more especially used in fuel-fired furnaces than in electric. This paper will be available in printed form later.

Heat Insulating Materials

The subject of heat insulating materials for electric heating apparatus was discussed in a paper of that title by J. C. Woodson. This paper also was not in printed form, but was abstracted by the author from his manuscript. Insulating materials, according to Mr. Woodson, are divided into five grades. The first two embrace temperatures up to 350 deg. Fahr.; the third from 350 to 600 deg. Fahr., particularly in the japanning industry; and the last two from 600 to 1000 deg. and from 1000 to 2000 deg. Fahr., both embraced in the heat-treating industry. In the last two groups the author stated that there were only three or four reliable insulating mediums, among which could be mentioned diatomaceous earths, silicates and other earths. In this field he claimed that chemists could do much efficient work.

In the discussion of this paper Dr. Carl Hering, consulting electrical engineer, Philadelphia, pronounced the subject full of interest and emphasized the fact that surface losses on the outside of heating equipment should be more fully considered and mentioned white wash as a better insulating medium for outside purposes than some of the more expensive. He also referred to some experiments of the General Electric Co. some years ago in the use of wool and similar materials as insulators, which showed that if these were compressed to a certain extent the insulation increased, but if compressed too far their efficiency in this respect was diminished.

The efficiency of air spaces as insulators was spoken of by Henry Howard, Grasselli Chemical Co., Cleveland, as being of little value at high temperatures but of some advantage in low temperature work. Dr. Alfred Stansfield called attention to the fact that the life of refractories in high temperature furnaces, as in steel-melting equipment, must be considered in the choice of insulators, and Mr. Brooke cited a case where a 4½-in. covering of silocel in a certain equipment caused disastrous results because of too much insulation.

The author in commenting on the discussion stated that in electric heating equipment, having for an outside surface black iron or galvanized sheets, the latter were 50 per cent better in efficiency and also that in cases where the density of the insulating material had to be considered, the insulating was better at certain densities than at others. In high temperature insulation the author stated that, in cases not above 2000 deg. Fahr., it was more a question of mechanical problems than otherwise.

Electric Heat Treating of Malleable Iron

The subject of the heat treatment of malleable iron electrically was covered by a paper by C. B. Gibson, Westinghouse Electric & Mfg. Co., Pittsburgh, entitled "Electric Annealing of Malleable Iron." This paper also was not in printed form, but was very briefly abstracted by the author from manuscript. Mr. Gibson stated that the electrical phase of this subject had not been carried very far and that very few electric furnaces were in operation on a commercial scale. It was his opinion, however, that on a B.t.u. basis fuel-fired furnaces had the better of the argument, but in electric furnaces he believed that the heat could be more effectively utilized. He stated that the American Malleable Castings Association was at present conducting extensive tests on the annealing of this iron by electricity. In the discussion E. O. Wilson raised the question as to whether a deposit of carbon on the resistor ribbon did not result when electric annealing of malleable iron was carried on without packing, but it was the opinion of the author that it had not been demonstrated that annealing could be carried on without packing.

Electric Steam Generators

The subject of the production of steam by electric generators was brought before the convention by a paper, "Electric Steam Generators and Their Application," by P. S. Gregory, Shawinigan Water & Power Co., Montreal, Canada. According to the author, the production of steam by means of electric energy is not a new process. The water resistance type of electric steam generator has been in use in Europe for about 15 years, though principally only in small sizes of 1000 kw. or less. In general, the cost of an electric energy is such that it cannot be used commercially for the production of steam, but there are certain circumstances under which, even on a large scale, this becomes economically feasible. The required conditions for such application are a surplus amount of electric power for which there is no other use at certain times or a cheap supply of power.

In conclusion, the author stated that the water resistance type of electric steam generator has now been developed to such a point that there is on the market to-day an apparatus suitable for the conversion of surplus electric energy into steam on almost any given condition. Furthermore, in cases where power is cheap and where fuel is expensive or in special industrial processes, the electric steam generator can economically replace the coal-fired boiler.

Alternating current is employed in these generators, and the question of the extent of electrolysis was brought up, to which P. H. Falter, general manager Canadian Electro Products Co., Montreal, replied that not much is known as to the amount of electrolysis and that electrodes wear out in proportion to the input of energy. He stated, however, that where current of 60 cycles is used there is less corrosion than when current of 25 cycles is employed.

New Melting Furnaces

The program at this session included two papers on electric melting furnaces, one entitled "A New Induction Furnace" by J. Murray Weed, power and mining engineering department, General Electric Co., Schenectady, N. Y., and another entitled "A Simple Electric Crucible Furnace for Melting Aluminum" by A. Glynne Lobley, director of electrochemical laboratories, Victoria University of Manchester, England.

The new induction furnace was described in THE

IRON AGE, Aug. 3, 1922. Dr. Hering introduced a discussion of this paper by stating that he was glad that this furnace was another example of the advantage derived from electromagnetic forces which work efficiently in the cleansing of molten metals in that they bring the impurities to the top. He stated that there were at least 100 furnaces similar to this in use, but that he could not agree with the author's explanation of the working of the furnace, which he regarded as too involved. John A. Seede, electric engineer General Electric Co., called attention to the uniflow principle of this furnace and also to the fact that it could successfully melt copper, aluminum, etc. The paper on an aluminum melting furnace describes a case in which electricity was applied for the melting and keeping molten of aluminum for die-casting small objects.

Electrolytic Iron

Two papers of general interest to the steel industry were among those presented at the first session Thursday morning, Sept. 21. The first of these was entitled "Effect of Heat Treatment on the Hardness and Microstructure of Electrolytically Deposited Iron" by Norman B. Pilling, metallurgist research laboratory, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. It has been found commercially practicable to deposit iron electrolytically on castings which have either been worn or which have turned out to be imperfect when cast, and this paper amplifies this subject, which was first introduced by a similar paper at the June convention of the American Society for Testing Materials. According to this practice, both in Great Britain and in the United States, this method has afforded a means of salvaging valuable machine parts in which certain critical dimensions were undersize. After an electric deposition of a layer of iron it has been possible to machine the parts back to the size desired.

The deposited iron has certain unusual physical characteristics and Mr. Pillings' paper discusses some of these and the method of overcoming their objectionable features. The results may be summarized in part as follows: By annealing to 300 to 400 deg. C., the initial hardness may be considerably increased and with the present material the scleroscope hardness was increased from 26 to 45, the latter equivalent to the hardness of an annealed high carbon steel containing 1.20 per cent carbon. The brittleness of the material as deposited may be removed by annealing at 300 to 400 deg. C. For complete and rapid softening, annealing at a relatively high temperature, 800 to 900 deg. C., is necessary.

The other paper in the electrolytic iron field described the "Preparation and the Mechanical Properties of Vacuum-Fused Alloys of Electrolytic Iron with Carbon and Manganese," whose compositions were so chosen as to bring out the specific effects on pure iron of additions of manganese of carbon, and of carbon and manganese together in varying relative proportions. The maximum content each of carbon and manganese in each series is about 1.5 per cent; the minimum, zero per cent, or pure iron. The data are tabulated in the paper in the order of increasing carbon for comparison and interpretation of results. The effects of carbon are shown by grouping the specimens according to manganese contents and plotting curves for each group, with values from tests for ordinates and carbon contents for abscissas. The effects of manganese are shown in a similar manner by regrouping the specimens according to carbon contents.

Electricity in Enameling Automobile Parts

There were two interesting papers on the application of electric heat to the enameling and ceramic industries. The first was by Wirt S. Scott, entitled the "Development of Industrial Electric Heating for Low Temperature Enameling." The paper is largely historical and relates various steps in the experience of the company toward perfecting apparatus, particularly in the automobile industry. In response to a question, the author stated that at least 90 per cent of low temperature enameling is now done by electric heat.

"Firing of Ceramics in Electric Furnaces" was the title of a paper in this field by E. L. Smalley. The author discusses in this paper properly designed furnaces and makes certain claims concerning the kind of product which it is possible to produce in these furnaces.

Dezincification of Brass

An interesting paper in the non-ferrous field was one entitled "The Dezincification of Brass," by Ralph B. Abrams, senior in chemical engineering, University of Wisconsin. The paper covers experiments, the results of which indicate that the maximum of dezincification appears to be: First, the dissolving of the brass as a whole; the redeposition of the copper in solution so as to replace brass as a unit, this redeposition not taking place unless there is some means of holding the dissolved copper in contact with the brass. How this can be done is described in the paper and the details of the experiments are also given.

The Next Conventions

The next meeting of the society will be held in New York in April, the date to be decided upon later. A symposium at this meeting will embrace the manufacture and use of some of the rarer metals as ferroalloys for steel and special alloys. This is to be in charge of F. W. Beeket, Electro Metallurgical Co. of America, New York. Another symposium will cover electrode potentials, in charge of Dr. William G. Hirsch, Massachusetts Institute of Technology, Cambridge, Mass.

At the annual fall meeting in 1923 an attempt is to be made to schedule a symposium on the electrolytic refining of metals and also one on conduction through gases.

The Montreal meeting this year was unusually well attended, total registration exceeding 200, which is equal to the average attendance at most of the conventions. A large majority of those attending made the special trip to Shawinigan Falls, Canada, on Saturday, where the electrochemical industries and the hydroelectric plant were visited. The regular session of "Section Q," which constitutes the smoker, was a successful meeting held on Friday evening before the departure for Shawinigan.

Blast Furnace Operations

The 500-ton merchant stack at Struthers, Mahoning County, operated by the Struthers Furnace Co., New York, formerly of Cleveland, will be blown in Oct. 2, following idleness since Jan. 20, 1921. Arrangements have been made for beehive coke, to be secured from the Connellsville region. The furnace, a producer of foundry and special irons, will go in on foundry grades. It employs 150 men.

Mattie blast furnace at Girard, Ohio, operated by the A. M. Byers Co., Pittsburgh, resumed Sept. 22, after being idle several months on account of interruption to fuel supply. Output is consumed in the puddle furnaces of the company's Girard property.

Of the 47 stacks in the Mahoning and Shenango Valleys, 24 are now pouring, 20 in the Mahoning Valley. This compares with a high of 26 in June in both Valleys. District iron capacity is operating at fully 65 per cent.

A St. Louis Blast Furnace Record

From Sept. 1 to 15, inclusive, the blast furnace of the St. Louis Coke & Chemical Co., Granite City, Ill., produced an average of 505 tons of foundry iron, daily, running from 1.75 to 2.75 per cent in silicon, on an average consumption of 1719 lb. of coke per ton of pig iron, the average ash of the coke being 13.38 per cent. In August the furnace averaged 485 tons of iron per day on 1852 lb. of coke per ton of pig. The coke ovens were using 100 per cent West Kentucky high volatile coal at that time. Since the settlement of the strike, the company's Illinois coal supply has been coming in with the result that the furnace has been running on Illinois coke during September.

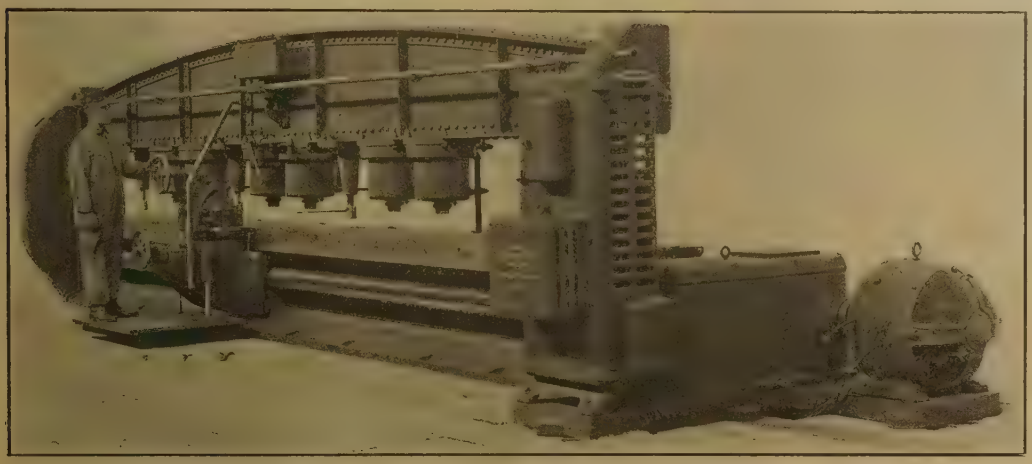
New Design Plate Planer

The accompanying photograph illustrates the new design of the Niles-Bement-Pond plate planers. The bed and the carriage are designed to prevent chips from getting on the bearing surface of the carriage and screw. The tool carriage is attached to the front vertical side of the bed. It is secured top and bottom by removable bearing supports, which will permit the carriage to be taken from the bed at any part of its length. The bearing surfaces are provided with taper gibs for taking up wear.

Two relieving tool holder slides are mounted on a standard and have simultaneous vertical adjustment by means of a screw and hand wheel, and horizontal adjustment to the standard through screw and hand wheel. Both tool slides are provided with swiveling feature to allow the planing of bevels. The drive screw is supported in a trough with an oil channel of sufficient depth to cover the full depth of the thread with oil. Roller bearings are provided to take the end thrust of the screw. The carriage is reversed automatically at any desired position by contact with stops adjustable on the shifter rod. The operator can start, stop, or reverse the carriage by manipulating this shifter rod by hand. This can be done with very little effort on the part of the operator.

The pneumatic jacks are of the two-way type, that is, air is admitted in the top for clamping the plate, and the air is admitted at the bottom for unclamping.

The main driving gears are enclosed in a box, and dip in oil. The motor is controlled by a master switch attached to the shifter rod, and an enclosed panel with forward, reverse, accelerating, and dynamic brake contactor. A push button is mounted on the right hand housing, so that the machine may be started and stopped without manipulating the shifter rod. The cutting speeds range from 20 to 40 ft. per min.



Bed and Carriage of Plate Planer Are Designed to Prevent Chips from Getting on Bearing Surfaces or Screw

Wrought Iron from an Old Chicago Bridge

A wrought iron bridge was built over the Chicago River in Chicago in 1884, known as the Rush Street drawbridge. It was recently dismantled and an examination of the character of the metal was made by C. A. Akerlind, machinery inspector, who made his report to Thomas G. Pihlfeldt, engineer of bridges for the city of Chicago. The *Engineering News-Record* gives an account of some of the results of this examination which are in part as follows:

Tensile tests on two samples from the web of a 10-in. channel gave the following results, the lower elongation in the second piece being due apparently to a crystalline spot.

Elastic limit, lb. per sq. in.....	33,050	34,180
Ult. tensile strength, lb. per sq. in.	49,950	49,300
Elongation in 8 in. (%).....	22	15

Etching tests were made on specimens cut from truss rods and eyebars, and the report on these is as follows:

The 1⅜-in. truss-rod specimens are particularly interesting as they show clearly that the bar is built up of muck bars and therefore is real new wrought iron. The 1⅞-in. specimen makes a rather prettier showing, but the bloom from which this bar was rolled was made up of scrap iron.

The 5 x 1-in. eyebar specimen shows the bar to have been rolled from a pile of muck bars, all new wrought iron. A small specimen cut from one of the broken test pieces of the channel iron indicates clearly that that channel was rolled from a bloom made up of scrap iron. This particular piece offered greater resistance to the acid than any of the others, indicating that some of the scrap used has consisted of "refined" or even "double refined" wrought iron. The 5 x 1-in. specimen indicates clearly the different qualities in the material to resist corrosion.

Cost of Living Stationary

Monthly figures of the Bureau of Labor Statistics show the wholesale prices of all commodities during August, as in July, to be 55 per cent above the average for 1913, compared with 50 per cent in June. Six of the nine individual groups showed a rise in August compared with July. Farm products and foods showed slight decreases.

Metals and metal products, which now stand at 26 per cent above the 1913 average, are far lower than the average group. The highest item on the list is now fuel and lighting.

Our table shows the figures for the two most recent months and for August, 1921, and the peak in 1920. It shows also the present status of net liquidation from the 1920 peak prices, of the excess of the peak prices over the average of 1913. Despite recent sharp advances, metals still stand liquidated to a greater extent than any other specific group except chemicals and farm products:

Index Numbers of Wholesale Prices, by Groups of Commodities

(1913 equals 100)

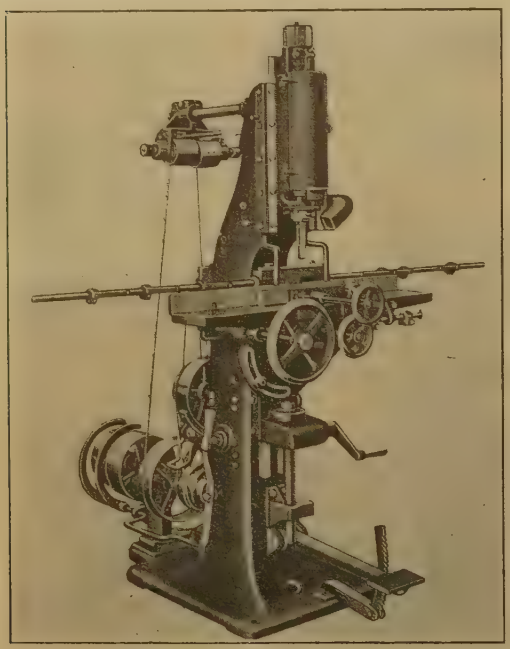
	1920 Peak	1921 Aug.	1922 July	1922 Aug.	Liquidation, Per Cent
Farm products	247	123	135	131	79.9
Food, etc.	248	146	142	138	74.3
Cloths and clothing..	346	171	180	181	67.1
Fuel and lighting....	281	184	254	271	5.5
Metals and metal products	203	117	121	126	74.8
Building materials...	300	156	170	172	64.0
Chemicals and drugs	213	129	121	122	80.5
House-furnishings goods	275	179	173	173	58.3
Miscellaneous	208	119	114	115	86.1
All commodities	247	142	155	155	62.6

The annual sales convention of the Kerr Turbine Co., manufacturer of steam turbines and gears, was held at the plant, Wellsville, N. Y., on Sept. 11, 12 and 13. General renewed activity in business was reported from all sections.

Power Feed Hollow Chisel Mortiser

New in a line of machines suitable for the pattern shop, the Oliver Machinery Co., Grand Rapids, Mich., has brought out the Oliver No. 92 hollow chisel mortiser. It will handle chisels from ¼ in. to ¾ in. square. The stroke is adjustable from 2½ in. to 4 in.

The power feed mechanism is actuated by a foot lever and is brought into action by a belt tightener. This, when released, brings a brake into action on the rim of the driving pulley. A ratchet is provided to hold



The Power Feed Hollow Chisel Mortiser of the Oliver Machinery Co. Is Designed to Handle Chisels of ¼ In. to ¾ In. Square with Stroke Adjustable from 2½ to 4 In.

the lever down for continuous feeding. The throwing out of the ratchet for the continuous feed mechanism may be done in an instant and the machine then operated by single strokes. The power feed has three rates, 18, 26 and 36 strokes per minute by means of cone pulleys and a feed belt shifter.

A universal table with screw clamp for 6-in. width stock and a hand wheel rack and pinion for longitudinal travel are furnished. The table is 36 in. long, 6 in. wide and 32 in. above the floor at the lowest position and 44 in. above the floor at the highest position. It is fitted with a vertically adjustable back fence, indicated in the illustration, which has a lip hold-down and also carries a 6-ft. layout stop rod with six spring stops for automatically locating mortises on the pieces. Two swinging hold-down fingers are held in the column of the machine, projecting over the table to prevent the work from rising when the chisel recedes.

Lathe for Turning Commutators in Place

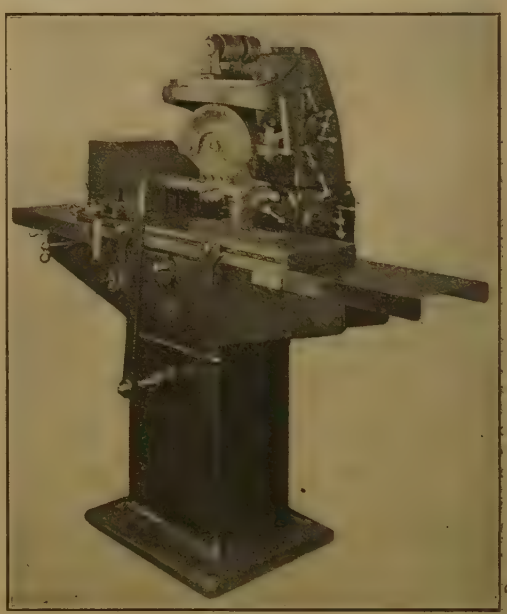
A portable commutator lathe for attachment to the motor or dynamo needing attention has been put on the market by George Bender, 122 Centre Street, New York. As ordinarily used, the device is clamped to the frame of the motor or generator with additional stays or supports to the bearing and other parts of the motor, and it is designed to take commutators of 2 to 12 in. face. It has an adjustable arrangement to take out end play of the rotating part of the motor. The lathe has six different set-ups. The slide rest is back geared in the ratio of three to one, so that a fine cut may be taken on the commutator.

As at present made, the lathe is available for caring for motors or dynamos of 5 to 200 hp., either direct current, or for alternating currents, slip ring turning. It is stated that a 30-hp. elevator traction motor was recently turned in position in three hours, whereas it might have take nine and a half days to take the armature out of the motor and do the turning and replace the armature. It is found usually desirable to slow down the speed of the machine, by means of resistance, to 300 ft. per min. and thus eliminate the danger of short circuiting the commutator.

Semi-Automatic Machine for Sharpening Hobs and Form Cutters

A machine for sharpening hobs and form cutters has been added to its line of special grinding machinery by the Harris Engineering Co., Bridgeport, Conn. It is designed to permit ready adjustment of the grinding face of the wheel so that hobs may be either ground radially or under-cut to give the necessary hook or top-rake; it is designed to take care of hobs with straight or helical flutes, to index hobs correctly as to the number of flutes, and in general it is designed to allow for adjustments that may be readily accessible so far as the operator is concerned so that accurate results may be obtained. As described by the Harris company, there are seven specific requirements in a machine for the work described and all of these are fulfilled by the Harris development. In a word, the machine is the answer to a call for a grinding machine to meet conditions where the amount and variety of work does not warrant the use of a full automatic grinding machine.

The hob or cutter to be sharpened is carried on an arbor with a taper shank fitting into the work carrying spindle. The outboard end of the work is supported by a center in an adjustable tailstock. Ball roller bearing mountings of the table are calculated to be so sensitive that the operator can tell from the feeling whether the grinding is too fast or too heavy. Hobs having helical flutes are rotated during the travel of the table by a sine bar which is adjustable to different



Harris Semi-Automatic Hob and Form Cutter Grinding Machine for Conditions Where the Character and Number of Jobs Does Not Warrant a Full Automatic Machine

angles. The index plates interchange with those on the full automatic hob grinding machine.

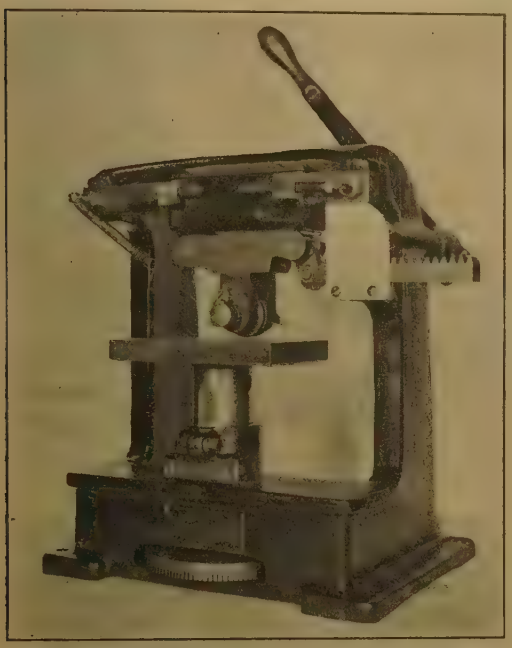
The machine is designed to take care of work of a maximum diameter of 8 in., and a length of 10 to 12 in., and of 4 to 26 flutes. It occupies a floor space of 50 x 90 in., and weighs 1760 lb.

The Morris Tool Co., Inc., manufacturer of tools and tool holders, mentioned in the Sept. 7 issue of THE IRON AGE, is located at 808 Lincoln Place, Brooklyn, N. Y., instead of the address there given.

Bench Type Marking Machine

To meet the demand for a marking machine capable of marking four lines of 1/16 in. lettering on round or flat articles up to 2 in. in diameter, the No. 13 bench type marking machine illustrated has been designed by the Noble & Westbrook Mfg. Co., Hartford, Conn., maker of marking and graduating machines and engaged also in steel die engraving.

The marking is done by means of steel marking die. On flat articles the die rolls over the article and on round articles both the die and the article roll together. The machine, which has a maximum distance



Machine Designed to Mark Four Lines of 1/8-In. Lettering on Round or Flat Articles

of mark of 2 in., is similar to the Noble & Westbrook marking machine, except that the pressure is applied from the top by a cam movement worked through a rack and pinion and not through the table as in the larger models of marking machines. The slide is fitted with roller bearing and the table can be raised by a hand wheel by the thousandths of an inch and locked in the proper position.

It is stated that small drills, reamers, knives, chissels or similar parts can be marked at the rate of about 700 an hour. The machine occupies a bench space of 10 x 12 in., and weighs 60 lb. It is furnished with one die holder of suitable design for either flat or round parts as desired.

Increasing Activity at Springfield, Ohio, Plants

SPRINGFIELD, OHIO, Sept. 26.—Forces at the Springfield manufacturing plants are being steadily increased. Manufacturers believe that the settlement of the rail and coal strikes will be followed by a marked improvement in business within the next few months.

More than 200 have been added to the force at the plant of the Robbins & Myers Co. during the past ten days. Within the next two weeks, it is expected that the force will be greatly enlarged.

Fifty men have been added to the force at the plant of the Ohio Steel Foundry Co. during the past week. The company is now employing 250 men on the day force and 50 on the night shift. Miscellanenous orders are coming in satisfactorily.

Heavy shipments are being made from the plant of James Leffel & Co.

An average of fifty motor trucks are being turned out each month at the plant of the Kelly-Springfield Motor Truck Co. The production in the last month was reported at 54 trucks. There is an increasing demand for trucks.

Fifty men were added to the sheet metal department at the plant of the International Harvester Co. in this city during the past week. Production is keeping up to schedule and shipments are going forward.

The Steel Products Engineering Co. received a good sized order during the past week for jigs and fixtures for the Studebaker Corporation, South Bend, Ind.

Extension Grinding Spindle Attachment

An attachment for its precision thread grinding machines, designed for internal grinding to a depth of 12 in. on holes of 2 in. or greater diameter, and a depth of 6 in. on holes of ½ in. diameter, has been developed by the Precision & Thread Grinder Mfg. Co., 1 South Twenty-first Street, Philadelphia.

A reproduced photograph shows an application in the grinding of a tapered bore in a milling machine spindle, a matter of importance to secure concentricity of the bore and thus to promote full service and long life of cutters, especially in cases of unhardened milling machine spindles.

Another application that is possible is that in which the grinding outfit with its extension spindle may be attached to the carriage of a lathe and thus employed to do grinding on a piece attached to the chuck, but having projecting obstructions which would otherwise render such grinding practically impossible. In a similar way lathe spindle tapered bores, which require truing occasionally to correct errors in concentricity and alinement, may be treated without the necessity of truing center each time a lathe is used on accurate work.

The extension housing is screwed to the projection

In Grinding the Tapered Bore in a Milling Machine Spindle the Grinding Machine Is Mounted on the Table as Indicated. Inserted sketch shows the means for securing rigidity of the extension grinder by means of a radial and thrust end ball bearing in the extension housing

threads in front of the regular spindle cap. This makes for accurate and speedy attachment. The extension spindle itself couples on the regular spindle by the tapered fitting joints, but is supported at the working end by a radial and end thrust ball bearing at the extreme outer end of the extension housing. The arrangement through the length of the spindle support aims at securing rigidity at the grinding end of the spindle.

Safety Wheel Dresser for Vertical Surface Grinder

A new style wheel dresser brought out by the Pratt & Whitney Co. for use on vertical surface grinding machines is shown in the accompanying illustration. It aims to give all the advantages of hand dressing without danger of injury to the operator. It consists of a bracket bolted or riveted to the wheel guard which supports the stem of the dresser. The dressing wheels are held in one end of the device, the bar being bent to fit under the wheel. The other end forms a handle so that the attachment can be easily moved into position. No change in the work and wheel relation is necessary and the device is quick acting and found to be efficient. It may be applied to grinding machines now in use and is furnished as regular equipment on new Pratt & Whitney machines.

The Grinding Wheel Dresser Is Carried by a Bracket and by Means of the Handle May Be Moved Readily into Position

Nitrol, New Case-Hardening Compound

A new case-hardening medium has recently been put upon the market by the American Kreuger & Toll Corporation, 522 Fifth Avenue, New York, under the name of Nitrol. The new compound is described as a nitrogenous powder, grayish to black in color. It is sold in two grades: Grade A, for surface hardening, and Grade E, for pack hardening purposes. The first grade is declared to be free from poisonous and obnoxious fumes; not to attack the pots and hence shorten their life; to effect an economy in fuel due to lower temperature than usual sufficing, and to leave a clean surface on the case-hardened material. Concerning the other grade, some of the advantages claimed are: Less fuel consumption; longer life of equipment; freedom from scaling and warpage; elimination of double heat treating and also the grain size of the core unaffected.

Calcium Silicide as a Deoxidizer

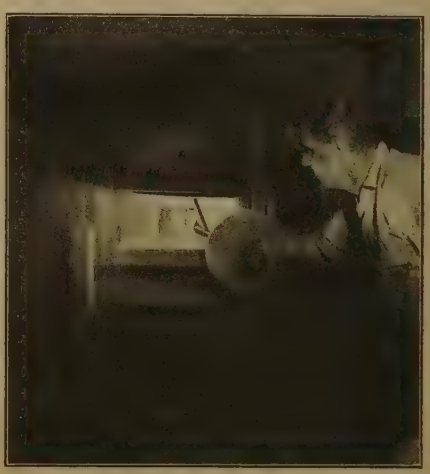
The use of calcium silicide as a deoxidizer of liquid steel is expanding in Great Britain, according to the London *Iron and Coal Trades Review*. This is due to the powerful deoxidizing characteristics of calcium, and will, under conditions where silicon alone is not sufficiently powerful, usually completely deoxidize the metal. Calcium metal has a powerful affinity for oxygen, and while the oxide, as well as silicon oxide, melts only at extremely high temperatures, mixtures of the two form silicate slags which melt at temperatures existing in the steel furnace. Such slags are insoluble in the metal, rise to the surface, and are easily incorporated in the normal slag, which is of the same nature.

The use of calcium as a deoxidizer under normal conditions should be quite safe, as any excess calcium left in the steel after the reaction is completed will be rapidly oxidized from external sources of oxygen in the surrounding air or volatilized, consequently there is little risk of leaving any trace of calcium in the steel.

Simple Device for Determining Critical Point in Steel

A new instrument for determining the critical point for steel, known as the Nilson Kritiskope, has been put upon the market by Herman H. Sticht & Co., 15 Park Row, New York. It is a light, self-contained, sensitive instrument and claimed to be entirely reliable in locating the definite critical point of any steel. The illustration shows the method of using this instrument in connection with a piece of steel being heated in a furnace. When the steel has nearly reached a cherry red, the door is opened partly and the Kritiskope inserted, so that the magneto-sensitive end first touches the material, and is then withdrawn a trifle. If the steel is still magnetic, the indicator is seen to remain in contact with the steel; the operation may be repeated from time to time as the temperature rises until the steel no longer attracts the indicator.

An important and special feature of this instrument is claimed to be the unique arrangement which guards it against loss of magnetism. The indicator itself, which comes into direct contact with the heated steel, is not itself magnetized and hence can be heated to a very high degree without injury. This indicator receives its magnetization solely by induction from a high grade permanent magnet located within the instrument itself. This magnet is protected against any undue rise of temperature by the design of the instrument and its thick walls. Since the device is exposed to the heat for a very short period of time only, injury to the permanent magnet is extremely remote. The instrument can be used in the course of hardening a small piece of steel like a tap when only a Bunsen flame is used for heating.



Nilson Kritiskope Determines the Critical Point of Steel by Indicating the Moment When the Steel Ceases to Be Magnetic

Some of the advantages claimed for this instrument are that it indicates by direct reading the condition of the steel; does not require any calibration; is not effected by vibration and is free of any leads or electrical connections.

The Neely Nut & Bolt Co., Pittsburgh, purchased 80 x 130 ft. with old buildings on South Twenty-second Street. The land adjoins the company's plant and will be used for extensions, bids for which now are being taken.

Tariff Commission Now More Important

May Make Broader Investigations and Recommend Rates— Possible Changes in Metal Schedule— Powers of the President

BY L. W. MOFFETT

WASHINGTON, Sept. 26.—Methods of procedure incident to its enlarged powers granted under the Fordney-McCumber act are being worked out by the United States Tariff Commission. Chairman Marvin of the commission said that when the work has been completed, rules and regulations will be made public.

The commission not only is authorized by the new act to make broader investigations than heretofore regarding the costs of production in the United States and in foreign countries, but also is authorized to recommend rates. Undoubtedly one of its greatest activities under the new law will be in connection with investigations made at the direction of the President, under authority given him by the flexible tariff section. This permits the President of his own volition to increase or decrease rates by not more or less than 50 per cent. Chairman Marvin has said that because of the added work conferred upon it, the commission's forces of experts must be tripled in size. The chairman called at the White House last Wednesday and informed President Harding of this fact. He also told the President that increased appropriations will be needed by the commission. Apparently this is one problem which was not given much consideration by Congress during its discussion of the tariff.

The President's Comment

The new tariff law went into effect at midnight, Sept. 21. The President signed the measure in the morning of that day. That the President looks to the flexible tariff provision as a real constructive force in fixing duties is indicated by the statement he made when he signed the tariff. He declared that "if we succeed, as I hope we will succeed, in making effective the elastic provisions of this bill, this will prove the greatest contribution toward progress in tariff making in a century."

Because of the increased powers given to the Tariff Commission, its rank has quite appropriately been compared with that of the Interstate Commerce Commission. The Tariff Commission undoubtedly from now on will be a more vital force in connection with the fixing of tariff rates. It is confidently believed that recommendations it makes based upon its investigations will be given much weight. Under its new powers it will report findings with recommendations regarding rates on the basis of valuation, American or foreign, to the President, when the latter seeks to make changes under the elastic provisions. Manufacturers, importers, or consumers making application for changes in rates, or in the basis of valuation may do so either directly to the President or to the Tariff Commission, but in any event changes will be preceded by an investigation and probably hearings, conducted by the Tariff Commission, to which all applications will be referred.

Cannot Change Free List

Inasmuch as the act prohibits the President from transferring articles on the free list, to the dutiable and vice versa, iron and steel manufacturers, for instance, will be unable to have certain raw products which they use placed on the free list for which they have contended. Among these products are manganese ore, ferromanganese and fluorspar. The President could, however, reduce duties on these products 50 per cent, regardless of whether or not they are fixed on an ad valorem or specific basis, although, as it happens, all of them carry specific duties. The President cannot, however, change rates from a specific to an ad valorem basis or from an ad valorem to a specific basis. This means, therefore, that the lowest possible duty the iron and steel interests could have fixed on manganese ore would be ½c. per lb. on the manganese contents, inasmuch as the duty is 1c. per lb., and the ferromanganese duty could not be reduced more than 50 per cent of the duty of 1⅞c. per lb. or .9375c. per lb. on the ferromanganese content, with more than 1 per cent of carbon, such as is used by the industry.

Comparison of Tariff Rates

	Fordney-McCumber Act	*Underwood-Simmons Act*	*Payne-Aldrich Act*
Iron ore	Free	Free	Free
Pig iron	75c. ton	Free	$2.50 ton
Scrap	75c. ton	Free	$1 ton
Scrap tin plate	Free		
Spiegeleisen	75c. ton when more than 1 per cent carbon and less than 30 per cent Mn.	Free	$2.50 ton
Ferromanganese	1⅞c. per lb. when more than 1 per cent carbon and 30 per cent or more Mn.	Free	$2.50 ton
Manganese ore	1c. lb. Mn. content	Free	Free
Ferrosilicon (on silicon content)	2c. lb.; 8 to 60 per cent 3c. lb.; 60 to 80 per cent 4c. lb.; 80 to 90 per cent 8c. lb.; 90 per cent or more	15 per cent	20 to 25 per cent
Molybdenum ore (on metallic molybdenum content)	35c. per lb.	Free	Free
Tungsten ore (on metallic tungsten)	45c. lb.	Free	10 per cent
Ferromolybdenum (on molybdenum)	50c. lb. and 15 per cent ad valorem	15 per cent	20 to 25 per cent
Ferrotungsten, metallic tungsten and compounds (on tungsten)	60c. lb. and 25 per cent ad valorem	15 per cent	20 to 25 per cent
Ferrochromium tungsten, chromium tungsten, chromium cobalt tungsten, tungsten nickel and other alloys of tungsten not provided for	60c. lb. and 25 per cent ad valorem	15 per cent	20 to 25 per cent
Ferrochrome, 3 per cent or more carbon (on chromium content)	3½c. lb.	15 per cent	20 to 25 per cent
Ferrochrome, less than 3 per cent carbon and chrome metal	30 per cent ad valorem	15 per cent	20 to 25 per cent

	Fordney-McCumber Act	Underwood-Simmons Act	Payne-Aldrich Act
Steel ingots, blooms, slabs, billets, iron-molded steel castings, sheets and plates not specially provided for, value not over		Ingots, etc., by Bessemer or open-hearth process, free; electric or crucible, 15 per cent	Ranged from 7/40c. to 7c. lb. and 20 per cent ad valorem
1c. lb.	2/10c. lb.		
1c. to 1½c. lb.	3/10c. lb.		
1½c. to 2½c. lb.	5/10c. lb.		
2½c. to 3½c. lb.	8/10c. lb.		
3½c. to 5c. lb.	1c. lb.		
5c. to 8c. lb.	1 7/10c. lb.		
8c. to 12c. lb.	2½c. lb.		
12c. to 16c. lb.	3½c. lb.		
Above 16c. lb.	20 per cent ad valorem		
Circular saw plates	Additional duty of ¼c. lb.		
Boiler or other plate iron or steel, except crucible plate steel and saw plate steel, not thinner than 109/1000 in., and skelp valued at			
1c. lb. or less	7/20c. lb.	12 per cent	20 per cent
1c. to 3c. lb.	5/10c. lb.	12 per cent	20 per cent
Over 3c. lb.	20 per cent	12 per cent	20 per cent
Black iron and steel sheets, skelp iron or steel valued 3c. lb. or less:			
Thinner than 109/1000 in.	45/100c. lb.		
Thinner than 38/1000 in. to 22/1000 in.	55/100c. lb.		
Thinner than 22/1000 in.	75/100c. lb.		
Thinner than 10/1000 in.	85/100c. lb.		
Corrugated or crimped	75/100c. lb.		
Foregoing valued at more than 3c. lb.	20 per cent		
Galvanized sheets, plates, bars (for galvanizing)	2/10c. lb. extra	15 per cent	2/10c. lb. extra
Tin plate and terne plate	1c. lb.		1 2/10c. lb.
Structural, not assembled	½c. lb.	10 per cent	3/10c. to 4/10 c. lb.
Machined and fabricated	20 per cent	10 per cent	45 per cent
Sashes, building forms, etc.	25 per cent		
Hoop, band and scroll iron and steel not specially provided for. Value, 3c. lb. or less, 8/10 in. or less in width, thinner than ⅝ to 109/1000 in. thick	25/100c. lb.	10 per cent	3/10c. lb.
Thinner than 109/1000 to 38/1000 in.	35/100c. lb.	10 per cent	4/10c. lb.
Thinner than 38/1000 in.	55/100c. lb.	10 per cent	6/10c. lb.
Bands and strips not specially provided for, long or short lengths	35 per cent	10 per cent	35 per cent
Cotton ties	¼c. lb.	Free	3/10c. lb.
Wire rods. Value not over 4c. lb.	3/10c. lb.	10 per cent	3/10c. lb.
Value over 4c. lb.	6/10c. lb.	10 per cent	6/10c. lb.
Barbed wire	Free	Free	Free
Round iron or steel wire:			
Not smaller than 95/1000 in. diam.	¾c. lb.		1c. lb.
From 95/1000 to 65/1000 in.	1¼c. lb.		1¼c. lb.
Smaller than 65/1000 in.	1½c. lb.	15 per cent	1¾c. lb.
Galvanized wire (extra)	2/10c. lb.		35 per cent
Iron, steel anchors, iron, steel forgings not machined, tooled, etc.	25 per cent	12 per cent	30 per cent
Ball bearings and rollers	10c. lb. and 55 per cent	35 per cent	45 per cent
Railway fishplates, splice bars	¼c. lb.	10 per cent	3/10c. lb.
Steel rails	1/10c. lb.	Free	7/40c. lb.
Axles, bars, blanks, forgings. Value not over 6c. lb.	6/10c. lb.	10 per cent	¾c. lb.
Cast iron pipe	20 per cent	10 per cent	¼c. lb.
Lap and butt weld pipe, tubes, etc., not thinner than 65/1000 in.:			
Not less than ⅝ in. diam.	¾c. lb.		1c. lb.
Less than ⅝ to ¼ in.	1¼c. lb.	20 per cent	1½c. lb.
Less than ¼ in.	1¾c. lb.		2c. lb.
Iron and steel chain not less than ¾ in. diam.	7/8c. lb.		⅞c. lb.
Less than ¾ to ⅜ in.	1½c. lb.	25 per cent	1⅛c. lb.
Less than ⅜ to ⅞ in.	1¾c. lb.		1 6/8c. lb.
Less than ⅞ in.	3c. lb.		3c. lb.
Nuts, washers of wrought iron, steel	6/10c. lb.	5 per cent	¾c. lb.
Bolts and bolt blanks	1c. lb.	10 per cent	1⅛c. lb.
Cut nails and spikes:			
Over 2 in. long	4/10c. lb.	Free	4/10c. lb.
Not exceeding 2 in., including tacks	15 per cent		
Rivets, studs, etc.	30 per cent	20 per cent	45 per cent
Steel wool	10c. lb. and 30 per cent	20 per cent	40 per cent
Machine tools and parts	30 per cent	15 per cent	30 per cent
Aluminum, scrap and alloys	5c. lb.	2c. lb.	7c. lb.
Aluminum plates, rods, etc.	9c. lb.	3½c. lb.	11c. lb.
Copper in rolls, rods, sheets	2½c. lb.	5 per cent	2½c. lb.
Brass rods, sheets, plates, etc.	4c. lb.	20 per cent	45 per cent
Tin in bars, blocks or pigs	Free	Free	Free
Lead-bearing ores	1½c. lb. lead content	¾c. lb.	1½c. lb. lead cont.
Zinc-bearing ore:		Free	Free
Less than 10 per cent zinc	Free		¼c. lb. zinc cont.
From 10 to 20 per cent zinc	½c. lb. zinc content		½c. lb. zinc. cont.
From 20 to 25 per cent zinc	1c. lb. zinc content		1c. lb. zinc. cont.
Over 25 per cent zinc	1½c. lb. zinc content		
Magnesite, crude	⅛c. lb.	Free	Free
Dead burned	23/40c. lb.	Free	Free
Fluorspar	$5.60 ton	Free	$3 ton
Graphite, crude or refined:			
Amorphous	10 per cent	Free	Free
Crystalline lump, chip, dust	20 per cent		
Crystalline flake	1½c. lb.		

Fordney-McCumber Tariff Is Approved

Iron and Steel Manufacturers Indorse Most of the Metal Rates and Hope for Good Results from Power to Change Given the President

THE sentiment of iron and steel manufacturers in regard to the Fordney-McCumber tariff act as expressed to representatives of THE IRON AGE in leading centers is on the whole one of mild approval. The flexible feature of the tariff, which gives the President authority to change rates under certain conditions, is regarded with favor by nearly all who have expressed an opinion, but some do not take it seriously and regard it as merely an effort to appease those who were dissatisfied with some of the schedules. Ferromanganese manufacturers are not satisfied with the bill and may appeal to the President. The duties on pig iron, steel products and scrap are not expected to have any important effect on business, but some of them will yield a fair revenue to the Government.

The attitude of many approaches indifference and is in striking contrast with that of the excitement which accompanied the enactment of some of the tariff bills of past years.

Most Pittsburgh Manufacturers Satisfied

PITTSBURGH, Sept. 25.—While sentiment with regard to the effect of the new tariff upon the iron, steel and machinery industries varies, it is commonly agreed that the new schedules compensate American manufacturers for the difference between American and foreign costs and most of the trade is satisfied. It is recognized that export business will suffer through the inability of European countries to pay for purchases in cash, and the fact that the new import duties will largely prevent payments with goods. Payment of the funded and unfunded war debt of European nations is paramount with large Eastern bankers who have become international in their viewpoint and naturally condemn the tariff on the ground that it will delay, if not entirely prevent, the payment of the debt. This, however, is not the view of the iron and steel industry, which as a whole takes the view that if payment of the debt is to be possible through paralysis of American industry, it is better that the debt remain unpaid.

It is pointed out that the export business for some months has been declining and leading manufacturers take the position that domestic requirements will absorb the full production that is possible to attain so long as the immigration laws prevent a full labor supply. It has been estimated that the world's requirements of steel annually for the next few years will average about 100,000,000 tons and that, in spite of the tariff, American manufacturers must be called upon to supply a considerable part of this tonnage. The fact that the President is given considerable latitude in changing schedules that might prove oppressive, to one industry or another, is regarded as favorable and some believe it is the forerunner of taking the entire matter of tariff making out of the hands of Congress and placing it with a commission, which would function along the line of the Interstate Commerce Commission. It is this provision of the new law which prompts the steel industry to accept gracefully the imposition of duties on the raw materials it uses. Many steel manufacturers do not like the duty on manganese ore, ferromanganese and other ferroalloys, but take comfort from the fact that an investigation of the whole matter can be had and if the import duties are found to be oppressive they can be lowered.

A leading manufacturer of tool steel believes that the tariff is fair, in that it bridges the gap between producing costs here and those abroad. Since the American industry started making tool and high-speed steel containing tungsten and other alloys, competition from abroad has been confined largely to carbon steels. Some foreign steel will continue to come in, it is declared, but the present status of the industry is that it is in the hands of American producers and will remain so.

The duties on foreign machine tools is not expected to have much effect one way or another. European manufacturers some time ago lost on the struggle for supremacy in American markets because of the superiority of the American products.

Ferromanganese Manufacturers Are Not Satisfied

NEW YORK, Sept. 26.—Calculated on the basis of 50 units of manganese per ton of manganese ore, the duty on imported ore under the new tariff act is $11.20 per ton. As it requires from two to two and a fifth tons of ore to make one ton of 80 per cent ferromanganese, the American producer of ferromanganese will pay from $24.60 to $28 duty on the material for a ton of ferromanganese. In return the American producer is protected to the extent of 1⅞c. per lb. of contained manganese in the ferromanganese. The duty, therefore, on imported ferromanganese of 80 per cent grade is $33.60 per ton. The American ferromanganese manufacturers figure their advantage on an average of $8 a ton. As their request was for a protection of at least 25 per cent on ferromanganese with ore admitted free of duty, the Fordney-McCumber bill provisions do not entirely satisfy them. Some steel manufacturers claim that a margin of $6 would have afforded ample protection to the domestic ferromanganese industry.

Little Interest at Cleveland

CLEVELAND, Sept. 25.—Iron, steel and machinery manufacturers in this city show very little interest in the Fordney-McCumber tariff. Few have given the tariff law sufficient study to comment either favorably or unfavorably on its provisions that affect their industries. Pig iron producers say that while the tariff on pig iron is a protection to Eastern blast furnaces it will have very little effect on Central Western furnaces. Generally, steel producers do not see that the tariff will have any appreciable effect on their business. Machine tool manufacturers also show a lack of interest in the new tariff, as they have little foreign competition. Comment on the provision permitting a revision of rates is generally favorable.

May Ask Reduction in Raw Materials

YOUNGSTOWN, Sept. 25.—Belief prevails that a formal complaint will be entered by iron and steel interests against duties imposed on such raw materials as ferromanganese, magnesite, ferrosilicon and manganese ore by the Fordney-McCumber act. It is yet too early for concerted action, as tariff provisions are just now being digested. District interests feel that a duty of $6 on 80 per cent ferromanganese would have been ample.

It is the impression that the tariff on rolled steel products affords ample protection for the American steel industry.

The theory of the leading district interest is that

products mined from the ground or coming under general classification of natural resources should carry only such a duty as will provide for the difference in labor costs in Europe and America of preparing such materials for marketing. Export trade has been of diminishing proportions for some time, and the tariff is not expected to exert any influence in that direction.

Michigan Will Be Benefited

DETROIT, Sept. 23.—Detroit and Michigan will not be vitally affected by the tariff revision in its relation to iron, steel and machinery. Exports are in excess of imports through Detroit, Port Huron and Sault Saint Marie, which are the principal ports of entry for Michigan. So far as pig iron is concerned, the situation is somewhat complicated. A number of melters along the border have been accustomed to purchase their iron requirements on the American side, although for a time during the early part of this year when iron was selling appreciably below furnace costs, this movement was interfered with through the enforcement of the Canadian anti-dumping law. On the other hand, considerable Canadian iron moves with more or less regularity into northern and western Michigan, taking advantage of the relatively high freight rates to melting points in this district from the nearest American producing points. With iron at its present level, the Fordney-McCumber tariff of 75c. per ton is not likely to prove much of a deterrent factor. At times, substantial tonnages of steel rails have been sold to Michigan roads by the Algoma Steel Co. from its plant at Sault Ste. Marie, Ontario.

The automotive industry, from the expert standpoint, will be stimulated, due to the reciprocal provisions of the tariff act and as this industry stands foremost in Michigan, the State as a whole will be benefited by this legislation.

The New Tariff on Machine Tools

NEW YORK, Sept. 25.—The advance in the duty on machine tools from 15 (Underwood tariff) to 30 per cent, provided for in the new tariff bill, is not seriously regarded by the few American importers who are bringing foreign-made machine tools into this country. There was no rush to bring foreign machine tools into the United States immediately preceding the enactment of the tariff bill, as is evidenced by the official statistics of the Department of Commerce, which show that only 84 tools came in during July, as compared with 89 in July, 1921. During the seven months ended July 31, the United States imported 922 machine tools of various classifications, having a declared value of $127,594, and of these a considerable part were plate fabricating machines, such as punches, shears, bending rolls, riveting machines, etc.

Henry Pels & Co., 90 West Street, who have been importing German-made plate fabricating machines, say that they have a small stock, such as they usually carry, but have not made any unusual purchases abroad in order to bring machines in prior to the time that the new tariff went into effect.

Varied Comment at Cincinnati

CINCINNATI, Sept. 25.—The passing of the Fordney-McCumber tariff bill was rather unexpected by manufacturers in Cincinnati and vicinity. The opinion seemed to be general that the bill would be left over until next session. The sentiment in the iron trade appears to be favorable to its passage, at least in part, opinions being expressed that the import duties will react to the benefit of this country by stimulating the production of ferroalloys particularly. The bill is considered to be only a tentative one, and many in the trade are of the opinion that many changes will be made in it at the next session.

The machinery manufacturers of the district are satisfied with the bill, though they have up to the present time manifested little interest in it. Sentiment among manufacturers is that the tariff bill will have little effect on their business, either domestic or export. This is particularly true at the present time, when conditions are bad, but even with a return to prosperity in foreign countries, local manufacturers of machine tools do not believe that the bill will affect their interests. So long as the American manufacturers of machine tools maintain their high standards, little fear is expressed that American machinery will be unable to compete in world markets, regardless of retaliatory tariffs that may be put into effect by other countries.

The sentiment among iron and steel men appears to be that a more thorough investigation of the conditions now existing should be made by the Tariff Commission, particularly as to the duties on raw materials, which are considered excessive, and which should, they believe, be reduced by Presidential proclamation.

Not Regarded as Protective

BOSTON, Sept. 25.—The consensus of opinion among melters and importers is that the new tariff affords no protection under existing conditions to the American furnace. The importation of iron is due entirely to an emergency and is made possible by its cost at the furnace. The duty of 75c. a ton at the moment therefore penalizes New England foundries without affording protection to the domestic furnace. But because of the disparity of foreign and domestic iron prices laid down in the foundry yard, this penalization is unoffensive. Until foreign furnaces stop selling iron at a loss and until production costs of furnaces on this side of the water are reduced, will the new tariff give protection.

Presidential Provision Indorsed in the South

BIRMINGHAM, ALA., Sept. 25.—Iron and steel operators of the Birmingham district, while inclined to believe that the Fordney-McCumber tariff has gone too far in the way of protection are inclined to view with favor the provision allowing the President from time to time to determine flexible rates and thus remove the oppressive features of the tariff as they reveal themselves. There was not a man, Republican or Democrat, who did not applaud that provision as stressed by Morris W. Bush, president Shelby Iron Co. They claim that this is a step in the direction of a business tariff and they believe that exercise of the Presidential privilege will tend to create more approval than the new tariff would receive without this flexible feature. Some are disappointed in the failure to have ad valorem basis fixed on domestic valuations.

Refractories Statistics

Shipments of fire clay brick in August, as reported by members of the Refractories Manufacturers' Association, were approximately 62 per cent of monthly economical producing capacity. This is a gain of about 4 per cent over the July shipments, but as there was an even greater gain in production, which rose from about 60 per cent in July to about 66 per cent in August, stocks rose to the highest point on record, standing as of Aug. 31 at 207 per cent, a gain of 6 per cent over a month before. New orders declined in August about 2 per cent, but unfilled orders gained about 7 per cent.

The slant of both production and shipments of silica brick was down in August, but as shipments were at the rate of 42 per cent of economical producing capacity and production was about 37 per cent, and cancellations were nil, stocks dropped to about 131 per cent of capacity as compared with 137 per cent in July. The loss in shipments in August as compared with July was 4 per cent, but that in production also was 4 per cent, while in July cancellations were 4 per cent as against none in August. New orders in August had a steep decline, dropping from 51 per cent to 39 per cent. Unfilled orders dropped about 3 per cent, standing at 72 per cent as of Aug. 31.

Comprehensive Exhibit of Machine Tools

New Haven Branch of American Society of Mechanical Engineers Sponsors Show and Meeting, Which Are Largely Attended

THE second annual machine tool exhibition in New Haven, Conn., was held Sept. 21 to 23 under the joint auspices of the New Haven branch, American Society of Mechanical Engineers, the Sheffield Scientific School of Yale University and the New Haven Chamber of Commerce in the Mason Laboratory of Mechanical Engineering of Yale University. Kenneth F. Lees, New Haven branch, American Society of Mechanical Engineers, was chairman of the executive committee and H. R. Westcott, of Westcott & Mapes, New Haven, was chairman of the exhibition committee.

The growth in number of exhibitors and scope of exhibits this year, as compared with last, was gratifying to those responsible for the undertaking and would appear to indicate its distinct value and promise of future growth. The attendance on all three days was large, at times somewhat cramping the space. Many exhibitors reported orders taken for their products.

Co-operation Between College and Machine Industry

The program was formally opened by Mr. Lees on Thursday evening, introducing Prof. L. P. Breckenridge of Yale University as chairman. The first address was by Dean Charles H. Warren, of the Sheffield Scientific School, on "Cooperation Between Colleges and the Machine Tool Industry." Professor Warren likened the mechanical engineering department of the university to a manufacturing concern. It has its raw material, the rawness varying with the individual boy, to be worked into a product to be delivered to the great consuming public. The problems confronting the faculty of such a school can best be solved by a hearty co-operation between the teachers, in this case the producers, and the manufacturers, or the consumers of the product.

Complementing the laboratory equipment, which illustrates fundamental principles and typical machines studied by the boys, there are now side trips, he said, into various manufacturing plants to study the more complicated machinery in actual use. This method shows the students the actual meeting place of theory and practice. To supplement the theory learned by students in the mechanical courses, the cooperation between the university and the manufacturers should be carried further, he added. A plan suggested was permission for students to work in the various plants during vacation periods and thereby gain actual experience and permit manufacturers to study their qualifications as possible future executives. Another plan for cooperation is the broader use of the university's research laboratories and the talents and acquirements of its staff. This would help the manufacturer and the students as the latter would then come in contact through their professors with actual problems and their solution. In some cases it might be possible for selected groups of advanced students to be put at work upon these problems, perhaps in the plants.

Another manner in which the university might help the manufacturer would be for its staff to assist in plans for the development of the schools operated by some manufacturers for the education of their operatives. Professor Warren informed the meeting that Professor Breckenridge of the university would undoubtedly be glad to help in working out some practicable schemes of co-operation.

Henry B. Sargent presented the greetings of the New Haven Chamber of Commerce to the machinery manufacturers. He gave an illustration of the manner in which the installation of American machinery in one class of factories in England was effective both in raising wages and increasing the profits of the manufacturers.

Governor Hartness on Country's Problems

The closing address was by Governor James Hartness of Vermont, who is president of the Jones & Lamson Machine Co., on "The Influence of the Machine Tool in America." Governor Hartness emphasized the importance of the machine tool as the father of machinery in extending the efforts of man in amplifying the product that he could turn out. We are now learning that our whole scheme of management of industrial affairs, financial affairs, business affairs, fails to keep pace with the development of the world as it has grown under the work of the machine tool and its products. Our government, which originally related to maintaining peace within the State and uniting us against a foreign enemy, is trying to handle the matters of business, matters of engineers, matters of farming, matters of finance with men elected to office by the popular ballot. You can not conceive of any quicker way to wreck a commercial company, he said, than to put it in the hands of men elected by that process.

We know, he continued, that one of the greatest misfortunes to our country is the interruption of work by strikes, which are the result of conditions that should not exist. In some cases the men strike for a fair wage, which they should get without striking. On the other hand, men sometimes strike for more than a fair wage, because they have been led to believe that they are entitled to more and that the larger portion is their just due. We will not get any settlement equitably without fighting unless some other means are devised for so doing.

Arbitrators Considering Strictly Economic Laws

There is a way to devise this means, he asserted, through our representative form of government. Our representatives are ready to give what the public demands. They must see the light, but first of all the light must be seen by all people. Every worker in every division must first know that strikes and other interruptions of our production are so harmful to the country that there is less value to be divided. We must go back to the commission type of arbitration, which has failed in the past, but need not be a failure in the future. Our laws would have gone wrong if it were not for our constitution. Arbitration commissions must be backed by a scheme which will start such boards not only composed of impartial members, but have back of them the power that holds them strictly to the letter of economic laws as applicable to our industrial life to-day.

We would then have a board that would say whether the miner was getting more than his share, or the bootmaker, or this or that. There would be taken into account the energy and initiative of invention as applied to business matters as well as machine design and all those things that count for progress. There would be taken into account the spirit of the organization, the spirit of the management. There would be valued all those things that are valued to-day. Manufacturers and others would still have a chance to bring in large money returns into the business and build it up if it is for the welfare of the country.

The machine tool that has built up this wonderful world of mechanism has built up something that will tread all over us. We will be strangled by interruption of our transportation and unless we use a small part of our brain area for adjusting this matter on lines different from any that are functioning at the present time, it will go very bad for civilization; it will

go very bad for America, especially if Germany or some other country is working truer to the laws of human industrial economics.

Friday and Saturday programs included moving pictures, showing the manufacture of various products. There were also addresses on precision, standardization, production, etc.

LIST OF EXHIBITORS

Abrasive Machine Tool Co.
Acme Wire Co.
Alexander Brothers
American Art Works
American Milling Machine Co.
American Swiss File & Tool Co.
Ames, B. C., Co.
Anderson Machine Co.
Athol Machine Co.
Atkins, E. C., & Co.

Besley, Chas. H., Co.
Bickford-Switzer Co.
Billings & Spencer Co.
Bilton Machine Co.
Bliss Co., E. W.
Bonner & Barnwell
Brown & Sharpe Mfg. Co.
Builders Iron Foundry

Campbell, Andrew Co., Inc.
Callophone Co.
Carborundum Co.
Card Tap & Die Co.
Cincinnati Electrical Tool Co.
Clipper Belt Lacer Co.
Cochrane & Bly Co.
Cronin-Waddell

Deseau, Maurice S.
Detroit Belt Lacer Co.
Detroit Twist Drill Co.
Diamond Machine Co.
Dick, R. J.
Dodge Sales & Engineering Co.

Eastern Machinery Co.
Eastern Machine Screw Co.
Eastern Sales Co.
Educational Exhibition Co.
Electric Alloy Steel Co.

Fafnir Bearing Co.

General Electric Co.
Geometric Tool Co.
Grant Mfg. Co.
Greenfield Tap & Die Corporation.

Hanson - Whitney Machine Co.
Hartford Mill Supply Co.
Hartford Special Machine Co.
Haynes-Stellite Co.
Hergl Mfg. Co.
Hill, Clarke & Co., Inc.
Hobbs, Clinton E.
Hoggson & Pettis Co.
Horton & Son Co., E.

Imperial Belting Co.

Jacobs Mfg. Co.
Johansson, C. E., Inc.
Johnson Belting Co.
Jones & Lamson Machine Co.

Kearney & Trecker Corporation
Keller Mechanical Engraving Co.
Kilborn & Bishop
Kingsbury Mfg. Co.

Leland-Gifford Co.
Lucas, J. L., & Son, Inc.

Madden & Morrison
Manning Abrasive Co.
Mantle & Co.
Martin Machine Co.
Meriden Press & Drop Co.
Monarch Machine Tool Co.

National Acme Co.
New Departure Mfg. Co.
New Haven Electric Co.
New Haven Gas Light Co.
Ney Co., J. M.
Noble & Westbrook Co.
Norwalk Iron Works

Oven Equipment Co.

Page, Steel & Flagg
Peerless Surfacing Machine Co.
Plant, J. D.
Pratt & Whitney Co.
Purinton & Smith

Reed Prentice Co.
Rhodes Mfg. Co.
Rivett Lathe & Grinder Co.
Royal Waste Co.
Royersford Machine Tool Co.

Sellew Machine Tool Co.
Seneca Falls Mfg. Co.
Sidney Machine Tool Co.
Simmonds Mfg. Co.
S. K. F. Industries, Inc.
Skinner Chuck Co.
Slocomb, J. T., Co.
Standard Machinery Co.
Standard Safety Mfg. Co.
Standard Shop Equipment Co.
Standard Steel & Bearings Co. (Philadelphia)
Standard Steel & Bearings Co. (Plainville)
Stark Tool Co.
Starrett Co., L. S.

Taft Peirce Co.
Taylor & Fenn Co.
Thompson, H. G., & Sons Co.
Torrington Co., The
Triangle Tool Co.

Union Twist Drill Co.
Universal Boring Machine Co.

Van Norman Machine Co.
Vitrified Wheel Co.

Wallace, J. D.
Walls Sales Corporation
Walworth Mfg. Co.
Warner & Swasey Co.
Way, A. F., Co.
Welch, J. T.
Wescott & Mapes, Inc.
Whitney Mfg. Co.
Wisconsin Electric Co.
Wright Mfg. Co.

Blind Man Operates Power Press

Probably the most unique exhibit was by the Standard Safety Mfg. Co., New Haven, Conn. This showed a Bliss inclinable power press on which was mounted a Kartzmark safety guard. The press was operated by a blind man, 67 years of age, who had never seen a press, having been blind from his tenth year. A week before the exhibition was his first experience on a press. This demonstration showed conclusively the safety of the guard.

The Kingsbury Mfg. Co., Keene, N. H., showed a two-spindle bench type vertical drill and a single spindle horizontal bench type drill. Both of these machines were equipped with a frictional spindle control with adjustable gravity feed. With this device the drill feed is automatically adjusted to the maximum that the cutting capacity of the drill and the material worked will permit. Machines will stop automatically when the drill dulls.

The Martin Machine Co., Turners Falls, Mass., exhibited its standard hydraulic principle marking machine. Pressure of the work against the die is maintained in this machine by a rotary pump, pumping oil to pressure. The machine will produce uniform depth of impression on work varying in thickness.

A. F. Way Co., Hartford Conn., exhibited its portable electric drill which is rated at ⅝ in. capacity, but will stand a heavy overload; the motor built for this company by General Electric Co. appears to be nonstallable. The drill was shown mounted on a cleverly designed "old-man" and was arranged with screw feed having a capstan hand wheel.

Billings & Spencer Co., Hartford, Conn., showed two die milling machines—one a vertical spindle machine with ball bearing spindle mounted in the base. Blanking and trimming dies are held in a chuck or clamp which is bolted to the top slide. The latter has horizontal travel and is mounted on a lower slide which has transverse travel. Travel in either direction is controlled by conveniently placed handwheels. The cutter is held in a chuck of the collet type. The other machine shown by Billings & Spencer was a die sinking machine of the vertical type. This machine has ball bearing spindle similar to that in the machine described. A clutch is provided for starting and stopping without shifting the belt. The amount of power delivered to the cutter is variable. This feature is obtained by a friction device incorporated in the belt shifter, permitting the belt to ride partly on the tight and partly on the loose pulley, thereby accommodating the amount of power to the size of the cutter.

A Nibbling Machine

Andrew C. Campbell, Waterbury, Conn., exhibited the Campbell patent nibbling machine. This machine is designed to take the place of the ordinary circle shear, but has capacity for handling a much wider variety of work than is possible in that type of machine. It can also be used to take the place of other types of machines for cutting sheets or light plates. The operating portion of the machine consists of an overhanging arm carrying a rapidly reciprocating punch of small size. The feed is governed by a small stop pin on the extreme end of the punch. The metal is fed against the pin, thus allowing a small portion of stock to be removed with each stroke of the punch. The work is fed toward the cutter and can be guided to follow any shape or design which may be laid out on the sheet. The machine is rapid and throws no burr, but leaves the work entirely flat.

A vise for holding irregularly shaped work was shown by Mantle & Co., New York. The jaws of this vise consist of a series of blocks, reducing in size toward the center of the vise. These blocks consist of segments of a circle, each segment carrying two similar segments of smaller size. Each jaw consists of a total of fifteen of the blocks. It can be readily seen that by an arrangement of this kind the jaws of the vise will accommodate themselves to hold a piece of practically any shape. The base of the vise is of the swivel type.

A motor-driven tap grinder was exhibited by the Bickford-Switzer Co., Greenfield, Mass. This machine is used for grinding the cutting edges of taps, reamers, etc., giving assurance that all flutes will do an equal amount of cutting. The machine will handle tools having from two to six flutes.

The Ready Tool Co., Bridgeport, Conn., in addition to its regular line of tool holders, milling machine dogs, etc., exhibited a line of high-speed steel lathe centers. These lathe centers are made of "Hy-Ten" steel with a high-speed steel point, electrically welded to it, before grinding.

A similar center was exhibited by the Haynes-Stellite Co., Kokomo, Ind., except that the point welded to the "Hy-Ten" steel was of stellite rather than high-speed steel.

A fast-working machine for grinding pulleys from the rough, producing convex, flat or concave surfaces, was shown by the Diamond Machine Co., Providence. The grinding wheel employed is a ring wheel car-

ried in a heavy chuck, the work being mounted on an arbor in front of the wheel.

Centering Machine Attracts Attention

Much attention was attracted by the exhibit of the Hanson-Whitney Machine Co., Hartford, and the Hartford Tap & Gage Co. One of the machines shown by Hanson-Whitney was a centering machine which is of the lathe type and revolves the work to be centered. The spindle of the machine carries a triple left-hand thread chuck so that the work is simply pushed into the chuck and is immediately held, the other end resting on a roller steady rest. The tool carriage is controlled by one lever, but has two independent slides, one carrying a centering drill and the other slide carrying a shaving tool for trimming the end of the work. A dial carrying both metric and English measurements is provided for setting the adjustment of the roller rest for the proper diameter of work. Oil is delivered to the tools under pressure. The machine is of the single pulley drive type with a brake for instant stopping of the spindle.

The Meriden Press & Drop Co., Meriden, Conn., showed different sizes of a ball bearing polishing lathe recently brought out.

The motor-driven emery stand shown by the Diamond Machine Co., Providence, is different from the usual design of such machines in that the motor is manufactured by S. A. Woods Machine Co. The reason for their having selected this motor is that it is an induction motor with provision for cooling in the center of the frame. It is of the inclosed type without being large in size. That part of the motor directly near the grinding wheels is protected from the collection of dirt. The grinding machine is provided with wheel hoods which are adjustable to accommodate for wear in the diameter of the wheel.

Leland-Gifford Co., Worcester, Mass., showed two sizes of high-speed ball bearing drills, two spindle type. The smaller of these machines, capable of running at high speeds for drilling small holes, is equipped with an automatic feed device in connection with its power feed, permitting it to be set for continuous drilling. This machine is also equipped with a high speed tapping attachment. The larger machine shown was the heavy type, fitted on one spindle with tapping device and on the other spindle with power feed.

An automatic portable arc welder was shown by the General Electric Co., Schenectady, N. Y. This machine allows for repairing defective work at any place in the shop, even to the point of filling blow holes, etc., which may be discovered in the process of machining.

The General Electric Co. also showed a model in four parts, showing the faults of improper lighting due to poor voltage or too high wattage as compared with lighting by properly planned illumination. Also, in this model, was brought out the advantages from the light standpoint of motor-driven equipment as compared with belt-driven.

Many of the machines mentioned in the foregoing have been described at different times in THE IRON AGE.

NEW EXPORT COMPANY

Bethlehem Will Handle Its Own Products—Consolidated Stops Selling

The Bethlehem Steel Export Corporation has filed an application for a charter with the Secretary of State of Delaware. The company will handle the export business of the Bethlehem Steel Corporation, previously taken care of by the Consolidated Steel Corporation. The new corporation will have a capitalization of $1,000,000. The North American Steel Co., which is to take over the Midvale, Republic and Inland Steel companies, may also form its own export company.

E. A. S. Clarke, president Consolidated Steel Corporation, has issued the following statement: "Consolidated Steel Corporation has ceased selling, and will liquidate its affairs as rapidly as consistent with conditions. The member companies are now quoting directly for their own account for export. Liquidation, naturally, involves drastic reduction of personnel. The directors may later consider a modified plan which will enable them to avail of the provisions of the Webb law."

Steel Bounties Aid Japanese Merchant Marine

While the Japanese shipbuilding bounty law of 1896 was suspended in 1918, the work which it was designed to accomplish is being carried forward by a law dated August, 1917, for the encouragement of the steel industry. This exempts from income taxes and business taxes all those engaged in the steel industries and provides bounties for various domestic steel products. This system resulted, by 1921, in providing a domestic production of steel equal in volume to the amount of the imports.

Since July 20, 1921, the law encouraging the steel industry has been amended so that the bounties apply only to steel products used in building or repairing naval vessels or merchant ships. A bounty is provided for steel ingots and slabs made in Japan, equal to 12 per cent of the value of imported steel ingots and slabs, and a further bounty of 15 per cent of the value of the imported article in the case of bars, rods, shapes, T-shapes, angles, ship plates, sheets, tubes, pipes and turbine blades made in Japan. These bounties are paid only when the articles are used in the shipyards.

Navigation bounties, in addition to the direct shipping and steel bounties, have been a further air in developing a merchant marine which has grow tremendously in the past dozen years. These bounties are increased heavily in the case of vessels built according to the specifications of the Japanese government, particularly with regard to the possibility of converting the vessels in time of emergency to naval use.

Swedish Business Generally Dull

Cable advices to the Department of Commerce indicate that general business in Sweden is dull. The situation in the iron and steel industry is unsatisfactory. Production was poor during the first 7 months of 1922. The export of iron ore during the first six months of this year came to 2,600,000 tons as compared with 2,100,000 tons for the first six months of 1921. Blast furnaces are operating at a capacity of about 23 per cent of normal and electro-steel furnaces at 24 per cent. There seem to be no signs of an improvement. The machinery industry is depressed owing to general conditions, the loss of the Russian market, and German competition. Six plants have been forced to discontinue operation.

Much British Coal Arriving

Figures compiled by the New York *Herald* show that 26 ships loaded with British coal arrived at New York during the second week of September, compared with 20 ships during the previous week. The tonnage of coal brought in was 160,985 in the second week and 132,878 in the first week of the month. The August total for the port of New York is placed at 275,000 tons, and for all ports at 375,000 tons. It is expected that about 700,000 tons will arrive at all ports during September and many additional shipments are scheduled for arrival in October.

With the appointment of John C. Chandler as manager of the Cleveland district sales office of the Bethlehem Steel Co., the offices of the Lackawanna Steel Co. and Bethlehem Steel Co. have been combined in the latter company's offices in the Guardian Building. Mr. Chandler has been district manager of sales of the Lackawanna Steel Co. in Cleveland for over 12 years.

Prices of Steel Castings Are Advanced

Percentages Vary from 15 to 20—Increased Cost of Raw Materials and Labor Made Action Necessary—Changes in Arrangement of List

STEEL castings have been advanced in varying percentages, averaging from about 15 to 20 per cent, effective Oct. 1. In announcing its new list prices and discounts, the American Steel Foundries states that it was necessary to revise all outstanding discounts because of increased raw material and labor costs. A comparison of the prices of the more important raw materials entering in the production of steel castings shows increases since March, 1922, as follows: 70 per cent for Bessemer pig iron at Pittsburgh, 90 per cent for basic pig iron, f.o.b. Valley furnace, 40 per cent for heavy melting steel scrap at Pittsburgh, 10 to 30 per cent for ferromanganese and ferrosilicon delivered, 45 to 80 per cent on coal delivered and 15 to 25 per cent on stores and other materials delivered. It is also pointed out that costs continue to climb higher every day and it cannot be foreseen how long the new discounts will remain in force. In fact, further advances may prove necessary within the next month or six weeks.

In order to further simplify the plan of list and discounts for steel castings inaugurated by the company early this year, certain changes in the arrangement of the list have been made and the more important classes of castings have been grouped under different sections thereof. The weight divisions are exactly the same as heretofore, excepting in the case of castings weighing less than 10 lb. each. Designs of castings weighing less than this amount are so numerous and the metal sections so variable that it has been found necessary to incorporate prices for the lower weights.

Section A, drawn up on both a division of weight and also on a quantity basis, takes care of all the smaller classes of castings up to 100 lb. each and over. Heretofore several discounts have been made to take care of the prices on increasing quantities of the smaller classes of castings. Now with this revision one discount will take care of each design regardless of what the quantity may be.

Section B, covering rolls and mill pinions for rolling mills obviates the necessity of naming more than one discount on those classes of castings.

Section C, D and E take care of all steel castings used in the construction or repair of a locomotive and simplify the discounts thereon.

Section F covers miscellaneous castings of the most desirable designs, including the general run of miscellaneous castings for heavy machinery, rolling mills, etc.

Section G covers castings of the more intricate designs. Castings of this description slow up production, they call for the use of the highest class of mechanics, special equipment and generally a great deal of attention by the supervisory force.

Discounts as of Oct. 1, 1922, Are as Follows:

Name of Casting:	Discount, Per Cent	Section
Accumulator cylinders:		
With walls over 1½ in. thick and simple flange on one end	47½	G
With walls 1½ in. thick or less and simple flange on one end	42½	G
All other designs	37½	G
Ammonia fittings	Net	F
Annealing bottoms	55	F
Annealing boxes	35	F
Annealing pots	35	F
Anode plates	52½	F
Anvil blocks	45	F
Arms for boiler riveters	Net	F
Ball and socket joints	17½	F
Bars, grizzly	32½	F
Bases, column:		
In lots of 1 to 49 pieces	45	F
In lots of 50 pieces and over	47½	F
Bells for blast furnaces	27½	F
Blades, propeller	47½	G
Blast furnace bells	27½	F
Blast furnace miscellaneous	37½	F
Blocks, anvil	45	F
Blocks, bridge:		
In lots of 1 to 49 pieces	45	F
In lots of 50 pieces and over	47½	F
Blocks, die	40	F
Bodies, valve	17½	F
Boiler riveter arms	Net	F
Boiler saddles	17½	F
Bolster center fillers	35	A
Bosh plates	42½	F
Bottom plates, refractory	22½	F
Bottoms, annealing	55	F
Boxes, annealing	35	F
Boxes, charging	42½	F
Boxes, coupling	45	F
Boxes, journal	*	
Brackets, guide	40	G
Brake wheels, crane	40	G
Bridge blocks:		
In lots of 1 to 49 pieces	45	F
In lots of 50 pieces and over	47½	F
Bridge shoes:		
In lots of 1 to 49 pieces	45	F
In lots of 50 pieces and over	47½	F
Bumper hoods, crane	40	G
Bumper for mine cars	42½	A
Carriages, end for crane	47½	G
Car wheels, mine and industrial:		
Single flange, web plate with plain hub	42½	A
Single flange, spoke center with plain hub	35	A
Irregular design: Self-oilers, special flanges, etc.	27½	A
Casings for centrifugal pumps	*	
Cement mills miscellaneous	22½	F
Cement mill riding rings	50	G
Cement mill rollers	37½	F
Cement mill tires	50	G
Center fillers, bolster	35	A
Center plates	45	A
Center stems	40	G
Centrifugal pump castings	*	
Charging bar supports	40	G
Charging box heads and ends (cored):		
In lots under 100	37½	F
In lots 100 and over	42½	F
Charging box heads and ends (not cored):		
In lots under 100	42½	F
In lots 100 and over	47½	F
Charging boxes	42½	F
Circle plates, refractory	32½	F
Column bases:		
In lots of 1 to 49 pieces	45	F
In lots of 50 pieces and over	47½	F
Column guides for mine cars	27½	A
Columns, truck	35	A
Copper ladles	20	F
Copper mine miscellaneous	27½	F
Copper molds	37½	F
Counter balances	32½	F
Coupler carriers	47½	A
Coupling boxes	45	F
Couplings, sugar mill	42½	F
Covers for crane gears	40	G
Covers, handhole	17½	F
Covers, manhole	17½	F
Cradles for mine cars	27½	A
Crane castings, miscellaneous	27½	F
Crane motor supports	40	G
Crane truck castings	47½	G
Crank discs	32½	F
Crank webs	32½	F
Crossboxes	17½	F
Crossovers	Net	F
Crown wheels for sugar mills	42½	F
Crusher frames, jaw	22½	F
Crusher housings, gyratory	22½	F
Crusher rolls, hollow	37½	G
Cutter heads, dredge	*	
Cylinders, accumulator:		
With walls 1½ in. thick and simple flange on one end	47½	G
With walls 1½ in. thick or less and simple flange on one end	42½	G
All other designs	37½	G
Cylinders, hydraulic press:		
Plain surface with standard rectangular flange	22½	F
Irregular contour, with wings or special cored openings and flanges	12½	F
Die blocks	40	F
Discs, crank	32½	F
Draft lugs (short)	50	A
Drawheads, link and pin	42½	A
Driving wheel centers	37½	D
Dredge cutter heads	*	
Dredge miscellaneous	*	
Dredge piping	17½	F
End carriages, crane	47½	G
Engine castings, miscellaneous	25	F
Engine frames	27½	C
Fittings, ammonia	Net	F

*Discounts on this class of work will be furnished on receipt of inquiry and drawing showing the castings desired.

List Prices for Steel Castings

All prices shown are in dollars per 100 lb.
Extras to be added to net prices and freight allowance are shown below:

Section "A"

Covering castings for freight cars, mine and industrial cars and small castings ordered in quantities of from one to more than 500 pieces from one pattern at one time:

Division of weight:	When ordered in quantities as shown below from one pattern at one time									
	1	2	3-5	6-9	10-24	25-49	50-99	100-249	250-499	500-Over
1-2 lb.	$75.00	$65.60	$56.05	$49.60	$43.15	$37.50	$34.70	$32.35	$30.15	$28.15
Over 2-5 lb.	56.40	49.60	43.65	38.40	33.80	29.75	27.65	25.90	24.25	22.70
Over 5-10 lb.	39.55	35.25	31.45	28.00	25.00	22.25	20.90	19.65	18.50	17.40
Over 10-25 lb.	34.00	30.75	27.65	24.90	22.40	20.20	19.05	18.00	17.05	16.10
Over 25-50 lb.	25.40	23.15	21.05	19.20	17.45	15.90	15.10	14.35	13.65	12.95
Over 50-100 lb.	19.40	17.85	16.45	15.15	13.90	12.80	12.40	11.65	11.15	10.65
Over 100 lb.	16.95	15.75	14.65	13.65	12.70	11.80	11.40	10.90	10.45	10.00

Section "B"

Covering rolls and mill pinions for rolling mills:

Weighing over	250-500	lb. each	$12.80
Weighing over	500-1,000	lb. each	11.50
Weighing over	1,000-2,500	lb. each	9.60
Weighing over	2,500-5,000	lb. each	8.60
Weighing over	5,000-10,000	lb. each	7.20
Weighing over	10,000-50,000	lb. each	6.95
Weighing over	50,000	lb. each	8.15

Section "C"

Covering locomotive frames:

Weighing over	500-1,000	lb. each	$13.65
Weighing over	1,000-2,500	lb. each	11.00
Weighing over	2,500-5,000	lb. each	8.65
Weighing over	5,000	lb. each	8.25

Section "D"

Covering wheel centers for locomotives:

Weighing 1,000 lb. each and under	$9.45
Weighing over 1,000 lb. each	8.80

Section "E"

Covering miscellaneous castings for locomotives:

Weighing 10 lb. each and under			Use Section "A"
Weighing over	10-25	lb. each	$20.20
Weighing over	25-50	lb. each	15.90
Weighing over	50-100	lb. each	12.80
Weighing over	100-250	lb. each	11.80
Weighing over	250-500	lb. each	10.85
Weighing over	500-1,000	lb. each	9.75
Weighing over	1,000	lb. each	9.05

Section "F"

Covering miscellaneous steel castings of simple design:

Weighing over	1-2	lb. each	Use Section "A"
Weighing over	2-5	lb. each	Use Section "A"
Weighing over	5-10	lb. each	Use Section "A"
Weighing over	10-25	lb. each	$20.20
Weighing over	25-50	lb. each	15.90
Weighing over	50-100	lb. each	12.80
Weighing over	100-250	lb. each	11.80
Weighing over	250-500	lb. each	10.85
Weighing over	500-1,000	lb. each	9.75
Weighing over	1,000-2,500	lb. each	9.05
Weighing over	2,500-5,000	lb. each	8.75
Weighing over	5,000-10,000	lb. each	8.40
Weighing over	10,000-50,000	lb. each	8.15
Weighing over	50,000	lb. each	9.50

Section "G"

Covering all other miscellaneous steel castings:

Weighing over	1-2	lb. each	$81.50
Weighing over	2-5	lb. each	67.25
Weighing over	5-10	lb. each	42.75
Weighing over	10-25	lb. each	36.50
Weighing over	25-50	lb. each	28.75
Weighing over	50-100	lb. each	23.25
Weighing over	100-250	lb. each	21.50
Weighing over	250-500	lb. each	19.75
Weighing over	500-1,000	lb. each	18.25
Weighing over	1,000-2,500	lb. each	16.50
Weighing over	2,500-5,000	lb. each	15.75
Weighing over	5,000-10,000	lb. each	15.25
Weighing over	10,000-50,000	lb. each	14.75
Weighing over	50,000	lb. each	17.50

"Extras Per 100 Lb. to Be Added to Net Prices Are as Follows:

For carbon 0.50 to 0.70	Add	$0.25
For carbon 0.70 to 1.00	Add	.50
For carbon 1.00 to 1.25	Add	.75
For carbon 1.25 to 1.50	Add	1.00
For carbon 1.50 and over	Add	1.75
For 2½ to 3½ per cent nickel	Add	2.75
For 0.18 vanadium	Add	2.80
For 1 per cent chrome	Add	1.00
For 1 per cent chrome and 2 per cent nickel	Add	2.50
For 1 per cent chrome and 0.18 vanadium	Add	3.80
For steam test on any casting	Add	.25
For all castings with water circulating pipes	Add	20%

Freight Allowance

The prices obtained after applying the discounts cover the castings in the rough, f.o.b. works, with published rate of freight allowed to the freight station of the purchaser, other than railroads, located within a line drawn from Boston through Schenectady, Rochester and Niagara Falls, N. Y., Detroit, Duluth, Minn., St. Louis, Cincinnati, Washington, Cape May, N. J., and other Atlantic Ocean terminal points between Cape May and Boston. Prices to railroads are f.o.b. maker's works, with published rate of freight allowed to the nearest point on the line of their road located in the territory mentioned above. For deliveries outside of the territory mentioned, on shipments to all purchasers, freight will be allowed only to the boundary line; the excess to be paid by the purchaser.

Name of Casting:	Discount, Per Cent	Section
Fittings, extra heavy flange	17½	F
Fittings, hydraulic	17½	F
Fittings, low pressure flange	Net	F
Flange castings:		
In lots of 1 to 49 pieces	37½	F
In lots of 50 to 99 pieces	42½	F
In lots of 100 pieces and over	47½	F
Flange fittings, low pressure	Net	F
Flange fittings, extra heavy	17½	F
Flywheel hubs	32½	F
Flywheel segments	32½	F
Flywheels	32½	F
Frames, handhole	17½	F
Frames, jaw crusher	22½	F
Frames, locomotive	27½	C
Frames, manhole	17½	F
Frames, ram	40	G
Frames, riveter	35	F
Frames, stern for merchant ships:		
When cast in one piece	42½	G
When cast in more than one piece	47½	G
Frames, trolley for crane	40	G
Freight car miscellaneous castings	40	A
Gear covers, crane	40	G
Gear segments:		
In lots of 1 to 49 pieces	30	F
In lots of 50 to 99 pieces	35	F
In lots of 100 pieces and over	40	F
Gears:		
In lots of 1 to 49 pieces	30	F
In lots of 50 to 99 pieces	35	F
In lots of 100 pieces and over	40	F
Gears, machine molded	*	
Gears, railway motor	*	
Grizzly bars	32½	F
Guards for sheave	40	G
Guide brackets	40	G
Gyratory crusher housings	22½	F
Gyratory crusher miscellaneous	27½	F
Hammer rams	40	F
Handhole covers	17½	F
Handhole frames	17½	F
Headers	Net	F

Name of Casting:	Discount, Per Cent	Section
Heads, dredge cutter	*	
Heads, hydraulic press	40	F
Heads, peel	40	G
Hearth jackets	42½	F
Hollow crusher rolls	37½	G
Hollow shafts for crane	40	G
Hollow stems for crane	40	G
Hoods, bumper for crane	40	G
Hopper castings	27½	F
Hoppers	27½	F
Hot metal or slag pots	27½	F
Housings, gyratory crusher	22½	F
Housings, pinion	45	F
Housings, roll	45	F
Housings, sugar mill	42½	F
Hubs, flywheel	32½	F
Hubs, propeller	37½	F
Hydraulic fittings	17½	F
Hydraulic press cylinders:		
Plain surface with standard rectangular flange	22½	F
Irregular contour, with wings or special cored openings and flanges	12½	F
Hydraulic press heads	40	F
Hydraulic press miscellaneous	27½	F
Hydraulic press nuts	47½	F
Hydraulic press platens	40	F
Impellers, centrifugal pump	*	
Industrial car, miscellaneous	35	A
Jaw crusher frames	22½	F
Jaw crusher, miscellaneous	27½	F
Joints, ball and socket	17½	F
Journal box wedges (cored type)	55	A
Journal box wedges (solid type)	60	A
Journal boxes	*	
Ladles, copper	20	F
Ladles, slag	20	F
Link and pin drawheads	42½	A
Lip rings for blast furnaces	27½	F
Locomotive frames	27½	C

*Discounts on this class of work will be furnished on receipt of inquiry and drawing showing the castings desired.

Name of Casting:	Discount, Per Cent	Section
Locomotive, miscellaneous	30	E
Lugs, short draft	50	A
Machine work	†	
Machine molded gears	*	
Manhole covers	17½	F
Manhole frames	17½	F
Manifolds	Net	F
Mill pinions	22½	B
Mine car bumpers	42½	A
Mine car, miscellaneous	35	A
Mining machinery castings	30	F
Molds, copper	37½	F
Molds, slag	37½	F
Motor gears, railway	*	
Motor supports, crane	40	G
Nozzles	17½	F
Nuts for hydraulic press	47½	F
Pan rims, refractory	2½	F
Passenger car castings	*	
Pedestals for mine cars	27½	A
Peels and peel heads	40	G
Pinions:		
In lots of 1 to 49 pieces	30	F
In lots of 50 to 99 pieces	35	F
In lots of 100 pieces and over	40	F
Pinions, mill	22½	B
Pinion housings	45	F
Piping, dredge	17½	F
Piping, steam—light	Net	F
Piping, steam—extra heavy	17½	F
Platens, hydraulic press	40	F
Plates, anode	52½	F
Pots, annealing	35	F
Propeller blades	47½	G
Propeller hubs	37½	F
Propeller wheels	42½	G
Pulleys:		
In lots of 1 to 49 pieces	15	F
In lots of 50 to 99 pieces	20	F
In lots of 100 pieces and over	25	F
Push pole pockets	40	A
Racks, gear:		
In lots of 1 to 49 pieces	30	F
In lots of 50 to 99 pieces	35	F
In lots of 100 pieces and over	40	F
Racks, long hollow	*	
Railway motor gears	*	
Ram frames	40	G
Rams, hammer	40	F
Rams, stripper	40	G
Refractory, miscellaneous	10	F
Riding rings	50	G
Rings, riding	50	G
Riveter arms, boiler	Net	F
Riveter frames	35	F
Riveter stakes	35	F
Riveter miscellaneous	22½	F
Road machinery castings	30	A
Rockers for mine cars	27½	F
Roll housings	45	F
Roller tires, refractory	17½	F
Rollers—cement mill	37½	F
Rolling mill miscellaneous	37½	G
Rolls, hollow crusher	37½	B
Rolls, rolling mill	32½	A
Roping and jacking castings	45	
Saddles, boiler	17½	F
Scraper plates, refractory	22½	F
Segments, flywheel	32½	
Segments, gear:		
In lots of 1 to 49 pieces	30	F
In lots of 50 to 99 pieces	35	F
In lots of 100 pieces and over	40	F
Separators, stem	Net	G
Shafts, hollow for crane	40	G
Sheave guards	40	
Sheaves:		
In lots of 1 to 49 pieces	15	F
In lots of 50 to 99 pieces	20	F
In lots of 100 pieces and over	25	F
Shoes, bridge:		
In lots of 1 to 49 pieces	45	F
In lots of 50 pieces and over	47½	F
Side bearings	42½	A
Slag ladles	20	F
Slag molds	37½	F
Slag pots	27½	G
Sleeves, stripper ram	40	G
Smelting plant miscellaneous	27½	F
Snow plow castings	*	
Spindles, solid	45	F
Sprockets:		
In lots of 1 to 49 pieces	15	F
In lots of 50 to 99 pieces	20	F
In lots of 100 pieces and over	25	F
Stakes, riveter	35	F
Steam piping, light	17½	F
Steam piping, extra heavy	17½	F
Steam separators	Net	F
Steam shovel castings	*	
Steam traps	Net	F
Stems, center	40	G
Stems, hollow for crane	40	G
Stern frames for merchant ships:		
When cast in one piece	42½	G
When cast in more than one piece	47½	G
Striking castings	37½	A
Stripper rams	40	G
Sugar mill housings	42½	F
Sugar mill miscellaneous	25	G
Supports, charging bar	40	G
Supports, motor for crane	40	G
Tires for cement mill kilns	50	G
Tires, roller—refractory	50	F
Toggle plates—refractory	22½	F
Trans, steam	Net	G
Trolley frames, crane	40	G
Truck castings, crane	47½	G
Truck columns	35	A
Tuyere jackets	27½	F
Tuyere stocks	22½	F
Valve bodies	17½	F
Valve castings	17½	F
Webs, crank	32½	F
Wheels, brake for crane	40	G
Wheel centers, driving	37½	D
Wheels, crown for sugar mill	42½	F
Wheels, fly	32½	F
Wheels, mine and industrial car:		
Single flange, web plate with plain hub	42½	A
Single flange, spoke center with plain hub	35	A
Irregular designs: Self-oilers, special flanges, etc.	27½	A
Wheels, propeller	42½	G
Wheels, worm:		
In lots of 1 to 49 pieces	15	F
In lots of 50 to 99 pieces	20	F
In lots of 100 pieces and over	25	F
Worms and worm wheels:		
In lots of 1 to 49 pieces	15	F
In lots of 50 to 99 pieces	20	F
In lots of 100 pieces and over	25	F

*Discounts on this class of work will be furnished on receipt of inquiry and drawings showing the castings desired.
†Net prices on machine work will be quoted on application.

FORD PLANTS RESUME

Present Expectation Is That Detroit Industries Will Have Enough Fuel

DETROIT, Sept. 25.—The Ford industries resumed operations at midnight Thursday after a four days' shutdown. Representatives of the company in Cincinnati were able to secure sufficient West Virginia and Kentucky coal to warrant continued operations, and the idle employees were recalled after President Edsel B. Ford telegraphed orders to re-open all plants. In connection with the purchase of coal the only statement obtainable was that it was secured at a "fair" price. There is no doubt that the rescinding of Interstate Commerce Commission order No. 23 made this re-opening a possibility, and it has likewise benefited all Michigan industries. Unemployment contingent upon the Ford shut-down was accurately recorded in the figures of the Detroit Employers' Association as of Thursday, Sept. 21, which showed a decrease of 74,000 as compared with the figures issued a week previous. It will probably be a week or two before these figures return to their former level, as some parts manufacturers have accumulated stocks and there have been reduced schedules in effect since Sept. 15, at several of the local automobile plants. This is reflected in price cuts announced during the week by one important maker of motor cars.

The State fuel administrator does not expect any drastic conservation of fuel and at the present time has some coal available for distribution. In his opinion industries will be able to operate without interruption. Several Michigan cement plants have resumed operations, the wet process mills stating they have enough fuel in sight to carry them until their usual seasonal shut-down shortly after the first of the year. While there is not the volume of construction work which reasonably would be expected if conditions were favorable at this time of year, there is evidence that activities will not fall away later in the season as in other years.

Stove and furnace manufacturers report increases in the demand for furnaces, mostly in replacements. With more open-top equipment available, builders are expecting relief in securing materials. The Pere Marquette has restored all trains withdrawn some weeks ago.

Analyses of coals from 25 States and Alaska are given in bulletin 193, "Analyses of mine and car samples of coal collected in the fiscal years 1916 to 1919," by Arno C. Fieldner, Walter A. Selvig, and J. W. Paul, issued by the United States Bureau of Mines. Information includes heating values. The distribution of the bulletin will be through the Superintendent of Documents, Government Printing Office, Washington, at a price of 35 cents per copy.

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ESTABLISHED 1855

THE IRON AGE

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Two-Thirds Increase in Steel Output

This year's steel ingot output will be approximately two-thirds greater than that of last year. A fairly close approximation of the production in the first eight months of this year can be made by using the output of the 30 companies that make monthly returns to the American Iron and Steel Institute as a basis, and allowing for the production not reported. Production in the present month may be estimated at approximately 60 per cent of capacity, while a forecast of a 65 per cent operation during the fourth quarter cannot be far out. It would require an average error of 7½ per cent in this forecast to make a difference of a single million tons in the year's total. On these assumptions the steel ingot output by quarters in 1922 would be as follows:

	Gross Tons
First quarter	6,650,000
Second quarter	9,050,000
Third quarter	8,000,000
Fourth quarter	8,400,000

The year's total would compare as follows:

	Gross Tons		Gross Tons
1912	30,284,682	1918	43,051,022
1913	30,280,130	1919	33,694,795
1914	22,819,784	1920	40,881,392
1915	31,284,212	1921	19,224,084
1916	41,401,917	1922	32,100,000
1917	43,619,200		

The percentages used in estimating production in the last four months of this year were applied to an assumed capacity of 52,000,000 tons. On this basis the year's output would be 62 per cent of capacity, against about 37 per cent for 1921.

In this department of THE IRON AGE for Feb. 2, 1922, it was argued that it was almost certain that this year would show a large increase in pig iron and steel production over 1921, even though the year should not prove anything like a "good" one; but it may be recalled that the trade did not feel assured that the year would be at all good. The 1921 output would be exceeded, of course, but it was not so certain, in the minds of many, that the rate of ingot production attained at the end of October, 1921, about 25,000,000 tons, would be materially exceeded, on an average. As a matter of fact, the rate promptly dropped to less than 20,000,000 tons in December. The 1922 output, however, as now forecast, at two-thirds more than the output of 1921, is more than one-fourth greater than the highest rate attained in the second half of 1921.

As compared with the best pre-war years, 1912 and 1913, the present year shows a gain of 6 per cent in steel output. There is a decrease in steel exports for 1922 as compared with 1912-13 equivalent to something like half a million tons of ingots, while there is also a decrease in manufactures of steel. If the equivalent ingot tonnage against all exports of steel and manufactures of steel were deducted, the production of steel for purely domestic consumption would show an increase of 10 per cent or more, by comparison with 1912 and 1913.

At long range view it is no small thing to beat the record of those two years immediately preceding the war. The tacit assumption that records in steel output are made only to be beaten held good fairly well before and during the war, but obviously does not rest upon any guaranteed foundation. While the 32,000,000 tons of ingots for this year compares with 30,000,000 tons in 1912 and 1913, it may be set also against the fact that the 25,000,000 tons made in 1910 was a record output in its time, while only five years earlier, in 1905, it required less than 20,000,000 tons to make a record. The pre-war high is quite different from the pre-war averages.

High Prices and Prosperity

The view has been put forth that the coal and railroad strikes have not been an unmixed evil because they have prolonged the current buying movement in the iron and steel market and have caused prices to advance much further than otherwise would have been possible. It has been argued also, in the same connection, that an acute car shortage, such as seems to be in prospect now because of the release of dammed-up coal traffic at a time when the fall grain movement is getting under way, will tend further to extend the duration of the present sellers' market by limiting both production and shipments.

If such thinking is sound, crippled transporta-

tion and interrupted coal output should be regarded as economic benefits, and another strike in the bituminous fields, which appears to be inevitable next year, should be welcomed. Thoughtful men, however, put quite a different interpretation on the present trend of iron and steel prices. This is true of sellers as well as of buyers. After listening recently to a prediction that pig iron would reach $50 on the present advance, a prominent pig iron broker replied that such a market would be nothing short of a calamity. And why?

Advances in prices are not undesirable per se. Under certain conditions they would be welcomed. The broker was not moved by predilection for the bear side of the market but rather by a fear lest the economic situation, already out of adjustment, become more unbalanced. Trade, after all, is an exchange of commodities. If prices of some products remain nearly stationary while those of others advance sharply, it is obvious that the ability and willingness of the producers of the first group of commodities to buy those of the second group will be reduced.

Farm products have risen little above the pre-war level and yet because of the coal strike and the railroad shopmen's strike, coal and iron and steel, basic materials, have advanced markedly, forcing up the prices of many things which the farmer consumes. The farmer buyers' strike which followed the precipitous decline in agricultural products had begun to die out this year with the sharp deflation in the prices of manufactures. That it may break out again is the fear some observers of business tendencies have not hesitated to express, and it is undeniably a cloud on the horizon.

Electric Industrial Heating

Rapid strides have been made in the application of electricity to industrial heating on a commercial scale. Convincing proof of this is the success of the symposium on this subject which American electrochemists conducted last week at their annual meeting in Montreal. Again this organization has been first to carry through a technical program on a new development. Its symposium on electric cast iron at Baltimore last April was notable.

Electricity applied industrially as a source of heat is no longer limited to the melting of ferrous and non-ferrous metals, the field of its most conspicuous successes. In recent years electric heating furnaces have established a place in several industries where lower temperatures rule than those required in the melting or refining of metals. Chief among these uses are the heat treatment of iron and steel and non-ferrous metals and alloys, the annealing of glass, the baking of enamels, the glazing of ceramics and the generation of steam.

The use of electricity as a source of heat has assumed commercial importance in all these fields, especially in the heat treatment of steel. In the enameling industry, particularly for automobiles, it is estimated that electricity furnishes 90 per cent of the heat now used. Its application to glass and ceramics has not been so extensive.

Because of ease of regulation, freedom from oxidizing and other gases, cleanliness and other considerations, over-enthusiasm as to the use of electricity has resulted in some mistakes and misapplications, as well as in extravagant claims. Manifestly there are cases in which other fuels are cheaper in the last analysis. It is to be said, however, that accuracy of control in heat treatment, resulting in a superior product handled more quickly and in larger quantities, is a vital consideration neutralizing the higher cost of electrical heat. But satisfaction and success in the operation depend greatly on proper equipment.

The Montreal symposium has served well to call attention to the mistakes that have been made, to the different kinds of equipment suited for certain work, and to the lines on which further progress will be made. It has been well said that a furnace must be designed with as much care and in such variety as machine tools are designed, for it is not simply a pile of bricks with a torch in it. Too much has been taken for granted in many cases and electric furnaces of low efficiency or doubtful economy have been applied to the wrong use. In no field are results more dependent upon direction by a resourceful engineer.

Canada's Depression in Steel

Acute depression persists in the Canadian steel industry. Production of both pig iron and steel has fallen below anything recorded in the past fifteen years. Monthly rates in gross tons for various years have been as given below:

	Pig Iron	Steel Ingots and Castings
1922 to Sept. 1	32,000	37,000
1921	50,000	56,000
1920	81,000	92,000
1918	89,000	140,000
1908	47,000	44,000

The rate for the first eight months of this year is only about 64 per cent of that in 1921—a year in which output in the United States was at minimum in relation to capacity. At the close of last month only three blast furnaces out of 17 in Canada were operating. The contrast with improving conditions in the American industry is marked.

The steel industry of Canada is far more dependent than that of the United States on the purchasing power of the railroads. There is no automobile industry and no widespread building campaign as on this side of the line. The present Canadian depression is due largely to the inability of the railroads to buy new equipment, even though sorely needed. Lack of coke and coal is also a factor. The dispute in the Nova Scotia coal industry has aggravated the situation and a deadlock between the railroads and their shop employees over a reduction in wages was for a time a serious menace. In general the industrial situation has been very precarious. Crop prospects, which for a time were unfavorable due to drought in portions of the Saskatchewan and Alberta districts, have turned for the better and the outlook is now for larger yields in the principal crops than in 1921. Strike settlements in the United States will be helpful and a gradual increase in railroad buying, following an almost unprecedented abstention over 18 months, should

give work to the steel companies. Heretofore they have found home demand affected by betterment in the United States, though never before has the response been so slow.

Economics and Markets

Right thinking along economic lines is undoubtedly increasing. The stimulus is necessity, not desire. The disruptions incident to the war have made economic laws work fast and with severe effect so that these laws cannot be lightly regarded as before the war.

It is helpful to reflect how right thinking on economic lines is handicapped by the constant attention given to market prices and market conditions. Every one wishes to sell goods or service. The conditions that make for a good market in the individual case are often not the conditions that make for economic progress in general. Yet economic progress is for the good of all, making for permanent benefit.

Here is really a complete antithesis. Something occurs that improves the market for the individual, yet at the same time it acts to retard the economic progress of the country. Unbiased reflection would discern both the good and the bad in that development, but as each one thinks for himself the good is impressed on the mind, the bad is not. Vice versa, a development may occur that injures a given market yet improves the economic position of society.

The individual probably feels that he is fully capable of appraising these things at their true value, giving due weight alike to the particular influence and the general influence when these are divergent in character, but in actual practice, in the crowded activities of the day, the necessary poise cannot be held to avoid over-rating the importance of the temporary influence as compared with the permanent influence. We are so busy with, and so full of, the details of "the market" in which we must sell our goods or services that we are handicapped in considering the general economic trend of the developments. The remedy is to recognize frankly that circumstances impose upon us what is virtually a personal equation, something that one must allow for, in reaching his general conclusions.

These cases of developments having opposite influences are numerous and varied. To illustrate, a condition develops in which the railroads are unable to place as many cars as the shippers desire for moving their goods. Particularly if one is a purveyor of railroad supplies the immediate influence is that the railroads must now buy more cars or locomotives, which will help to make business "good." The underlying and less recognized point is that the railroads lose revenue, and the country loses in productive accomplishment, by every car that is not placed when it is wanted. It would be better if transportation occurred without any work at all having to be done. Then we could make and wear more suits of clothes in a year, or produce and wear out more automobile tires, or take more afternoons off to play golf. Obviously we should be better off if transportation did not involve making and operating rolling stock. Or, again, in coal, if mining or transportation is difficult more money is paid and received for coal. This may be good temporarily for the coal producer, but developments involving the use of coal are hindered and the demand in future will be less, when the largest possible demand will be desirable to furnish employment for the capital invested.

Upon the public mind in general the great notoriety that is given to restrictions in supplies of commodities and advances in prices due to uneconomic conditions, and the little advertising received by developments that make for economies, the saving of material and mental and physical effort, militate against a proper appraisal of what makes for society's permanent progress and advancement. Transient market conditions should not crowd out of mind a full appraisal of what the economic trends will bring.

Iron ore importations have increased rapidly in the last few months and represent a movement of significance. The receipts for June and July were 300,500 gross tons or 80 per cent of the total for the seven months of this year; 257,000 tons of the 300,500 came from Sweden and Cuba, about equally divided. Compared with previous movements, the present is the largest since 1913, when the importations were 216,230 tons per month. In 1920 receipts of foreign iron ore were 101,120 tons per month and very much less in 1919 and 1921. At the rate at which importations are now coming the 1922 movement will probably exceed that before the war. Due to high cost of transportation on American railroads, ore from Sweden and Spain can be delivered to Pennsylvania blast furnaces at considerably less per unit than can the ores of Lake Superior.

CORRESPONDENCE

Improvements in Fuel Utilization a Factor in Economic Readjustment

To the Editor:—A survey of the world's natural resources and of its agricultural possibilities certainly would show no scarcity, or immediate prospect of a scarcity, of any of the raw materials essential to the present-day needs of man, varied and enlarged as are those needs with the civilized peoples. The obvious problem then in the economic restoration and continued well-being of the world's material affairs is to make these resources available under practicable cost conditions and to distribute them cheaply to the ultimate users. The degree of effectiveness attained with respect to the production and transportation of materials and commodities has been for some time one of the more or less vain boasts of the modern civilized man. But the results attained in these fields of man's endeavors to live and to live well have at times been offset or nullified by the continued, and in most cases unnecessary, inefficiency in the utilization of these natural materials and of the direct or intermediate products from them.

This inefficiency is especially true with respect to the use of coal for all purposes. The ordinary steam engine hardly realizes more than 10 per cent of the

total heat energy of the coal, and improved steam turbine engines and electrical operations based on the use of coal do not often attain to an efficiency greater than 15 per cent. This condition has led to belated but sound endeavors to improve the methods and equipment for the use of coal. The most promising efforts are directed to the special treatment of the coal in various ways for the different ends desired.

The present developments relating to the treatment of coal are most involved in methods, fundamentally similar but variously applied, by which the crude material is submitted to a low heat, thereby recovering some of the volatile gases and the oil and by-products, reconsolidating the residue by improved briquetting methods so that it becomes a very desirable hard fuel, better than the original coal and equal to the best coal for most purposes. The value of the gas, oil and by-products, and the enhanced value of the prepared coal products, are from two to three times as much as that of the untreated coal generally and in some cases coal which is practically unusable can be utilized by this method, which is variously called low temperature treatment or carbonization. New equipment and better technic have so increased the results from this method of coal treatment that it is likely soon to be very widely established, not only for low grade coal but also for coal now considered of the best quality.

The method, speaking very generally, is based on a regulated low heat variously applied to the exterior of a specially designed retort in which the coal, usually crushed fine, is placed. These retorts are continuous in operation and, while comparatively costly to install, are very cheap in operation. Its first applications in America are being determined by geographical considerations connected with the location of suitable low grade coal deposits tributary to a sufficient market and removed from the competition of cheap and good coal available through cheap transportation for present requirements. However, ultimately the idea may be substituted completely for the present wasteful and ineffective methods of the direct use of natural coal of any grade for fuel or power purposes.

Other plans for the conservation and better utilization of the great potential wealth stored by nature in the coal beds propose to convert the coal directly into gas at the mine and to convey the gas to distant centers of consumption. Another plan is to make "mouth-of-mine" electricity and to transmit this concentrated form of heat and energy to points of use.

It seems certain that the old methods of using coal direct for heat and power will be superseded soon and that thereby a new and large source of supply of oil, gas, ammonia and chemical by-product, all materials essential to present-day industrial needs, will be created. The need of the change of method in the use of coal is related to fundamental considerations based on the part which energy sources and supply must play in the development of the present-day complex industrial needs. The factor of waste in transportation is also becoming of increased concern as the volume and demands of modern conditions become more intense and varied. It is this matter of cost of delivery of the energy which is one of the largest considerations in the new movement to make better and different use of the energy possibilities of our fuels. The whole business is in its beginning, but the records of actual accomplishment and the special needs of the day will surely compel its rapid realization.

KIRBY THOMAS
Consulting Engineer.

New York.

Larger Earnings of Steel Workers

WASHINGTON, Sept. 26.—While the number of employees in the iron and steel industry declined from 155,030 in July to 153,260, or 1.1 per cent in August, in 125 establishments, the semi-monthly payroll increased from $6,523,949 in July to $7,424,212, or 13.8 per cent in August, according to the Bureau of Labor Statistics Department of Labor. The ratio of increase in per capita earnings was 15.1 per cent in August over July.

Pittsburgh Base Case Hearings

WASHINGTON, Sept. 26.—The Federal Trade Commission has not as yet determined the date or place for the resumption of hearings in the Pittsburgh base case. It was originally intended by the commission to renew the proceedings for the purpose of submitting additional direct testimony the fore part of the present month, but it is understood that the work of preparing for the testimony has delayed the time for resuming the hearings. It is now stated that they may not be begun for two or three weeks. While it has not been definitely decided upon, consideration has been given by representatives of the commission to the taking of additional testimony in Pittsburgh. After this is submitted, the Steel Corporation will present its side, to be followed by rebuttal testimony of the commission.

New York Steel Treaters to Try to Secure 1923 Convention for New York

A serious attempt has been inaugurated by the New York chapter of the American Society for Steel Treating to secure the 1923 national convention and exposition for New York City. A resolution was passed at the September meeting, Sept. 20, authorizing the officers of the local chapter to go to the Detroit convention next week and put forth every possible effort to achieve success.

Ordnance Plant to Be Converted Into Repair Shop

The ordnance plant of the Crucible Steel Co. of America at Harrison, N. J., built during the war to meet the demands of the United States and its Allies, and which has been idle for the greater part of the time since the ending of hostilities, will be converted into a locomotive repair shop. At the present time, there is urgent demand for such a shop.

Reduced Rate on Imported Iron

WASHINGTON, Sept. 26.—The Interstate Commerce Commission has permitted the Chesapeake & Ohio Railroad to put into effect a rate of $2.25 per gross ton to Lynchburg and $1.50 to Richmond, Va., from Newport News, Va., on imported pig iron.

The Iron Age and Its Readers

THE full text of the Metal Schedule of the Fordney-McCumber tariff act, which became a law at midnight on Thursday, Sept. 21, was given to IRON AGE readers in last week's issue. Many and important changes were made in the duties on metals and their products, particularly in duties imposed on various raw materials of iron and steel manufacture.

Our readers have learned to depend upon THE IRON AGE for information found nowhere else in the business press. No other publication of last week contained the text of this metal schedule, whose provisions and their effect have been so widely discussed among producers and consumers of iron and steel and other metals, and with it the corresponding duties of the Underwood-Simmons act and the Payne-Aldrich act.

As it has done with other tariffs, THE IRON AGE is reprinting in pamphlet form the new Metal Schedule and the duties in the two tariff acts which preceded it. Copies will be sent to any of our subscribers who ask for them.

Iron and Steel Markets

OVER 1,000,000 TONS OF RAILS

A Week of Unusual Buying Before the $43 Price Applies

Production Higher and Pig Iron and Steel Prices Easier—Car Shortage Hampers Greatly

The placing of large orders for rails at the $40 price, which on Oct. 1 is replaced by $43, has given the steel trade what is probably the most active week in railroad material it has ever known. All the important lines in the country and many smaller ones have either contracted for their 1923 rails, wholly or in large part, or made reservations which will become definite tonnages a little later. In the Chicago district this business amounts to about 450,000 tons and will be 500,000 tons by the end of the week. In the East nearly as much more is reported. Adding orders which will go to the Alabama and Colorado mills gives a total well above 1,000,000 tons.

In the above calculation the New York Central's quota is put at 125,000 tons, the Pennsylvania's at 80,000 and that of the B. & O. at 35,000 tons. These amounts are expected to be increased in the final negotiations.

The remarkable run of locomotive buying which followed the railroad shopmen's strike has kept up, the past week's orders being for 136, while fully 350 are pending. The latter include 100 for the New York Central, whose last two orders were for 240 in all. The week's total of new cars is 4450 and 8200 more are under negotiation.

In operations the industry has worked up close to 70 per cent of capacity, which represents rapid betterment in the past three weeks. But there is little hope of improving on this rate. The fear is that it may not be maintained, since car shortages have caused the piling up of considerable finished steel at mills, and some blast furnaces recently blown in have had to pile pig iron in their yards. Cars and motive power will be the gage of operations for a good many weeks.

However, the increase in fuel supply has been enough to relieve the tension in finished steel and to check, at least for the time, the upward tendency of prices.

Of the advance of $3 a ton in wire products, made by independent producers early in the month, $1 has come off this week, but the American Steel & Wire Co.'s prices apparently have gone up $2, making a more nearly uniform market than has been seen in months.

There are more indications, also, of a 2c. to 2.10c. range by the Steel Corporation on plates and shapes and of 1.95c. to 2c. on some of its bar business. At the same time 2.25c. is more commonly the maximum on new business in these three products that has gone to independent mills.

With a seasonal decrease in structural orders, fully one-third of the week's contracts have been for tank work. A new sheet mill building at Weirton, W. Va., calls for 2000 tons. In plates, locomotive firebox steel is the strong feature. On the Lakes a 600-ft. ore boat, taken by a Detroit yard, will mean 5000 tons of steel.

Generally speaking, it has been a quiet week for finished steel apart from rails.

Owing to increase in production and the waiting policy of many buyers, pig iron prices have developed a decided tendency downward and in some centers in the North quotations are from $1 to $3 lower. In the South, sales have been made at $27.50 and even higher, but the $27 quotation still prevails and resale Southern iron has been disposed of at $26. A very unusual recent shipment was 5000 tons of iron taken by lake vessels from Duluth to Buffalo and thence by rail to New England consuming points. Basic iron has declined $2 in eastern Pennsylvania. Foreign iron continues to dominate the Atlantic Coast markets.

Makers of beehive coke have made sales at an advance of 50 cents and more in the week. Car shortages rather than labor troubles are limiting production, the strike in the north portion of the Connellsville district being on the wane.

Prices of 80 per cent ferromanganese, under the new duty of $33.60 a ton, have not been established, since duty-free imports of the British product have been heavy in recent weeks. It remains to be seen how much of the new duty British producers will absorb and how far, in a competitive market, domestic consumers will get the benefit of the duty-free manganese ore brought in before Sept. 22. Similar uncertainties exist in the market for high-grade ferrosilicon, on which the duty was 15 per cent (or $7 to $9 per ton) and is now 2c. per lb. of contained silicon.

Pittsburgh

Car Shortages Curtail Shipments—Pig Iron Prices Lower

PITTSBURGH, Sept. 26.—Rising tendency of iron and steel production in this district, which has been marked over the past two weeks, is likely to be checked by car shortages, which already have seriously curtailed shipments and have resulted in the piling up of a considerable tonnage. Storage space is becoming exhausted in practically all districts because of the inability of the railroads to take care of the increased production. The problem of the most favored producer in this district is in getting finished material away from the mills. The scarcity of labor still is largely unrelieved and likely to continue so long as the weather is favorable enough to make outdoor work more attractive than indoor occupations.

On top of these developments there is a possibility of a fresh shortage of fuel, due to the fact that production of coal, like the shipments of steel, is affected by an insufficient supply of empty cars. The bulk of the current production of coal is being shipped to distant points and there is so much congestion at terminal

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Sept. 26, 1922	Sept. 19, 1922	Aug. 29, 1922	Sept. 27, 1921
No. 2X, Philadelphia‡	$34.26	$34.26	$34.14	$21.84
No. 2, Valley furnace†	*33.00*	36.50	33.00	21.00
No. 2, Southern, Cin'ti†	31.05	31.05	27.05	23.50
No. 2, Birmingham, Ala.†	27.00	27.00	23.00	19.00
No 2 foundry, Chicago**	32.00	32.00	30.00	22.00
Basic, del'd, eastern Pa	*29.00*	31.00	28.64	19.25
Basic, Valley furnace	34.00	34.00	30.00	19.25
Valley Bess., del. Pitts	35.77	35.77	33.76	21.96
Malleable, Chicago*	32.00	32.00	30.00	22.00
Malleable, Valley	34.00	34.00	33.00	20.50
Gray forge, Pittsburgh	*34.27*	37.77	34.76	21.96
L. S. charcoal, Chicago	36.15	36.15	36.15	31.50
Ferromanganese	67.50*	67.50	67.50	60.00

*C.i.f.

Rails, Billets, Etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$40.00	$40.00	$40.00	$47.00
Bess. billets, Pittsburgh	40.00	40.00	38.00	29.00
O.-h. billets, Pittsburgh	40.00	40.00	38.00	29.00
O.-h. sheet bars, P'gh	40.00	40.00	38.00	32.00
Forging billets, base, P'gh	45.00	45.00	43.00	34.00
O.-h. billets, Phila	45.17	45.17	45.17	35.74
Wire rods, Pittsburgh	*45.00*	47.50	45.00	41.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	2.00	2.00	2.00	1.60
Light rails at mill	2.25	2.25	2.00	...

Finished Iron and Steel, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	*2.475*	2.575	2.325	1.95
Iron bars, Chicago	2.25	2.25	2.25	1.75
Steel bars, Pittsburgh	2.00	2.00	2.00	1.60
Steel bars, Chicago	2.10	2.10	2.35	1.75
Steel bars, New York	**2.44**	2.34	2.34	1.98
Tank plates, Pittsburgh	2.25	2.25	2.00	1.60
Tank plates, Chicago	2.30	2.30	2.20	1.65
Tank plates, New York	2.49	2.49	2.34	1.98
Beams, Pittsburgh	2.00	2.00	2.00	1.60
Beams, Chicago	2.20	2.20	2.35	1.75
Beams, New York	**2.44**	2.34	2.34	1.98
Steel hoops, Pittsburgh	2.75	2.75	2.75	2.25

**The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire, *Per Lb. to Large Buyers:*	Sept. 26, 1922 Cents	Sept. 19, 1922 Cents	Aug. 29, 1922 Cents	Sept. 27, 1921 Cents
Sheets, black, No. 28, P'gh	3.35	3.35	3.35	3.00
Sheets, galv., No. 28, P'gh	4.35	4.35	4.35	4.00
Sheets, blue an'l'd, 9 & 10	2.50	2.50	2.50	2.25
Wire nails, Pittsburgh	**2.70**	2.60	2.60	2.90
Plain wire, Pittsburgh	**2.45**	2.35	2.35	2.60
Barbed wire, galv., P'gh	**3.35**	3.15	3.15	3.55
Tin plate, 100-lb. box, P'gh	$4.75	$4.75	$4.75	$5.25

Old Material, Per Gross Ton:				
Carwheels, Chicago	$24.50	$24.50	$22.50	$15.00
Carwheels, Philadelphia	23.00	23.00	19.00	17.00
Heavy steel scrap, P'gh	**21.50**	21.00	18.50	14.00
Heavy steel scrap, Phila	18.00	18.00	15.50	11.50
Heavy steel scrap, Ch'go	**18.50**	18.00	17.00	11.75
No. 1 cast, Pittsburgh	24.00	24.00	19.00	17.00
No. 1 cast, Philadelphia	23.00	23.00	19.00	17.00
No. 1 cast, Ch'go (net ton)	21.00	21.00	20.00	13.50
No. 1 RR. wrot., Phila	22.00	22.00	18.50	15.50
No. 1 RR. wrot., Ch'go (net)	17.50	17.50	15.50	11.50

Coke, Connellsville, Per Net Ton at Oven.				
Furnace coke, prompt	**$12.00**	$11.50	$10.00	$3.25
Foundry coke, prompt	**13.00**	12.50	12.00	4.25

Metals, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Lake copper, New York	**14.25**	14.12½	14.12½	12.25
Electrolytic copper, ref'y.	13.75	13.75	13.75	12.12½
Zinc, St. Louis	**6.87½**	6.65	6.25	4.35
Zinc, New York	**7.22½**	7.00	6.60	4.85
Lead, St. Louis	**6.25**	5.90	5.55	4.45
Lead, New York	**6.50**	6.25	5.90	4.70
Tin (Straits), New York	**32.50**	32.12½	32.30	26.75
Antimony (Asiatic), N. Y.	6.75	6.75	5.25	4.60

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price, Sept. 26, 1922, Finished Steel, 2.433c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel

Sept. 19, 1922,	2.419c.
Aug. 29, 1922,	2.412c.
Sept. 27, 1921,	2.236c.
10-year pre-war average,	1.689c.

Composite Price, Sept. 26, 1922, Pig Iron, $32.54 Per Gross Ton

Based on average basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

Sept. 19, 1922,	$32.52
Aug. 29, 1922,	29.52
Sept. 27, 1921,	20.10
10-year pre-war average,	15.72

points, not to mention the poor condition of so much of the railroad motive power, that long periods are consumed between the departure and return of cars to the mines. A very tight situation appears to be immediately ahead. However, the relief which has been afforded the industry by the comparative abundance of coal since the settlement of the strike has permitted production to increase sufficiently to bring about an easier supply situation and to halt, at least temporarily, the upward tendency of prices. The market appears to have crystallized at 2c. to 2.25c. for plates, shapes and bars, and while there are occasional sales of small lots of plates, as high as 2.50c., the more common maximum is 2.25c., and reasonably early deliveries are being promised at that figure.

The advance of $3 per ton in wire products, set up by independent producers early in the month, has been partially lost in the past week when the American Steel & Wire Co. made an advance of $2 per ton and most independents receded to that level. Independent sheet makers have firmer price ideas because it is claimed that with sheet bars at $40, recent prices will not let them out with a profit. The Steel Corporation sheet-making subsidiary, however, still is taking on moderate tonnages from its regular customers, at the old prices.

Increased pig iron production is reflected in a slightly softer market, but the downward slant of prices is likely to be short lived, since coke prices again are moving up strongly and this may deter blast furnace resumptions. The scrap market has lost none of its recent strength.

Pig Iron.—As a result of the resumption by a merchant furnace in the Valley district and sales from this furnace, it is once more possible to quote foundry iron from a Valley basis. This interest has taken about 1000 tons for October delivery on a basis of $33, furnace, for No. 2 grade. It is doubtful, however, whether this price could be duplicated because iron cannot be brought in from other districts at a price that low, and neither the seller of this lot nor other producers in the Valley district would go that low to secure an order. Some makers say $35 is as low as they would take business and they feel that this is little enough with coke commanding $12 per ton or more at ovens. There has been no change in the prices of the steel-making grades from Valley furnaces, $34 still being quoted on both basic and Bessemer products in that district. Sales at that level, however, are somewhat

difficult for shipment in this direction, since the Cambria Steel Co. is a seller and recently took 2000 tons of basic at $30, f.o.b. Johnstown, for shipment to a West Virginia sheet maker. The freight rate to consuming point from Johnstown is $2.52, which would be equivalent to $30.63 at Valley furnaces. The Jones & Laughlin Steel Co. will light its tenth furnace this week. The Cambria Steel Co., Johnstown, now has six furnaces blowing, an increase of one, and the Weirton Steel Co. will turn on the blast this week on the furnace which it banked a few weeks ago. These additions will bring the total number of furnaces in this and nearby districts to 75 out of a total of 139. This is a gain of 25 furnaces since the last week of August, and is only one less than the number in blast at the peak point during July.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$34.00
Bessemer	34.00
Gray forge	$32.50 to 33.50
No. 2 foundry	33.00 to 35.00
No. 3 foundry	32.50 to 33.50
Malleable	34.00

Ferroalloys.—Although the new tariff is a law, domestic manufacturers of ferromanganese have not yet announced prices and probably will be slow to do so until it is fully established that prices of British material are not going to decline, and until there is some assurance of a constant supply of coke. It is impossible to quote domestic material or to give any definite idea of what the price will be. Basing on the present price of British 80 per cent ferromanganese of $67.50 c.i.f. Atlantic seaboard, plus $33.60, which the duty of 1⅞c. per lb. contained manganese means on 80 per cent material, the American price would be $101.10, at seaboard. Hardly enough business lately has been done to determine prices. Spiegeleisen has stiffened in price again, one sale of 3000 tons of average 20 per cent material being noted to a central Ohio steel maker at $38, furnace, as against $37 the recent minimum. On small lots as high as $39 is now being asked.

We quote 78 to 82 per cent British ferromanganese, $67.50 c.i.f. Atlantic seaboard; domestic producers have not yet announced prices. Average 20 per cent spiegeleisen, $38 to $39 furnace; 16 to 19 per cent, $37 to $38; 50 per cent ferrosilicon, domestic, $55 to $60 furnace, freight allowed. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, $50.50; 11 per cent, $53.80; 12 per cent, $57.10; 13 per cent, $61.10; 14 per cent, $64.10; silvery iron, 6 per cent, $39; 7 per cent, $40; 8 per cent, $41.50; 9 per cent, $43.50; 10 per cent, $45.50; 11 per cent, $48.80; 12 per cent, $52.10. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $3.66 per gross ton.

Steel Skelp.—As a number of pipe makers who ordinarily make their own skelp, but who for some time have been buying are once more in production, demand has decreased considerably and sentimentally the market is easier than it has been. While small tonnages of narrow grooved skelp might possibly be sold at 2.50c., the more common maximum is 2.25c. and contract buyers are not believed to be paying more than 2c.

Wire Products.—There has been an increase of $2 per ton in the Steel Corporation prices but a decline of $1 per ton in the independent prices since last account. As of Sept. 21, the American Steel & Wire Co. announced an advance to $2.70 base, per keg, Pittsburgh, for nails; $2.45 base per 100-lb., Pittsburgh, for plain wire and $2.20 base per count keg for coated nails. Most independent manufacturers have adopted these bases and have revised to these prices orders which had been taken at the higher prices recently in effect. The only important exception is in manufacturers' wire, which is scarce, and for which $2.50 base per 100-lb., Pittsburgh, still is obtainable. Prices are given on page 837.

Iron and Steel Pipe.—Makers of merchant steel pipe in the butt weld sizes still are about 60 days behind in their deliveries, and the claim is made that not much progress is being made in reducing obligations because of the scarcity of labor and cars. Few manufacturers, consequently, are benefiting as yet by the advance in prices made Aug. 15, nor can they until old orders are cleaned up. This fact, together with the wage increase which became effective Sept. 1, which the manufacturers are obliged to absorb, finds reflection in frequent intimations of a further advance in prices. Makers are not nearly as heavily obligated on the lap welded sizes as on the small sizes and are making deliveries against new business as promptly as four and five weeks. Lack of heavier bookings in the lap welded sizes is accounted for largely by the depressed condition of the oil industry. It is now stated that the recent 1000-mile line pipe order placed by the Standard Oil Co. of Indiana and the Sinclair Oil Co. with the National Tube Co., will amount to about 125,000 tons. Prices recently announced on wrought iron pipe find very little basis in sales, indeed much of the tonnage moving is at the prices in effect prior to the advance of Aug. 15. Discounts are given on page 837.

Wire Rods.—In keeping with an increase of $2 per ton in wire products, effective Sept. 21, the American Steel & Wire Co. also advanced wire rods to a similar extent, its new price being $45 for No. 5 common soft rods, Pittsburgh or Youngstown. Independent makers who have been making spot sales lately at from $47.50 to $50, are expected to adopt the Corporation price on rods which most of them already have done on wire products.

We quote No. 5 common basic or Bessemer rods to domestic consumers, $45 to $47.50; chain rods, $45 to $47.50; screw stock rods, $50 to $52.50; rivet and bolt rods and other rods of that character, $45 to $47.50; high carbon rods, $52 to $57.50, depending on carbon, per gross ton, f.o.b. Pittsburgh or Youngstown.

Billets, Sheet Bars and Slabs.—While a considerable tonnage of sheet bars recently has been sold in the Youngstown district for both early and fourth quarter shipment at $40, a number of makers have yet to announce prices for the last three months of the year. The common impression is that the price will be $40, but this will be by independents rather than the Steel Corporation. The latter is believed to have so much tonnage due its customers on third quarter contracts that it will seek to ship what is still due, together with moderate additional allotments, at somewhat lower prices than are likely to be named by independent producers. Sales of soft billets of fair size are being done at $40, Pittsburgh. This price, however, refers to early deliveries and slightly less may possibly be named on fourth quarter contracts. There is little interest in slabs, but $40 also is regarded as a fair appraisal of to-day's market on that form. Bessemer capacity in the Youngstown district is operating full this week, while open-hearth operations are 90 per cent of capacity. A leading independent here is operating close to 75 per cent of capacity. The Steel Corporation's leading steel making subsidiary is operating close to 70 per cent, but shipments are below this rate because of car shortages.

We quote 4 x 4-in. soft Bessemer and open-hearth billets, $40; 2 x 2-in. billets, $40 to $42; Bessemer sheet bars, $40; open-hearth sheet bars, $40 to $42; slabs, $40; forging billets, ordinary carbons, $45 to $47, all f.o.b. Pittsburgh or Youngstown mills.

Sheets.—With a market on sheet bars fairly well established at $40, there is an increased disposition on the part of independent producers to seek more money for the finished product. Not only is there the factor of costs, but the leading interest is practically out of the market for tonnages for shipment over the remainder of the year, taking on only such tonnages as will fit in with its schedules and these only from regular customers. This means that independent companies are called upon to supply most of the current demand and on such business $3.50c. base is minimum on black sheets and 4.60c. on galvanized. Independent makers are operating at a very high rate, in the Youngstown district 95 per cent of the mills being in operation, and it is stated that several of them will have completed their third quarter obligations in full by the end of the month, or soon afterward. Inability to obtain sufficient supplies of steel, due to car shortages, checks the leading interest from catching up with its obligations. Prices are given on page 837.

Tin Plate.—Suggestions of independent prices for first quarter of 1923 as high as $5.25 per base box, Pittsburgh, are heard, and the common expectation is that $5 is as low as any of the independents will go for that period. The American Sheet & Tin Plate Co. is silent on the subject of early 1922 prices, and will not

announce them for at least a month. Current demands are seasonably light and are providing no strain upon production. On account of high producing costs, however, concessions from the official quotations of $4.75 per base box are much slighter and less frequent than usual.

Cold-Finished Steel Bars and Shafting.—The demand is good from the automotive industry, but is disappointing from others, especially from the manufacturers of agricultural instruments. Makers depending upon the Carnegie Steel Co. for supplies of hot-rolled bars are not yet getting very large shipments and purchases from independent mills usually are at prices ranging anywhere from 2c. to 2.15c., Pittsburgh, and occasionally higher. The high cost of hot-rolled bars largely explain the firmness in cold-finished stock, which is quoted at 2.50c., base Pittsburgh, for carloads and 2.75c. for less than carloads. Ground shafting is unchanged at 2.90c. base f.o.b. mills, for carloads and 3.15c. for less than carloads.

Hot-Rolled Flats.—The market holds firm at a minimum of 2.75c., base, Pittsburgh, but is 3c. on tonnages wanted promptly and on narrow, light stock. Few makers will consider less than 3c. The automotive industry still is the principal source of demand for strips.

Cold-Rolled Strips.—Demand still is sufficient to support 4.25c., base, Pittsburgh, and even a premium of $5 per ton on a few tonnages is wanted for early delivery. Costs are high on account of steel and labor shortages and there are intimations of an early advance to 4.50c., base.

Steel Rails.—The market on light rails is well established at 2.25c. base, mills, for those rolled from new steel. All makers are quoting this price and a fair amount of business is being entered. Railroads ordinarily served on standard rails from Pittsburgh are reported to be entering orders to escape the $3 per ton advance, effective Oct. 1, but tonnage details are not made public.

We quote 25 to 45-lb. sections, rolled from new steel, 2.25c. base; rolled from old rails, 2c. base; standard rails, $40 per gross ton mill for Bessemer and open-hearth sections.

Steel Chain.—An advance of $10 per ton in steel chain has been announced by leading manufacturers, effective Sept. 20. The new price is 6c., base, Pittsburgh, for proof coil chain. Steel loading chain has been advanced $40 to $90 per ton from the prices named in the last previous list, dated Jan. 4, 1922. Discounts on electric welded bright chain and on cow ties have been cut 5 per cent.

Iron and Steel Bars.—The market is still quotable from 2c. to 2.25c., base, Pittsburgh, on steel bars. The lower price is believed to be as low as the Steel Corporation now will accept business, although it has made no official announcement. Some of the independent makers are trying to "marry" old, low-priced contracts with new ones and this has resulted in some new contracts to replace old ones carrying averages prices well under 2c. Iron bars are firmer with refined bars now quotable at 2.60c.

We quote steel bars rolled from billets at 2c. to 2.25c.; reinforcing bars, rolled from billets, 2c. to 2.25c. base; rail steel reinforcing bars, 1.90c. to 2c.; refined iron bars, 2.60c. in carloads, f.o.b. mill, Pittsburgh.

Structural Material.—Prices show no material change, still ranging from 2c. to 2.25c., according to the size of the order. Structural mill activities lately have been on a rising scale, but they are not catching up very rapidly with their deliveries because of car shortages. Structural inquiries are seasonably light, most of the bookings of fabricating shops being for small tonnages. Bids will be taken this week by Weirton Steel Co., Weirton, W. Va., on its new sheet mill building, for which about 2000 tons of steel will be required. Plain material prices are given on page 837.

Plates.—The market here is quotable generally at 2c. to 2.25c. base, Pittsburgh, but for early deliveries 2.25c. is the prevailing price and 2c., which is believed to be the Steel Corporation price, refers to such tonnages as it can take from its regular customers for indefinite delivery. The Pennsylvania Tank Car Co. recently took 500 tank cars for the Chaplin Refining Co., Enid, Okla. Plates for this order have not yet been placed. Prices are given on page 837.

Boiler Tubes.—Good demand still is reported for steel tubes, both lap welded and seamless, and on the former some makers now are limiting their bookings. Prices are very firm owing to high costs entailed in labor and car shortages. Makers of charcoal iron tubes have not yet announced new prices as they were expected to, following the withdrawal recently of the old quotations. Discounts are given on page 837.

Track Fasteners.—The market is firmer on all products under this head. New prices have not yet been announced on angle bars. On spikes, most makers, including the Steel Corporation, now are quoting 2.85c., base, Pittsburgh, for 9/16-in. and larger and 3.85c., base, Pittsburgh, for track bolts in carload lots. Tie plates have sold as high as $50 per net ton, and $45 now is minimum. There is a brisk demand for small spikes and while one maker here holds to the 3.25c., base, the more common quotation is 3.50c., and there have been sales as high as 3.75c. Prices are given on page 837.

Nuts and Bolts.—There is a good deal of activity on the part of distributors in getting in specifications against third quarter contracts to escape the advance set up early this month and which is applicable to fourth quarter business. Discounts are given on page 837.

Rivets.—Prices are unchanged, but the market is firm because of the scarcity of steel and the fact that buyers still are specifying freely, while there is a very satisfactory amount of new business. Prices and discounts are given on page 837.

Coke.—A further advance of about 50c. per ton has taken place in beehive oven coke prices in the past week, due to the fact that demand still exceeds the supply, since car shortage rather than labor troubles are limiting production. Furnace coke lately has sold readily at $12 and some sales have been made as high as $13 per net ton ovens. On foundry grade, $13 has become the minimum and there has been some business at $14 or more. The strike in the northern portion of the Connellsville district seems to be on the wane as operators in that section lately have had a good many men apply for work.

Old Material.—The market does not yet give sign of having reached the top. Further advances of 50c. to $1 per ton have been established by sales in the past week and so little tonnage of the steel works grades is presently available that some dealers have set $25 as the minimum at which they would sell for delivery over the remainder of the year. Heavy melting steel has been sold at $21.50, at Butler, Pa., and at $22 at Vandergrift and Midland, Pa. Youngstown melters are reported to be smaller buyers than recently, but high prices for Youngstown delivery still are being offered by dealers short against sales at that point. With the markets east and west of Pittsburgh netting higher prices than are offered here, not much scrap is coming to this point.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

	Per Gross Ton	
Heavy melting steel	$21.50 to	$22.00
No. 1 cast, cupola size	24.00 to	25.00
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va.; Franklin and Williamsport, Pa.	22.00 to	22.50
Compressed sheet steel	19.00 to	19.50
Bundled sheet sides and ends	17.00 to	17.50
Railroad knuckles and couplers	23.50 to	24.00
Railroad coil and leaf springs	23.50 to	24.00
Low phosphorus standard bloom and billet ends	25.00 to	26.00
Low phosphorus, plates and other grades	23.00 to	24.00
Railroad malleable	20.00 to	20.50
Iron car axles	28.00 to	30.00
Locomotive axles, steel	26.00 to	27.00
Steel car axles	24.00 to	25.00
Cast iron wheels	23.50 to	24.00
Rolled steel wheels	23.50 to	24.00
Machine shop turnings	15.00 to	15.50
Heavy steel axle turnings	17.50 to	18.00
Short shoveling turnings	17.00 to	17.50
Cast iron borings	17.00 to	17.50
Heavy breakable cast	19.50 to	20.00
Stove plate	17.00 to	17.50
Sheet bar crop ends	24.00 to	25.00
No. 1 railroad wrought	17.00 to	17.50

Chicago

Production Checked by Car Shortage, But Operations Have Increased

CHICAGO, Sept. 26.—The placing of rail tonnage is proceeding rapidly as the end of the month draws near. Western roads have practically completed negotiations calling for approximately 450,000 tons and the total is expected to reach 500,000 tons before the advanced price of $43 becomes effective. The closing of this business gives local mills a backlog in rails compared with their already heavy commitments in plates, shapes, bars, sheets and other products. The demand for the latter commodities is still of healthy proportions, although not so pressing as earlier in the month. Local mills are either sold up for the rest of the year or so nearly so that there remain only small tonnages of certain sizes which can be added to rolling schedules. Notwithstanding this situation, buyers are less concerned about securing prompt material and are showing a decreasing disposition to pay premiums asked by producers in a position to make early shipment. Users appear to be awaiting developments in the belief that increases in blast furnace and steel works production will relieve the present tension in the market.

It is true that production continues to expand. The Illinois Steel Co. has added a furnace at Joliet, giving it 15 active stacks out of its total of 29, and has increased its steel output to 71 per cent of ingot capacity. The operations of the Inland Steel Co. remain unchanged, but one additional merchant stack is now producing as a result of the blowing in of a second Iroquois furnace. Notwithstanding gains in output, however, producers are severely handicapped by car shortage. While the rules governing the use of open top cars were modified last week to permit shipments in the direction of the mines, the change had hardly been made when the old regulations were restored in all particulars. The result is that practically all open top cars are being used for the movement of coal. Cars with sides under 42 in. in height which may be used for shipping other commodities are exceedingly difficult to find, there being only approximately 85,000 of them in the entire country with the likelihood that many are in bad order. One important local steel interest is also experiencing trouble in obtaining cars at its coal mines with the consequence that output is being interrupted two and three days at a time. This difficulty, together with the congestion of finished material at the mill which is backing up for lack of cars, may force the company to curtail operations again. In some quarters, it is felt that the present car shortage is not so much a lack of cars as a scarcity of serviceable motive power. This idea seems to be borne out by the unusually large number of current orders and inquiries for locomotives.

Pig Iron.—The Steel & Tube Co. of America has blown in a second Iroquois furnace, thereby recovering the ground lost when it was forced to bank an Iroquois stack two weeks ago. This was made possible by improvement in coke production and it is hoped that output will continue to increase sufficiently to permit other merchant furnaces to resume. While pig iron production is better, shipments from furnace are impeded by car shortage. Inquiry is fairly active, but is largely for prompt material. Some forward business is being closed, however, one of the largest orders calling for approximately 2500 tons of foundry for fourth quarter delivery having been placed by a melter in the immediate vicinity. In a few instances, orders have been taken for first quarter shipment at present prices. Among current inquiries is one for 600 tons of foundry for fourth quarter from a Minnesota user. An unusual development was the recent shipment of a cargo of 5000 tons of merchant iron from the Zenith furnace by water to Buffalo and from there by rail to New England destinations. It will be recalled that earlier in the year two water shipments of Buffalo iron were unloaded in Chicago. Southern iron is still difficult to obtain owing to the transportation situation, but a few carloads are managing to get through from time to time and some slight progress toward improvement is being made. Southern quotations range from $27 to $28, Birmingham. The Southern stack which is able to take advantage of the combination water and rail rate is quoting $30.40, f.o.b. furnace, or $34.58, delivered Chicago. Charcoal, low phosphorous and silvery prices remain unchanged. A Michigan melter has closed for 250 tons of charcoal.

Quotations on Northern foundry, high phosphorus malleable and basic irons are f.o.b. local furnace and do not include a switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards, or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil 1.50, delivered at Chicago	$36.15
Northern coke, No. 1, sil. 2.25 to 2.75	33.00
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	32.06
Northern high phos	32.00
Southern No. 2	$33.00 to 35.00
Malleable, not over 2.25 sil	32.00
Basic	32.00
Low phos., Valley furnace, sil. 1 to 2 per cent copper free	38.00
Silvery, sil. 8 per cent	46.29

Ferroalloys.—The new tariff imposes a duty of $33.60 a ton on 80 per cent ferromanganese, but prices have not been definitely determined. Spiegeleisen and 50 per cent ferrosilicon remain unchanged, although it is possible that the tariff may later result in an advance of the latter commodity. Prices are nominal.

We quote 78 to 82 per cent ferromanganese, future, $75.06; prompt, $82.56, delivered; 50 per cent ferrosilicon, $55 delivered on contract and $65 prompt delivery; spiegeleisen, 18 to 22 per cent, $50, delivered.

Plates.—Heavy specifications continue to be received from car builders and tank works, but there has been a decline in new inquiry, particularly for prompt material. Local mills continue to quote 2.10c. to 2.30c., Chicago, but purchases from Eastern mills at higher delivered prices are falling off. Buyers are growing more cautious in their attitude, evidently in the hope that increasing mill production will halt the advancing tendency of prices. The Standard Oil Co. has placed six oil storage tanks, involving about 1500 tons, with the Chicago Bridge & Iron Works.

The mill quotation is 2.10c. to 2.34c., Chicago. Jobbers quote 2.90c. for plates out of stock.

Cast Iron Pipe.—Hanover, Ill., takes bids on 200 tons for 4- to 8-in. to-day. Marshalltown, Iowa, will readvertise for 140 tons. It is felt that considerable demand would materialize if transportation difficulties would clear up. While the railroad situation is slightly improved, it is still difficult to get shipments through from pipe shops, particularly from those located in the South.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $52.20 to $54.20; 6-in. and above, $48.20 to $50.20; class A and gas pipe, $3 extra.

Bars.—Demand for soft steel bars is widespread, but there is less pressure for material for prompt delivery. Leading local mills are quoting 2c. to 2.10c., Chicago, and while some business continues to be placed at higher prices, it involves less tonnage than two or three weeks ago. Buying by the automotive industry has shown little change, notwithstanding the temporary shutdown by the Ford company. The farm implement manufacturers remain the one source of business which is not buying its customary tonnage. Bar iron is firm, but quiet. Hard steel bar mills are well booked and are expected to advance prices in view of rising material costs.

Mill prices are: Mild steel bars, 2c. to 2.34c., Chicago; common bar iron, 2.25c. to 2.50c., Chicago; rail steel, 2c. to 2.10c., Chicago mill.

Jobbers quote 2.80c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.80c. for rounds and 4.30c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 2.50c. base; hoops, 3.90c.; bands, 3.55c.

Rails and Track Supplies.—In rails western roads have thus far placed 450,000 tons, with the likelihood that the total will reach 500,000 tons before the end of the month. The rail purchases are usually accompanied by orders for angle bars, which, like rails,

have been advanced, effective Oct. 1, the new price being 2.75c., mill, or $7 above the present quotation.

Standard Bessemer and open-hearth rails, $40; light rails rolled from new steel, 2.15c., f.o.b. makers' mills.
Standard railroad spikes, 2.85c. to 3c., mill; track bolts with square nuts, 3.85c. to 4c., mill; tie plates, steel and iron, 2.25c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.
Jobbers quote standard spikes out of warehouse at 3.50c. base and track bolts 4.50c. base.

Wire Products.—The leading producer has advanced wire nails, plain wire, annealed fence wire, galvanized wire and cement coated nails 10c. per 100 lb. and per keg respectively, and barbed wire and staples 20c. The new prices are still 5c. lower per product than those quoted by independents. Mill operations are improving slowly, but demand is still in excess of production. Demand is widespread, coming from all sections of the West and South, except Oklahoma and Arkansas. While the market is active, there is no doubt that much of the business now being placed represents accumulated needs which were not satisfied during the period of light production, from which the mills are now emerging. For mill prices, see finished iron and steel, f.o.b. Pittsburgh, page 837.

We quote warehouse prices, f.o.b. Chicago: No. 9 and heavier black annealed wire and No. 9 and heavier bright basic wire, $3.20 per 100 lb.; common wire nails, $3.35 per 100 lb.; cement coated nails, $2.75 per keg.

Bolts and Nuts.—To get the benefit of the old discounts, buyers are not permitting any of their material on contract to remain unspecified. This even holds true of farm implements manufacturers, who, while not particularly active, desire to secure a maximum of their requirements before advanced prices become effective. Business from the automotive industry shows no abatement. Confidence in the stability of the new discounts is indicated by a steady increase in the number of contracts closed for fourth quarter. Ruling discounts are those on page 837, except that the basing point is Chicago instead of Pittsburgh.

Jobbers quote structural rivets, 3.50c.; boiler rivets, 3.60c.; machine bolts up to ⅝ x 4 in., 50 per cent off; larger sizes, 50 off; carriage bolts up to ⅝ x 6 in., 45 off; larger sizes, 45 off; hot pressed nuts, squares and hexagons, tapped, $2.75 off; blank nuts, $2.75 off; coach or lag screws, gimlet points, square heads, 55 per cent off; quantity extras are unchanged.

Sheets.—Local mills are committed practically through the fourth quarter and are not entertaining inquiries for first quarter, although some have been received. Demand is less pressing than recently and sales at premium prices are becoming less frequent.

Mill quotations are 3.35c. to 3.50c. for No. 28 black, 2.50c. to 2.60c. for No. 10 blue annealed and 4.35c. to 4.50c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.
Jobbers quote f.o.b. Chicago, 4c. for blue annealed, 4.85c. for black and 5.85c. for galvanized.

Reinforcing Bars.—Inquiry for concrete bars is as heavy as at any time this year. Present activity is ascribed by some to the fact that many projects were held back pending a settlement of the strikes. Sellers are still hampered by difficulty in securing steel from the mills, but with production improving, relief is looked for. Recent awards include:

Corn Products Refining Co. plant, Pekin, Ill., 195 tons, to Concrete Steel Co.
Western Electric Co., wire plant, Hawthorne, Ill., 300 tons, to Paul J. Kalman Co.
Paddock Hotel, Beatrice, Neb., 200 tons, to Concrete Steel Co.

Pending business includes:

J. Sterling Morton High School, Cicero, Ill., 115 tons.
W. H. Hatch Grade School, Oak Park, Ill., 100 tons.
New Hotel Racine, Racine, Wis., 350 tons.
Juneau Park Surf Hotel, Milwaukee, 380 tons.
Fairmont Creamery Co., plant, Green Bay, Wis., 200 tons.

Structural Material.—Fabricating awards show a marked decline this week, but whether this is merely a temporary recession or portends a quiet autumn is not yet apparent. The mills continue to receive heavy specifications for plain material and fresh demand is of healthy proportions, but there is less willingness on the part of buyers to pay premiums to secure prompt delivery. Local producers continue to quote 2.10c. to 2.20c., Chicago.

The mill quotation on plain material is 2.10c. to 2.34c., Chicago. Jobbers quote 2.90c. for plain material out of warehouse.

Old Material.—The market has stiffened after the slump of last week and prices are returning to their former levels. Consumer buying is not yet brisk, but it has been of sufficient volume to bring out higher quotations. A few thousand tons of heavy melting and allied grades have been placed and malleable is notably in demand, but iron mill scrap is less active. The most important cause of recent weakness lay in the offerings of yard accumulations, which had been held for a profit. This material was quickly absorbed by sellers having short contracts and the appearance of lower prices discouraged further sales. It is apparent, however, that country stocks are heavier than was generally thought and that present prices warrant shipments from considerable distances. Purchases by local dealers include material situated at such widely scattered points as Memphis and Texas. Export offerings are still light. Among current lists are the Pennsylvania Northwestern Region, 2500 tons; the New York Central, a blind list, and the Chicago & Western Indiana and the Belt Railway of Chicago, 600 tons each.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton	
Iron rails	$25.00 to	$25.50
Cast iron car wheels	24.50 to	25.00
Relaying rails	27.50 to	32.50
Rolled or forged steel car wheels	23.00 to	23.50
Rails for rolling	20.00 to	20.50
Steel rails, less than 3 ft	21.50 to	22.00
Heavy melting steel	18.50 to	19.00
Frogs, switches and guards cut apart	18.50 to	19.00
Shoveling steel	18.25 to	18.75
Drop forge flashings	12.50 to	13.00
Hydraulic compressed sheet	15.25 to	15.75
Axle turnings	16.00 to	16.50
Per Net Ton		
Iron angles and splice bars	22.50 to	23.00
Steel angle bars	18.50 to	19.00
Iron arch bars and transoms	22.50 to	23.00
Iron car axles	25.50 to	26.00
Steel car axles	19.50 to	20.00
No. 1 busheling	15.50 to	16.00
No. 2 busheling	10.50 to	11.00
Cut forge	17.50 to	18.00
Pipes and flues	12.50 to	13.00
No. 1 railroad wrought	17.50 to	18.00
No. 2 railroad wrought	17.50 to	18.00
Steel knuckles and couplers	20.00 to	20.50
Coil springs	21.50 to	22.00
No. 1 machinery cast	21.00 to	21.50
No. 1 railroad cast	19.50 to	20.00
Low phos. punchings	17.00 to	17.50
Locomotive tires, smooth	18.50 to	19.00
Machine shop turnings	11.00 to	11.50
Cast borings	13.00 to	13.50
Stove plate	17.50 to	18.00
Grate bars	17.50 to	18.00
Brake shoes	17.50 to	18.00
Railroad malleable	22.00 to	22.50
Agricultural malleable	22.00 to	22.50

PROPOSED MERGER

Youngstown Sheet & Tube and Brier Hill Steel Co. May Be Combined

YOUNGSTOWN, OHIO, Sept. 26.—Directors of the Youngstown Sheet & Tube Co., at a prolonged meeting Tuesday afternoon, considered in detail a proposed merger with the Brier Hill Steel Co., operating plants at Youngstown, Warren and Niles. Upon the conclusion of the meeting, President James A. Campbell, of the Sheet & Tube company, stated it would be inadvisable at this time to make any public statement. He indicated, however, that while the Brier Hill company offered a valuable property, terms were not agreed upon.

Samuel Mather, of Cleveland, the largest individual stockholder in the Sheet & Tube company, sat in the meeting, as did John L. Severance and H. G. Dalton, other Cleveland directors.

It is understood the Brier Hill company seeks inclusion in a merger to avoid the expenditure of a large sum, approaching $8,000,000, to round out its finishing capacity. Brier Hill directors discussed the consolidation at a meeting Monday.

Sessions this week mark definite steps to effect a combination of the two interests, the largest independents in the Mahoning Valley. Additional conferences are being arranged to consider details.

Cleveland

Competition Develops Lower Prices on Pig Iron —Scrap Advances

With increased pig iron and steel production, the car shortage has become the predominating disturbing factor in the general situation. This is hampering the movement of both steel from the mills particularly from the Pittsburgh district and pig iron from the merchant furnaces. Some furnaces, behind in deliveries because of enforced shut downs, are compelled to lay part of their products on the ground because of an inadequate car supply. With Connellsville foundry coke it seems now to be more of a question of cars to move it than a supply of fuel. Pig iron production has further increased and as a result the acute shortage has to some extent been relieved and some easing up is noticed in the price situation in that prices lower than the recent maximum quotations have appeared on foundry iron. The Otis Steel Co. has blown in another Cleveland furnace and is now operating both stacks. The Girard furnace has gone in blast and the Struthers Furnace Co. stack at Struthers, Ohio, is scheduled to go in blast next week. The Hanna Furnace Co. started its Dover stack and its second Detroit stack late last week according to schedule.

Iron Ore.—Indications now are that Lake Superior ore shipments, during the present season, will amount to 40,000,000 tons and possibly 42,000,000 tons. Some early season estimates were that the movement would reach 45,000,000, but the curtailment of blast furnace operations caused some cutting off in shipments during the past few weeks and the late season's movement probably will be light. September shipments are expected to amount to 7,000,000 tons, making the movement to Oct. 1, approximately 33,000,000 tons. There is virtually no dock space left at Lake Erie ports. So nearly all of the ore is now going directly to furnace yards. Generally the car supply for ore is fair. Some of the railroads serving the southern Ohio districts have not been able to handle much ore, but conditions on these have improved during the past week.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, $5.95; Old range non-Bessemer, 51½ per cent iron, $5.20; Mesabi Bessemer, 55 per cent iron, $5.70; Mesabi non-Bessemer, 51½ per cent iron, $5.05.

Pig Iron.—An easing up in the pig iron situation is in evidence, particularly in respect to foundry iron as the result of the blowing in of an additional blast furnace and lower prices have appeared on foundry iron than the maximum quotations that had been the basis of recent Cleveland transactions for both local and outside sales. Local furnaces that have been quoting foundry iron at $36 are still asking that price, but evidently must name somewhat lower prices if they care to meet outside competition. The Westinghouse Electric & Mfg. Co., which was quoted $36 by Cleveland furnaces on 1050 tons of foundry iron for its Cleveland plant, has placed its order with a Valley furnace at a price of about $34, furnace, or $35.76, delivered, and another Cleveland consumer has purchased 100 tons of 2.75 silicon iron at $36, Valley furnace, or on a $34 basis, figuring the differential for high silicon at $2. Ruling quotations by another producer would mean a Cleveland delivered price on foundry iron of $35 or lower. One lake furnace is adhering to its recent range of from $32 to $33.50 on foundry iron. The market has quieted down materially, sales during the week being limited for most part to small lots, none exceeding 500 tons. Some foundries that have been buying spot iron because they were unable to secure shipments from their regular sources of supply will be able to get iron on their regular contracts shortly, and consequently the demand for spot iron is expected to fall off. Several sales of Southern iron are reported in lots up to 300 tons at the unchanged price of $28. One producer of silvery iron has advanced its price $1 per ton for prompt shipment and during the week sold two 150-ton lots of 9 per cent silvery at a base price of $42.50. Another producer made sales for the fourth quarter at $41.50. A small lot sale of imported low phosphorus iron has been made in Chicago at about $31 seaboard. This would be equivalent to about $37 Valley furnace, as compared with $38 quoted by a Valley producer.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and a $6 rate from Birmingham.

Basic, Valley furnace, nominal	$34.00
Northern No. 2 fdy., sil. 1.75 to 2.25	$35.00 to 36.50
Southern fdy., sil. 1.75 to 2.25	34.00
Malleable	36.00
Ohio silvery, sil. 8 per cent	44.52 to 45.52
Standard low phos., Valley furnace	38.00

Bolts, Nuts and Rivets.—With the partial settlement of the shopmen's strike many railroads have come in the market for bolts and nuts for the fourth quarter and considerable business is also being placed by jobbers and automobile manufacturers.

Finished Material.—There is a moderate volume of new business, but many consumers are more concerned about getting shipments on existing contracts than in placing new orders. Plates are in fairly heavy demand, but steel bar orders have fallen off. On steel bars and structural material, the bulk of the business is being placed at 2c., although some independent mills are still asking 2.25c. The plate market continues firm with quotations by independent mills ranging from 2.25c. to 2.50c., and small mills are booking considerable business at the latter price. A fairly heavy demand has developed from the railroads for fire box plates. Another lake freight boat has been placed, the Cleveland-Cliffs Iron Co. having closed the contract with the Great Lakes Engineering Works, Detroit, for a 600-foot boat that will require 5000 tons of steel. A new inquiry has come from an oil company for 600 tons of plates for stills. Structural inquiries have fallen off considerably. The only new project of any size reported is the store addition for the Halle Brothers Co., Cleveland, requiring 2500 tons of structural material. The Cleveland Frog & Crossing Co. is inquiring for 1000 tons of rails and some of the railroads in this district are negotiating for their 1923 requirements. The Nickel Plate Railroad has an inquiry out for its requirements in axles and steel bars for the last quarter and the first quarter of next year.

Jobbers quote steel bars, 2.92c.; plates and structural shapes, 3.01c.; No. 9 galvanized wire, 3c.; No. 9 annealed wire, 2.50c.; No. 28 black sheets, 4.50c.; No. 28 galvanized sheets, 5.50c.; No. 10 blue annealed sheets, 3.70c. to 3.76c.; hoops and bands, 3.71c.; cold-rolled rounds, 3.60c.; flats, squares and hexagons, 4.10c.

Reinforcing Bars.—There is a good demand for reinforcing bars in lots of 50 tons and under. The James Sperling Co., Bay City, Mich., has taken the contract for the filtration plant in that city requiring 1200 tons of bars. Hard steel reinforcing bars are firm at 2c.

Sheets.—The market is very firm and fairly active and some mills can make good deliveries. There is still considerable demand from the automobile industry. Prices range from 3.50c. to 3.60c. for black, 4.50c. to 4.60c. for galvanized, and from 2.60c. up on blue annealed. On heavier gages 2.70c. and on light gages 2.80c. are quite commonly quoted. Automobile body sheets are quoted at 5c. for October delivery.

Warehouse Business.—Cleveland jobbers advanced prices Monday $2 a ton on steel bars, plates, structural material, hoops and bands, and the leading steel jobbers to-day advanced black and galvanized sheets $5 a ton and blue annealed sheets $4 a ton. The new prices are based on mill prices of 1.95c. for steel bars, 2.05c. for plates and shapes, and 2.75c. for hoops and bands. The warehouse demand continues heavy, but sales have fallen off owing to depleted stocks.

Coke.—The foundry coke market is firmer. Car lot sales for prompt shipment are reported at $13, but some producers are now asking $13.50 to $14. Quotations of $13 have been made on a local inquiry for 1500 tons for the last quarter. We note the sale of ten cars of Indianapolis by-product foundry coke at $16.

Old Material.—Prices have further advanced $1 more a ton on most grades of scrap and the higher prices are bringing out very little material. Cleveland and Valley dealers are freely offering $22 for heavy melting steel and $20 for compressed steel for Youngs-

town delivery, and local producers have been offered as high as $20.50 for heavy melting steel. Locally, compressed steel has brought over $19. The high prices, together with the partial settlement of the shopmen's strike, are expected to bring out considerable railroad scrap during October. The only list that has appeared so far is a blank list from the Big Four Railroad, which offered no scrap in September. Bids on this will be taken Oct. 5.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel	$19.75 to $20.00
Steel rails under 3 ft	21.00 to 22.00
Steel rails, rerolling	24.00 to 25.00
Iron rails	18.00 to 18.50
Iron car axles	26.00 to 27.00
Low phosphorus melting	20.00 to 21.00
Cast borings	15.25 to 15.50
Machine shop turnings	14.00 to 14.25
Mixed borings and short turnings	14.75 to 15.25
Compressed steel	18.00 to 18.50
Railroad wrought	18.75 to 19.25
Railroad malleable	20.00 to 21.00
Light bundled sheet stampings	15.00 to 15.25
Steel axle turnings	16.00 to 16.50
No. 1 cast	21.00 to 22.00
No. 1 busheling	15.00 to 15.50
Drop forge flashings over 10 in.	14.50 to 15.00
Drop forge flashings under 10 in.	15.00 to 15.25
Railroad grate bars	17.00 to 18.00
Stove plate	17.00 to 18.00
Pipes and flues	14.50 to 14.75

Boston

More Domestic Pig Iron Sold in New England Than in Many Weeks

BOSTON, Sept. 26.—Sales of pig iron the past week approximated 5000 tons, including 1000 No. 2 plain special analysis Buffalo, last quarter, at about $33 furnace, to a local melter, 100 tons No. 2 western Pennsylvania, October delivery, at $33.50 furnace, or $39.42 delivered, and other small lots, Tennessee included, which swell the total to better than 1500 tons, the largest domestic iron business reported in many weeks. Scotch iron prices vary, being higher in some instances and lower in others. Advances are reported by the largest operators. A Bridgeport, Conn., melter bought silicon 2.25 to 2.75 at $30, c.i.f., with a $1.90 freight; a Massachusetts stove maker 400 tons at $31, while other sales ran as high as $32 plus the 75c. import tax duty, and $33 without the duty. English, to arrive, ranges from $27 to $31, plus duty. Continental, fairly low phosphorus and fairly high manganese, is offered as low as $24.50, plus duty, and better iron as high as $32. French iron is mostly $28 to $30. Importers are well cleaned up on October shipments. No foreign iron arrived in the week ending Sept. 23, but at least 1500 Scotch is due this week. One melter wants 300 to 600 tons No. 2X, delivery not specified, and the General Fire Extinguisher Co., Providence, R. I., 250 tons No. 1X, October shipment. Barges with 1315 tons of iron from Albany for the American Electrical Co., Phillipsdale, R. I., is in at Providence. The Philadelphia & Reading Railway announces that effective Oct. 16 the rate on pig iron at stations taking the Philadelphia and Scranton rate basis to points on the Maine Central Railroad taking the Brunswick rate basis, will be $4.28, as against $5.60 a ton as at present.

We quote delivered prices, on the basis of the latest reported sales, now infrequent, and as follows, having added to furnace prices $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75	$36.65 to $38.65
East. Penn., sil. 1.75 to 2.25	35.65 to 37.65
Buffalo, sil. 2.25 to 2.75	37.91 to 38.41
Buffalo, sil. 1.75 to 2.25	36.91 to 37.91
Alabama, sil. 2.25 to 2.75	38.10
Alabama, sil. 1.75 to 2.25	37.60
Virginia, sil. 2.25 to 2.75	38.92
Virginia, sil. 1.75 to 2.25	37.92

Ferroalloys.—Demand for ferroalloys in this territory is limited to pounds rather than tons, yet considerable activity exists at prices governed by those at more active centers. A lot of 1500 tons manganese ore arrived at this port from abroad the past week.

Warehouse Business.—Bookings the first half of this month averaged better than those for the corresponding period in August, which was the best month this year. Some let-down, more noticeable in structural steel than in other material, is reported since Sept. 15. Sheets are more active, however. Warehouse stocks are larger, due to increased mill shipments. Bolts and nuts also are coming forward more freely, some buyers claiming to have received stock not expected until December. Bolts, nuts and rivets are in demand, however, and mill shipments needed. Wire nails have advanced another 15c. a keg from stock, making 30c. since Sept. 1. The base is $3.60 a keg. Cut nails remain unchanged in price. Demand for nails is heavy and back orders are largest since war days.

Jobbers quote: Soft steel bars, $3.25 per 100 lb. base; flats, $3.85; concrete bars, $3.25; structural steel, $3.25 to $3.50; tire steel, $4.50 to $4.85; open-hearth spring steel, $5 to $6.50; crucible spring steel, $12; steel bands, $4.25; hoop steel, $4.75; cold rolled steel, $4 to $4.50; refined iron, $3.25; best refined iron, $4.50; Wayne iron, $5.50; Norway iron, $6 to $6.50; plates, $3.35 to $3.55; No. 10 blue annealed sheets, $4.15 per 100 lb. base; No. 28 black sheets, $5.40; No. 28 galvanized sheets, $6.40.

Cast Iron Pipe.—The Warren Foundry & Pipe Co. has been awarded 100 tons 6 in. and 8 in. pipe, November delivery, by the city of Attleboro, Mass., the only municipal business of any importance to be placed in this territory recently. Many feelers are being put out by cities and towns, however, as well as by gas and some of the largest engineering companies. Cast iron pipe makers expect considerable activity in the market during December, January and February for spring delivery. The market here for 6 in. pipe and larger is $57.10 delivered common Boston rate points, and for 4 in., $62.10. The usual $4 differentials apply to class A and gas pipe.

Finished Material.—The Boston & Maine Railroad this week closed on 17,000 tons of rails, 11,000 tons being 85 lb. and the rest 100 lb.; the Maine Central took 9300 tons, and other New England carriers, not including the New York, New Haven & Hartford and the Boston & Albany, which place their business through other than Boston sources, 7450 tons, making a total of 33,750 tons, 1923 delivery. Track accessory requirements by the carriers will not be placed until later. McClintic-Marshall Co. has taken 235 tons of structural steel for a Lowell, Mass., bridge, the only round tonnage placed in this territory the past week. Bids are in on 140 tons for the General Baking Co. garage, Charlestown, Boston. Bars, especially high carbon, are in excellent demand, although individual tonnages are only moderately large. The demand for plates still runs to small tonnages, but the number of orders is increasing. Fourth quarter sheet requirements have been mostly contracted for.

Coke.—Sales of Alabama by-product foundry coke were made at $16.50 delivered New England points the past week, contrasted with $19.50 heretofore. October deliveries are offered at $16.50. Small tonnages of Connellsville coke at $12.50 ovens, or $18.05 delivered, also were sold. The market for outside fuel is more or less restricted, however, due to better shipments against contracts by the New England Coal & Coke Co. and the Providence Gas Co. on a basis of $16.50 delivered within the prescribed freight zone. Local oven interests are now in a position to accept spot business at $19.50 delivered, but at that price sales are limited. Considerable coke made in this territory is going into New York State. Actual consumption of coke by New England foundries is expanding, but very slowly, and remains well below normal.

Old Material.—Continued activity, which broadened to include all old material on a rising scale of prices, was reported the past week. Strength was most pronounced in wrought pipe, cast iron borings and car axles, which average $2 a ton higher, and in heavy melting steel, car wheels, railroad malleable and stove plate, which average $1.50 higher. The car supply situation is more acute, while rejections are at a minimum. Local sales of heavy melting steel alone exceeded 1000 tons at $15 to $15.50, and 100 tons went at $15.75, a new high record price for this movement. Sales of chemical cast iron borings at $15, $15.50, $16, $16.50, $17 and even $17.50, shipping point, make it difficult to establish a general price level, which possibly is nearer $15 to $16.50 than otherwise. A Boston melter of rolling mill borings in the market at $15 delivered, which are

scarce, resorted to cast at $19 delivered. A local horseshoe interest wants round tonnages of horseshoes at $14, shipping point, a Maine rolling mill, having a $2.25 freight, is bidding $22 for shafting, while numerous inquiries for machinery cast are in dealers' hands. Otherwise most everything moving is going into Pennsylvania.

The following prices are for gross ton lots delivered consuming points:

No 1 machinery cast	$21.00 to $22.00
No. 2 machinery cast	19.00 to 20.00
Stove plate	17.50 to 18.00
Railroad malleable	17.50 to 18.00

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$15.00 to $15.50
No. 1 railroad wrought	15.50 to 16.00
No. 1 yard wrought	13.50 to 14.00
Wrought pipe (1 in. in diam., over 2 ft. long)	11.50 to 12.00
Machine shop turnings	10.50 to 11.00
Cast iron borings, rolling mill	12.50 to 13.00
Cast iron borings, chemical	15.00 to 16.50
Blast furnace borings and turnings	10.50 to 11.00
Forged scrap and bundled skeleton	10.50 to 11.00
Street car axles	21.00 to 22.00
Street car wheels	17.50 to 18.00
Rerolling rails	13.50 to 14.00
Shafting	18.50 to 19.75

Cincinnati

Quiet Week with Some Reselling of Southern Pig Iron at $26

CINCINNATI, Sept. 26.—The pig-iron market was exceptionally quiet during the week and only a few sales larger than 100 tons were reported. An Indiana melter bought 500 tons of Northern foundry iron on a basis of $32, Lake furnace, while another Indiana foundry took 300 tons of malleable at $32, Chicago. Several sales of Southern resale iron were made on the basis of $26, but this iron has now been cleared up and the Southern market is firm at $27, Birmingham. Very few furnaces are quoting for any delivery, the available supply of iron being very short, with shipments from Southern furnaces showing a slight improvement. Melters are waiting to see just what developments take place before buying further tonnages. The supply of foundry iron in the southern Ohio district has dwindled to practically nothing. The steel producer which had been supplying the bulk of the iron having gone back on basic. As a result, prices are very firm, and single carloads have brought as high as $34, base. Some Chicago and St. Louis iron is being shipped into this district as a result of the scarcity. But Lake furnaces are now in a position to take care of a bigger part of the trade. Belfont furnace resumed operations this week on Bessemer iron, which is being sold at $35, Ironton, and Jisco furnace will be making silvery at the end of the week. Those two will be the only merchant furnaces in blast in the southern Ohio district.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$31.05
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	31.55
Ohio silvery (nominal), 8 per cent	43.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	34.27
Basic Northern	32.27
Malleable	34.27

Finished Material.—The chief concern of the trade seems to be in securing shipments from mills. There are, however, a number of inquiries current for fourth quarter, the principal one coming from the Big Four Railroad, which will take bids on Oct. 5 for its fourth quarter requirements of bolts and nuts, iron bars, steel billets, firebox and boiler plates, tank and car plates, shapes and steel bars, black and blue annealed sheets, nails, wire, fence, axles, boiler tubes and safe ends. No quantities are specified on the order, but the requirements of the road for this quarter are expected to be heavy. While sheet mills continue to book only for October shipment at current prices, tonnage reservations which will take up the capacity of the mills are being booked at prices to be named shortly after the first of the month. It is expected that these prices will show a $3 advance for November and December shipment. The demand for small spikes is reported to be heavy, coming chiefly from the mining districts, and a steady improvement is also noted in the demand for light rails. Small spikes will likely advance to $3.50 shortly, as this seems to be the present ideas of some manufacturers. An advance of 10c. a keg on track spikes has been made by one manufacturer, bringing the price to $2.85. On bars and shapes, 2c. has been quoted during the week but a fair number of orders are being booked at 2.15c. to 2.25c. on bars, and 2.10c. on shapes. On plates, the general quotation appears to be 2.25c., though orders are confined to one and two carloads each. Some orders were reported for wire and wire nails, the latter being a rather scarce commodity these days, due to poor shipments from manufacturers. Inquiry in the structural field is light, though a number of projects involving a considerable tonnage of reinforcing bars are now in architects' hands. Included in these will be a 7-story office building for the railroad brotherhoods to be erected in Cincinnati, bids on which will be taken about Oct. 15. The Union Savings Bank & Trust Co. is having plans prepared for a 10-story office building, 100 x 200 ft., bids on which will be taken about Jan. 1. A number of smaller projects are also up. Two hundred tons of bars for the Liberty National Bank Building at Covington, Ky., will be supplied by the Bourne-Fuller Co.

Warehouse Business.—Local warehouses continue to enjoy a good business. Delayed shipments from mills are beginning to filter through, but the movement is still comparatively light. Prices show no change, although an advance of 15c. a keg on wire nails will become effective Oct. 1.

Cincinnati jobbers quote: Iron and steel bars, 2.95c. base; reinforcing bars, 3.05c. base; hoops, 4.05c. base; bands, 3.85c. base; shapes and plates, 3.05c. base; cold-rolled rounds, 3.75c. base; cold-rolled flats, squares and hexagons, 4.25c. base; No. 10 blue annealed sheets, 4c.; No. 28 black sheets, 4.70c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, $2.85 per 100 lb.; common wire nails, $3.05 per keg, base.

Tool Steel.—It is almost a certainty that tool steel prices will show an advance in the near future, and some good business was placed last week in anticipation of it. Prices range from 70c. per lb. on regular grades of high speed steel to 90c. on special brands of some companies.

Coke.—While the coke market is rather quiet, some fair sized sales of both furnace and foundry coke are reported. Prices are holding very firm, and furnace coke in particular is, if anything, higher. Connellsville furnace coke is quoted at $12, and foundry at $12 to $14. New River foundry remains at $14 to $15. Wise County furnace coke is quoted at $11 and foundry $13, the same range prevailing on Pocahontas. The Ashland by-product producer has advanced its price to $12, Connellsville basis for October shipment.

Old Material.—The local scrap market continues to show a fair amount of activity. Steel mills are buying in small tonnages and foundries are taking all cast scrap offered. The demand from other districts also is heavier. Prices are showing much strength and advances of from 50c. to $2 a ton are recorded.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

Per Gross Ton	
Bundled sheets	$9.50 to $10.00
Iron rails	15.50 to 16.00
Relaying rails, 50 lb. and up	26.50 to 27.00
Rails for rolling	16.50 to 17.00
Heavy melting steel	15.00 to 15.50
Steel rails for melting	14.00 to 14.50
Car wheels	19.00 to 19.50
Per Net Ton	
No. 1 railroad wrought	14.00 to 14.50
Cast borings	11.50 to 12.00
Steel turnings	10.50 to 11.00
Railroad cast	16.50 to 17.00
No. 1 machinery	20.50 to 21.00
Burnt scrap	11.50 to 12.00
Iron axles	20.50 to 21.00
Locomotive tires (smooth inside)	13.50 to 14.00
Pipes and flues	8.50 to 9.00

The Detroit Foundryman's Association held its monthly meeting Thursday evening, Sept. 21, at which Henry M. Lane, of the H. M. Lane Co., Detroit, foundry engineers, gave a talk on "Foundry Troubles." Officers of the association for the year are: Fred Erb, Packard Motor Car Co., president; J. C. Babo, Dodge Bros., vice-president; Delos R. Hay, secretary.

New York

Strong Pressure for Deliveries—Domestic Pig Iron Prices Lower

NEW YORK, Sept. 26.—The car situation in the coal mining districts of Pennsylvania is more serious and a number of mines have been compelled to close on account of inability to obtain cars in which to load the coal. The present outlook is that prices of coal will advance.

Pig Iron.—One firm reports the sale of 5,000 tons of English foundry irons and others have disposed of smaller tonnages. Prices of foreign grades show a tendency to advance. They are still several dollars below those of domestic irons, and transactions are confined to a large extent to the foreign product. Prices on domestic iron are somewhat lower and $31 can be done in eastern Pennsylvania and $32 in Buffalo on No. 2 plain. These prices are about $1 lower than the recent minimum quotations. In addition to purchases made by the American Locomotive Co., as announced in this column last week, it is still in the market for 700 tons of charcoal and 3500 tons of foundry iron for immediate delivery. The American Car & Foundry Co. has not yet placed the 500 tons for which it has been inquiring. Very little foreign iron is now available for delivery prior to Nov. 1.

We quote delivered in the New York district as follows, having added to furnace prices $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$35.27 to $36.27
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	34.27 to 35.27
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	33.27 to 34.27
Buffalo, sil. 1.75 to 2.25	36.91 to 37.91
No. 2 Virginia, sil. 1.75 to 2.25	No sales

Ferroalloys.—Thus far the new duties on various ferroalloys have made very little difference in quotations. Demand, however, has slackened in most of the markets. Sales of small lots of British ferromanganese have been made at $67.50, c.i.f., to which a duty of $33.60 per ton on 80 per cent alloy is now added. Domestic producers have practically nothing to sell, although it is stated that an offer of some alloy has been made at $100 per ton, furnace. This would figure about the same as the British alloy which, with duty paid, would be $101.10 at the seaboard. On spiegeleisen there is now a duty on the foreign product of 75c. per ton. Some sales of the 20 per cent alloy have been made at $39.25, duty paid, but the quotations on the domestic product are unchanged for both grades. No business is reported in the manganese ore market and quotations are nominal. The new tariff law places a duty of $22.40 per gross ton on 50 per cent ferrosilicon. Domestic producers have not yet changed their quotations, which range from $65 to $70 per ton, delivered, but are taking very little business, although there is some inquiry for car load lots. Importers of ferrosilicon are at present not quoting; their future policy and prices will be determined later. There is a new duty of 3c. per lb. of contained chromium in ferrochromium, but there is very little business in this market and quotations are still unchanged. Quotations are as follows:

Ferromanganese, domestic, furnace, nominal, per ton	$100.00
Ferromanganese, British, c.i.f., per ton	$67.50
Spiegeleisen, 17 to 19 per cent. furnace	$38.00
Spiegeleisen, 20 per cent. furnace	$38.00 to $39.00
Ferrosilicon, 50 per cent, delivered, per gross ton, carloads	$65.00 to $70.00
Ferrosilicon, 10 to 15 per cent, delivered, per gross ton	$38.00 to $40.00
Ferrotungsten, per lb. of contained metal	50c.
Ferrochromium 4 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr., delivered	14c.
Ferrovanadium, per lb. of contained vanadium	$3.50 to $4.00
Ferrocarbontitanium, 15 to 18 per cent, in carloads, per net ton	$200.00

Ores

Manganese ore, foreign, per unit, c.i.f.	29c. to 30c.
Tungsten ore, per unit, in 60 per cent concentrates, nominal	$3.50 up
Chrome ore, basis 48 per cent Cr_2O_3, crude, per ton, Atlantic seaboard	$18.00 to $18.50
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	50c. to 55c.

Warehouse Business.—Quotations have been advanced 10c. per 100 lb. in this district. Iron and steel bars are now 3.04c. per lb.; shapes, 3.14c. per lb.; plates, 3.14c. per lb.; hoops, 4.39c. per lb., and bands, 3.84c. per lb. Cold-rolled shafting and screw stock is 3.90c. per lb. for rounds and 4.40c. per lb. for flats, squares and hexagons.

Finished Iron and Steel.—Considerable pressure for deliveries indicates a continuing demand and the activity is broad in scope, save that there is some let-up in steel building work, this partly seasonal. Buying by jobbers is still noteworthy and shows how rapidly steel is going into consumption, seeing that minimum stocks in jobbers' hands are rarely more than 25 per cent below the maximum. Apparently all the rails for the Eastern railroads of the country have been bought or substantially closed. Concrete bar business is active, one office alone reporting some 5000 tons on which decisions have not been made. Among the active jobs are seven or eight buildings for a Government hospital at Northampton, Mass., involving 2000 tons. Railroad car and locomotive buying is still fairly active but very little railroad bridge work is under consideration. As to the immediate future in general terms, sellers of steel look for no cessation in demand for several months. Prices generally are higher in that the leading interest is apparently asking somewhat higher prices than recently for such business as it can entertain in view of its well filled order books; except to preferred customers, steel bars are a minimum at 2c., Pittsburgh basis, and shapes and plates 2.10c. The going market is $3 to $5 a ton higher for reasonably early delivery.

We quote for mill shipments, New York delivery, as follows: For indefinite delivery, soft steel bars, 2.34c.; structural shapes and steel plates, 2.44c.; for delivery in a number of weeks, soft steel bars and plain structural material, 2.44c. to 2.59c.; steel plates, 2.49c. to 2.59c.; bar iron, 2.59c.

High Speed Steel.—Although the market is generally quiet, some producers have advanced their quotations, pointing to the high percentage of increase in the cost of tungsten, effected by the tariff. Producers generally quote 18 per cent tungsten high speed steel at 75c. to 85c. per lb., with special brands of some companies ranging up to 90c. per lb.

Cast-Iron Pipe.—The situation in water pipe is unchanged. Prices are still strong, but new business is slow in appearing because of the usual seasonal dullness. Makers, however, are operating full. We quote per net, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $54.50; 4-in. and 5-in., $59; 3-in., $64.80, with $4 additional for Class A and gas pipe. The market in cast-iron soil pipe is active and makers report that present demand shows signs of lasting throughout the year. Jobbers stocks are low and with the present prices of pig iron, no weakening of present prices is expected. We quote per net ton, delivered, New York, discounts of both Southern and Northern makers, as follows: 2 to 6-in., standard, 25 to 30 per cent off list; heavy, 34 to 35 per cent off list.

Old Material.—The upward trend of prices continues, with active buying by all mills in both eastern and western Pennsylvania. Probably the greater portion of steel moving from this district is No. 1 heavy melting and is going to Bethlehem Steel Co. and the Alan Wood Iron & Steel Co., for which dealers are quoted as paying $17.50 per ton delivered.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard	$13.50 to $14.00
Steel rails, short lengths, or equivalent	14.50 to 15.00
Rails for rolling	14.50 to 15.00
Relaying rails, nominal	27.00 to 28.00
Steel car axles	17.00 to 18.00
Iron car axles	23.00 to 24.00
No. 1 railroad wrought	16.00 to 16.50
Wrought iron track	14.50 to 15.00
Forge fire	10.00 to 10.50
No. 1 yard wrought, long	13.00 to 13.50
Cast borings (clean)	12.50 to 13.00
Machine-shop turnings	11.50 to 12.00
Mixed borings and turnings	11.50 to 12.00
Iron and steel pipe (1 in. diam., not under 2 ft. long)	11.75 to 12.25
Stove plate	13.50 to 14.00
Locomotive grate bars	12.50 to 13.00
Malleable cast (railroad)	13.00 to 13.50
Cast-iron car wheels	14.50 to 15.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast	$19.50 to $20.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	17.00 to 17.50
No. 1 heavy cast, not cupola size	14.50 to 15.00
No. 2 cast (radiators, cast boilers, etc.)	13.00 to 13.50

San Francisco

Moderate Buying of Continental Pig Iron—Demand Not Urgent

SAN FRANCISCO, Sept. 20.

Pig Iron.—There has been a moderate volume of business in pig iron in the past two weeks, perhaps aggregating around 1000 tons for the ports of San Francisco and Los Angeles together. The majority of the contracts involve Continental iron, which is scheduled for September-October shipment. It is understood the price was in the neighborhood of $28, ex ship, Coast. Offerings of foreign material are liberally made, but the demand at present is not urgent, as consumers, for the most part, appear to have about sufficient stocks for their current needs. One special lot of foundry pig iron to be used for the making of ingot molds was in the market at something over $30.

Cast Iron Pipe.—Market conditions appear to be improving, and there is more interest on the buying side. While prices are unchanged at $52, delivered, for 6-in., the tone is firm. Private business is broader, it being reported by one large interest that in the last two-week period about 600 tons has been placed. Municipal business likewise has been better. Pasadena has just placed 800 tons of 4 to 12-in.; Santa Barbara awarded a contract for 1000 tons of 6 to 20-in., and Alhambra is in the market for a moderate quantity of 4 to 16-in. pipe. Demand for soil pipe continues steady, the most consistent call coming from house builders. The market price is unchanged.

Finished Iron and Steel.—The Coast market appears unsettled, and buyers are holding off from any great commitments, apparently believing that lower prices will follow the settlement of the strike situation. In some cases already, mills have eased their prices, but only in those instances where quotations were considerably in excess of the Steel Corporation levels. This development is due to several mills entering the market again after a period of inactivity, during which time fuel could not be secured. Plates are reflecting the price adjustment, those mills which were holding for 3c. to 3.15c., delivered, now asking from about 2.80 to 2.90c., against around 2.60c. from the largest makers.

Coke.—Business recently has been on a better scale, and it is estimated that around 2000 tons have been sold, virtually all of which is English. It is for September-October-November shipment. The price is understood to have ranged from $17 to $18, ex ship. The Navy has awarded its order to an importer, the price being around the equivalent of $17, ex ship.

Old Material.—Scrap generally is firmer as a result of limited amounts of materials in the market, and a somewhat improved demand from foundries, which have let their stocks dwindle to a very low point. Heavy melting is quoted around $12.50 a gross ton, delivered at consumers' works, with even higher prices heard. Holders are asking from $25 to $27 a net ton for heavy machinery scrap, and around $21 for light. A steady business, in small lots for the most part, is prevailing.

Buffalo

Prices of Pig Iron for Fourth Quarter Delivery Are Easier

BUFFALO, Sept. 26.—Sales of merchant pig iron are extremely light—in contrast with the big demand for steel products. Less than 2000 tons have been sold—the combined activities of all furnaces. The Lackawanna Steel mill, now owned by Bethlehem Steel Co., has four blast furnaces in operation and plans for a fifth. What the policy of the new organization will be with reference to selling pig iron has not been announced. The entry of the Lackawanna company into the merchant field was one of the last developments prior to the sale to Bethlehem. Lack of interest on the part of Eastern buyers in Buffalo iron is mainly due to the importation of foreign iron. Prices range from $32 to $34 for No. 2 plain for fourth quarter. The market for basic iron would be $34 if any of this grade were available and a buyer seeking 500 tons made this offer to a local furnace without success.

We quote f.o.b. per gross ton Buffalo as follows, the higher prices being for early shipment:

No. 1 foundry, 2.75 to 3.25 sil.	$34.00 to $35.00
No. 2X foundry, 2.25 to 2.75 sil.	32.00 to 34.00
No. 2 plain, 1.75 to 2.25 sil.	32.00 to 34.00
Basic	34.00
Malleable	34.00
Lake Superior charcoal	36.28

Finished Iron and Steel.—Bar orders are being taken more freely by several sellers, but the mills which these agencies represent are finding car and labor difficulties growing more serious with the fuel situation easier. The branch of an independent which was out of the market several months on bars, shapes and plates is now taking bar orders in a limited way and shape orders from established customers. On plates ¼ in. and heavier are being booked—without promise of delivery. This interest is quoting 2c. to 2.15c. on bars, 2c. on shapes and 2.25c. on plates. Tin plate buyers are interested in making contracts covering the last quarter and a few are inquiring for first quarter of 1923. The principal local tin plate seller has not booked any 1923 business to date. An independent interest which withdrew in August on pipe business is again able to consider orders from its regular trade and the same maker is nearer the point where it can consider bar specifications, but prices have not been fixed. Bolt prices now in effect are expected to stand throughout 1922. Structural business recently placed is for small tonnages and nothing exceeding 100 tons has come out.

We quote warehouse prices, Buffalo, as follows: Structural shapes, 3.10c.; plates, 2.90c.; soft steel bars, 3c.; hoops, 4c.; bands, 3.80c.; blue annealed sheets, No. 10 gage, 3.90c.; galvanized steel sheets, No. 28 gage, 5.85c.; black sheets, No. 28, 4.85c.; cold rolled round shafting, 3.95c.

Old Material.—Increased demand for heavy melting steel has brought the price up and sales at $18.50 to $19.50 have been made. Predictions are that it will go higher; all users being interested. No big tonnages are available. Demand for all grades of scrap is good and shortages in production of cast iron borings may bring about another advance in those prices.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel	$18.50 to $19.50
Low phos., 0.04 and under	20.00 to 21.00
No. 1 railroad wrought	18.00 to 19.00
Car wheels	21.00 to 22.00
Machine shop turnings	13.50 to 14.50
Cast iron borings	15.00 to 16.00
Heavy axle turnings	16.50 to 17.50
Grate bars	15.50 to 16.00
No 1 busheling	16.00 to 16.50
Stove plate	16.50 to 17.00
Bundled sheet stampings	12.50 to 13.00
No. 1 machinery cast	20.00
Hydraulic compressed	16.50 to 17.00
Railroad malleable	19.50 to 20.00

Birmingham

Sanitary Pipe Makers Buy Round Lots of Pig Iron at $27.50

BIRMINGHAM, ALA., Sept. 26.—Late Saturday and yesterday Southern sanitary pipe makers entered the market for fourth quarter iron and paid $27.50 for round lots aggregating from 10,000 to 12,000 tons. One maker turned down a firm offer for 5000 tons on account of filled condition of order books. Small tonnages for prompt delivery sold to-day for $28.50. Western iron buyers were in the city in numbers desperately seeking prompt shipment, only to meet disappointment. The car shops took on full forces during the week and this promises a better car supply soon. Strength of the market is indicated by sales of stored Alabama iron at Boston on a base of $28, Birmingham. St. Louis took some additional northern Alabama iron last week. That iron is being delivered without interruption through the Arrow Transportation Co. and the Burlington Railroad at the new rail and water rate of $3.28. Much

iron is being piled. One day last week one furnace interest piled every ton of make. Another piled 50 per cent of make. The Tennessee company blew in No. 1 furnace at Ensley and blew out No. 5 for relining, but the total make is larger because No. 1 is a 550-ton furnace and No. 5 a 350-ton stack. Wage advances in the district have been completed by awards made by the Gulf States Steel Co. and Anniston pipe shops, the 20 per cent advance of the Steel Corporation effective Sept. 1 being now in vogue in all collieries, furnaces and mills. The iron market bids fair to hang fire until cars are more plentiful.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	$27.00 to $28.00
Basic	27.00 to 28.00
Charcoal, warm blast	33.00 to 34.00

Finishing Mills.—The Tennessee company continues double turn at Bessemer, Ensley and Fairfield mills with a weekly production of 5000 tons of rails. Rapid progress has been made on the new 10 and 12-in. merchant bar mill at Fairfield. The following tonnages of Tennessee company products are scheduled to move out of the port of Mobile this week and next: 2500 tons of rails for Antefagasta, Chile; 2500 tons of duplex basic phosphate made by the Tennessee company at Ensley steel mills for New Zealand, and 6000 tons of rails, ammonium sulphate and other products for China, Korea and Japan. The last-named shipment will have similar tonnage and route of the Atlanta City, which left for the Orient last week. Practically full turn at the mills of the Conners Steel Co., the Gulf States Steel Co. and the American Steel & Wire Co. are reported. Cotton ties are in active demand.

Cast Iron Pipe.—The largest recent pressure pipe order is for 3000 tons placed by Los Angeles with the National Cast Iron Pipe Co. The United States Cast Iron Pipe & Foundry Co. has taken 1750 tons for Laporte, Ind., 1300 for Eloise, Mich., other Western orders and numerous small ones in the South. The base at the end of the week was $40, subject to rise if the next buying of the pipe makers is at present price of pig iron. Sanitary pipe still rules dull on account of cargoes en route, but prices are firm on base of $60 to $65.

Coal and Coke.—The Sloss-Sheffield Steel & Iron Co. moved its second shipment of 3000 tons of coke to New England via Charleston, S. C., last week. Coke is strong at $9 to $10 for spot deliveries.

Old Material.—The scrap market has been brisk and stocks in yards are running low. Shipments have been heavy to Chattanooga, Atlanta and Knoxville, as well as in the district.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails	$16.00 to $17.00
No. 1 steel	14.00 to 16.00
No. 1 cast	18.00 to 20.00
Car wheels	18.00 to 20.00
Tramcar wheels	17.00 to 19.00
Stove plate	16.00 to 17.00
Cast-iron borings	9.00 to 10.00
Machine shop turnings	9.00 to 10.00

St. Louis

General Withdrawal of Southern Furnaces from the Market—Foundries Busy

ST. LOUIS, Sept. 26.—Northern pig iron remains at $32, Chicago, while the market for Southern is at $27 to $28, Birmingham. Virtually all of the Southern makers are out of the market so far as this territory is concerned. Even the maker that has been shipping by water and rail has withdrawn from the market. No iron from the Chicago producing territory is to be had. There is an especially strong demand for high-silicon iron, of which there is a great scarcity all over the country. The Granite City maker, which has been operating on foundry iron for the last several weeks, went onto basic yesterday. Inquiries are good for iron outside of the St. Louis trade territory, but there is very little being done locally. All local mills and foundries are busy. Inquiries are pending for between 15,000 and 20,000 tons of basic for Ohio, Indiana and Wisconsin melters. Sales during the last week were not more than 1000 tons.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago and $3.28 from Birmingham (rail and water) and 81 cents average switching charge from Granite City:

Northern foundry, sil. 1.75 to 2.25	$32.16
Northern malleable, sil. 1.75 to 2.25	32.16
Basic	32.16
Southern foundry, sil. 1.75 to 2.25	$30.28 to 31.28

Finished Iron and Steel.—Railroads centering in St. Louis are looking to secure their rail requirements for next year. The Missouri, Kansas & Texas Railroad placed with various mills 10,000 tons of 90-lb. rails and the fastenings for June delivery. Their original intention was to place the business for August delivery. The Wabash wants 20,000 tons of 90-lb. rails for Eastern and Western lines, and it is expected that Buffalo mills will get some of the business. Men in the trade are expecting an inquiry from the St. Louis Southwestern shortly after the election of a president on Oct. 3. The Missouri, Kansas & Texas is in the market for fourth quarter requirements of boiler tubes. The Pennsylvania Car Co., Kansas City, is in the market for 430 tons of universal plates and channels. A car of structural steel now and then is being sold. The market for sheets is quiet. Production conditions are better and sales representatives have been told that their mills will take on some business.

For stock out of warehouse we quote: Soft steel bars 2.90c. per lb.; iron bars, 2.90c.; structural shapes, 3c.; tank plates, 3c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, cold rolled, one pass, 4.85c.; cold drawn rounds, shafting and screw stock, 3.90c.; structural rivets, 3.60c. per 100 lb.; boiler rivets, 3.70c.; tank rivets, $\frac{7}{8}$ in. and smaller, 60 per cent off list; machine bolts, large, 50 and 10 per cent; smaller, 50-10 and 10 per cent; carriage bolts, large, 55-5 per cent; small, 60 and 10 per cent; lag screws, 60 per cent; hot pressed nuts, square or hexagon blank, $3.50; and tapped, $3.25 off list.

Coke.—The demand for coke is still in excess of the supply, and prices are very strong. The by-product producers have been compelled to hold down their output on account of the inability to get coal as a result of the scarcity of cars at the mines. Collinsville coke is quoted at $15, but this is meaningless, as none is coming through. The St. Louis by-product concern is still out of the market, and the Granite City producer is out of the market on domestic coke for the first time since beginning operations. Their price on foundry coke is $14 at the furnace.

Old Material.—Melting and shoveling steel are easier, as the country dealers in the South are now beginning to offer more liberal tonnages than in the past. The mills are comfortably taken care of on these items for the next 60 days. There is a good demand for couplers, springs and wheels, and in face of higher prices no large tonnages are coming out. The American Steel Foundries was a heavy purchaser during the week of rails, couplers, knuckles, springs and wheels.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton

Old iron rails	$20.50 to $21.00
Rails for rolling	20.75 to 21.25
Steel rails, less than 3 ft.	20.00 to 20.50
Relaying rails, standard section	26.00 to 29.00
Cast iron car wheels	18.00 to 18.50
No. 1 heavy railroad melting steel	17.50 to 18.00
No. 1 heavy shoveling steel	17.50 to 18.00
Ordinary shoveling steel	17.50 to 18.00
Frogs, switches and guards cut apart	20.50 to 21.00

Per Net Ton

Heavy axles and tire turnings	12.75 to 13.25
Steel angle bars	18.00 to 18.50
Iron car axles	26.00 to 26.50
Steel car axles	21.00 to 21.50
Wrought iron bars and transoms	21.00 to 21.50
No. 1 railroad wrought	17.50 to 18.00
No. 2 railroad wrought	17.00 to 17.50
Railroad springs	21.00 to 21.50
Steel couplers and knuckles	21.00 to 21.50
Cast iron borings	11.00 to 11.50
No. 1 busheling	13.50 to 14.00
No. 1 railroad cast	21.50 to 22.00
Railroad malleable	19.75 to 20.25
Machine shop turnings	9.50 to 10.00

Directors of the Falcon Steel Co., Niles, Ohio, were re-elected Tuesday by stockholders at the annual meeting and declared the regular dividends.

Philadelphia

The Price Trend of Pig Iron and Finished Materials Is Downward

PHILADELPHIA, Sept. 26.—The buyer of pig iron and steel remains in a mood of hesitancy and is satisfying his wants on a hand-to-mouth basis. The only exception is in the railroad field, from which liberal orders are coming, particularly for locomotives. At the moment two leading locomotive builders are in the market for close to 20,000 tons of plates for locomotives that have already been ordered or are being figured on.

Ore.—Receipts of ore at the port of Philadelphia in the week ended last Saturday were 6000 tons of chrome ore and 2000 tons of manganese ore.

Pig Iron.—While foundry pig iron has not openly declined from the $32 base, which has been quoted the past two weeks, it is persistently reported that buyers have received quotations of $31.50, furnace, for No. 2 plain and $1 higher for No. 2 X. It is admitted that prices are slightly weaker, but sellers say that not enough desirable tonnage is in sight to bring about any marked reduction. In basic iron, however, the inquiry of an Eastern steel company for 10,000 tons or more has brought out at least one quotation of $28, furnace, while another furnace is reported to have quoted $30, delivered, equivalent to about $29, furnace. This business had not been closed to-day, but it was expected that orders would be placed before the end of the week. Foreign foundry iron continues to dominate the local market, and there is a tendency among some sellers to quote prices slightly below those recently named. Iron is coming in more freely, receipts at the port of Philadelphia for the week ended last Saturday being 1000 tons from England and 2500 tons from Scotland. Foreign low phosphorus iron, copper free, is now available at $30, c.i.f. Philadelphia.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia, and include freight rates varying from 76 cents to $1.64 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$33.26 to $35.64
East. Pa. No. 2X, 2.25 to 2.75	34.26 to 36.64
East. Pa. No. 1X	35.26 to 37.64
Virginia No. 2 plain, 1.75 to 2.25 sil.	37.17
Virginia No. 2X, 2.25 to 2.75 sil.	38.17
Basic delivered eastern Pa.	29.00 to 30.00
Gray forge	31.00 to 33.00
Malleable	34.00 to 35.00
Standard low phos. (f.o.b. furnace)	38.00 to 40.00
Copper bearing low phos. (f.o.b. furnace)	37.00 to 38.00

Ferroalloys.—It has been reported that British producers of ferromanganese would reduce their c.i.f. price for shipment to the United States, but agents here have received no notification to that effect as yet. The new tariff bill places a duty of $33.60 a ton on 80 per cent ferromanganese, a total price at seaboard of $101.10. Domestic producers have not named new prices, but their quotations will probably be about $100 a ton, f.o.b. furnace. It is expected that steel companies which can do so will use spiegeleisen in preference to ferromanganese, as the former is admissible with a duty of only 75c. a ton, and foreign spiegeleisen is being offered here at $39, seaboard, duty paid, for the 18 to 20 per cent grade. Imports of ferromanganese in the week ended last Saturday totaled 1905 tons. Ferrotungsten receipts amounted to 44,184 lb.

Plates.—The plate market has weakened to the extent that the peak price of 2.50c., Pittsburgh, which had been quoted by three or four Eastern mills, has practically disappeared and 2.25c. now appears to be the top of the market, with some business going at $2 or $3 a ton under this figure. The American Locomotive Co. is in the market for 10,000 to 12,000 tons of plates for locomotives recently booked and the Baldwin Locomotive Works will also require several thousand tons additional for some of its recent new business. Inquiries now pending or about to be quoted on involve more than 200 locomotives. The Baldwin Locomotive Works has been awarded 25 by the Atlantic Coast Line and 25 by the Lehigh Valley.

Structural Material.—The New York Shipbuilding Corporation will fabricate 1300 tons for the Fortieth Street bridge, Philadelphia. The Corn Exchange Bank, Philadelphia, will require 800 tons. The demand for plain material is not large. Prices remain unchanged at 2c. to 2.25c., Pittsburgh, the top price being less frequently quoted.

Bars.—Steel bars for shipment in 30 days are to be had at 2c., Pittsburgh, but the mill making this price is selecting only certain sizes which suit its rolling schedules. On mixed specifications such as jobbers' stock orders, 2.25c. is being paid in most instances. Bar iron is quoted at 2.25c., Pittsburgh, by most of the Eastern mills, but it is obtainable at 2.15c. in carloads and 2.25c. in less than carloads.

Wire Products.—The American Steel & Wire Co. has advanced wire nails to 2.70c. per lb. and plain wire to 2.45c., Pittsburgh. Some of the independents are quoting 5c. per 100 lb. higher.

Warehouse Business.—Following the action of the New York jobbers in advancing prices 10c. per 100 lb., the Philadelphia warehouses will announce similar advances this week. Until the change is made the following are the quotations for local delivery:

Soft steel bars and small shapes, 2.90c.; iron bars (except bands), 2.90c.; round edge iron, 3.10c.; round edge steel, iron finish, 1½ x ½ in., 3.10c.; round edge steel planished, 3.85c.; tank steel plates, ¼-in. and heavier, 3c.; tank steel plates, 3/16-in., 3.20c.; blue annealed steel sheets, No. 10 gage, 3.85c.; black sheets, No. 28 gage, 4.60c.; galvanized sheets, No. 28 gage, 5.75c.; square twisted and deformed steel bars, 3c.; structural shapes, 3c.; diamond pattern plates, ¼-in., 4.80c.; 3/16-in., 5c.; spring steel, 4.25c.; round cold-rolled steel, 3.85c.; squares and hexagons, cold-rolled steel, 4.35c.; steel hoops, No. 13 gage and lighter, 4.10c.; steel bands, No. 12 gage to 3/16-in., inclusive, 3.70c.; rails, 2.90c.; tool steel, 8.50c.; Norway iron, 5.50c.

Rails.—Only one rail reservation has been made so far by Eastern roads which do their purchasing in this district, the Philadelphia & Reading placing 13,000 tons with the Bethlehem Steel Co. and 2000 tons with Cambria Steel Co. Inquiries for rails are noted in another column.

Semi-Finished Steel.—One steel company is holding at $45 for rerolling billets and at $50 for forging billets, but these prices represent the top of the market and very little business can now be closed at that level. Other steel makers are quoting $40 for rerolling quality and $45 for forging quality, f.o.b. Pittsburgh.

Coke.—A sale of blast furnace coke for October shipment has been made at $11, Connellsville, which is also the price for spot carloads. Foundry coke from Connellsville is quoted at $12 or higher. By-product foundry coke is to be had at $13.50 to $14, Swedeland, Pa.

Old Material.—While lacking the liveliness of the past two weeks, the scrap market still presents a strong front, with further advances on some grades. The situation is complicated by shortage of cars. Railroads have in some instances asked shippers to use box cars, which make loading and unloading a more cumbersome job. It is the opinion of some in the trade that a good many shippers of scrap are using the car shortage as a pretext to avoid shipments on orders taken at prices lower than those now quoted.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$18.00 to $18.50
Scrap rails	18.00 to 18.50
Steel rails for rolling	21.00 to 22.00
No. 1 low phos., heavy 0.04 and under	25.50 to 26.00
Cast iron car wheels	23.00 to 24.00
No. 1 railroad wrought	22.00 to 23.00
No. 1 yard wrought	20.00 to 21.00
No. 1 forge fire	16.00 to 16.50
Bundled sheets (for steel works)	15.50 to 16.00
No. 1 busheling	15.50 to 16.00
Turnings (short shoveling grade for blast furnace use)	14.50 to 15.00
Mixed borings and turnings (for blast furnace use)	14.50 to 15.00
Machine-shop turnings (for steel works use)	16.00 to 16.50
Machine-shop turnings (for rolling mill use)	17.00 to 17.50
Heavy axle turnings (or equivalent)	17.00 to 17.50
Cast borings (for steel works and rolling mills)	16.50 to 17.50
Cast borings (for chemical plants)	23.00 to 25.00
No. 1 cast	23.00 to 24.00
Heavy breakable cast (for steel plants)	21.00 to 22.00
Railroad grate bars	17.00 to 17.50
Stove plate (for steel plant use)	17.00 to 17.50
Railroad malleable	15.50 to 16.50
Wrought iron and soft steel pipes and tubes (new specifications)	17.00 to 17.50
Shafting	25.00 to 28.00
Steel axles	30.00 to 31.00

British Iron and Steel Market

American Buying of British Pig Iron Has Raised Prices—Steel Prices Weakened by Near East Disturbances

(By Cable)

LONDON, ENGLAND, Sept. 26.

Pig iron is firm on continued American and Canadian demand; 10,000 tons of Cleveland No. 4 foundry iron has been sold to America. Dealers are cautious still as to relighting furnaces, but dearness of fuel is the main obstacle. Home consumers generally are awaiting developments.

Steel outlook is unsettled, due to the Near East disturbances. India has placed a few orders, but substantial demand from all quarters is lacking. Some works are competing keenly; others are holding aloof. Ebbw Vale collieries and steel works have been closed for an indefinite period, owing to labor disputes.

Continental markets generally are quiet. India, China and South America have made small purchases of merchant bars, plates and sections. Belgian nut and bolt bar iron has been sold at £8 7½s. (1.65c. per lb.) delivered Midlands. Rangoon is inquiring for wire nails. America is purchasing Continental pig iron.

Tin plate is weak on forced selling by some makers anxious to secure orders for October shipment, being sold at 18½s. ($4.10) basis f.o.b. Odd sizes have been sold to the home trade at 18½s. f.o.t.

Galvanized sheets are quiet. The Continent is inquiring for some for re-shipment. There is some revival of demand for Japanese specifications of black sheets, but bids generally are too low.

We quote per gross ton, except where otherwise stated, f.o.b. maker's works, with American equivalent figured at $4.42 per £1, as follows:

Durham coke, delivered	£1	7s.				$5.97	
Cleveland No. 1 foundry	4	17½				21.55	
Cleveland No. 3 foundry	4	12½	to	£4	15s.	20.44 to	$21.00
Cleveland No. 4 foundry	4	10				19.89	
Cleveland No. 4 forge	4	5				18.78	
Cleveland basic	4	0				17.68	
East Coast mixed	4	9	to	4	11	19.67 to	20.11
Ferromanganese	15	0				66.30	
Ferromanganese*	14	10	to	14	15	64.09 to	65.19
Rails, 60 lb. and up	7	5	to	8	0	32.04 to	35.36
Billets	7	2½	to	8	0	31.49 to	35.36
Sheet and tin plate bars, Welsh	7	7½				32.60	
Tin plates, base box	0	18½	to	0	19	4.10 to	4.20
						C. per Lb.	
Ship plates	8	10	to	9	0	1.68 to	1.78
Boiler plates	11	10	to	12	0	2.27 to	2.37
Tees	9	0	to	9	10	1.78 to	1.88
Channels	8	5	to	8	15	1.63 to	1.73
Beams	8	5	to	8	15	1.63 to	1.73
Round bars, ¾ to 3 in.	9	0	to	9	10	1.78 to	1.88
Galvanized sheets, 24 g.	16	5	to	16	10	3.21 to	3.26
Black sheets	12	0				2.37	
Steel hoops	11	0	&	11	10*	2.17 &	2.27*
Cold rolled steel strip, 20 g.	23	2½				4.56	
Cotton ties, Indian specifications	15	0				2.96	

*Export price.

Continental Prices, All F. O. B. Channel Ports, Delivery as Specified

No. 3 foundry pig iron:							
Belgium, October	£4	5s.				$18.78	
Luxemburg, October	4	5				18.78	
France, October	4	5				18.78	
Billets:							
France, Oct., Nov.	5	12½	to	£5	15s.	24.86 to	$25.41
Luxemb'g, Oct., Nov.	5	12½	to	5	15	24.86 to	25.41
Lorraine, Oct., Nov.	5	12½	to	5	15	24.86 to	25.41
Wire nails (keg basis):							
Germany	0	14½				3.20	
Belgium	0	20½				4.53	
Wire rods, 5 mm. (0.2 in.):							
Belgium	7	5	to	10	7½	32.04 to	45.86
						C. per Lb.	
Angles:							
Belgium, September	7	7½				1.45	
Tees:							
Belgium	8	5				1.63	
Merchant bars:							
Belgium, Nov., Dec.	7	10	to	7	12½	1.48 to	1.50
Luxemb'g, Nov., Dec.	7	10	to	7	15	1.48 to	1.53
France, Nov., Dec.	7	10	to	7	12½	1.48 to	1.50
Germany, Jan., Feb.	7	10				1.48	
Joists (beams):							
France, Oct., Nov.	6	12½	to	7		1.31 to	1.38
Belgium, Oct., Nov.	6	12½	to	7		1.31 to	1.38
Luxemb'g, Oct., Nov.	6	12½	to	7		1.31 to	1.38
Channels:							
Belgium	7	10	to	7	12½	1.48 to	1.50
⅜-in. plates:							
Germany, Nov., Dec.	8	0				1.58	
Belgium, Sept., Oct.	7	10	to	8	0	1.48 to	1.58
Luxemburg, Oct.	7	12½	to	7	15	1.50 to	1.53
France, not offered.							
⅛-in. plates:							
Germany	9	0				1.78	
No. 8 gage wire:							
Belgium, August	14	10⅝				2.87	

Business Conditions Viewed by Hardware Association

W. L. Niekamp, president American Iron, Steel and Heavy Hardware Association, was the guest of 20 odd members of that body at a luncheon at the Exchange Club, Boston, Sept. 18. F. H. Butts, Butts & Ordway Co., Boston, presided. The gathering represented a wide variety of business interests and each one present was asked to tell the condition of trade in his particular line of business.

Several interesting points were brought out during the informal talks, among them being the fact that August, in a very large majority of cases, was the best month in point of orders booked experienced in ten months. Screw manufacturers are experiencing difficulty in securing material for their product, have more business on their books than they can properly handle and expect a shortage of goods this winter. A car shortage that will seriously affect business this winter, which cannot be avoided under the most favorable conditions between now and Jan. 1, is facing the country, according to one of the best posted men in New England on railroad conditions. Sheets are moving out of jobbing hands in larger weekly tonnages than at any previous time this year, while there has been a slump in sales of structural steel. Stress was laid on the fact that employers of this country, unlike organized labor, have no leader whom all merchants will follow. It was asserted ha never before in our business history has there been a need for such leadership as today.

Program of Gear Makers' Meeting

An interesting program has been prepared for the semi-annual meeting of the American Gear Manufacturers' Association, which will be held at the Drake Hotel, Chicago, Oct. 9, 10 and 11. A paper that is expected to prove of unusual interest will be the one on "Standardization of Gear Sounds," to be presented by Prof. Daniel L. Rich of the University of Michigan. This paper will probably be read Tuesday afternoon. With the exception of the time of presenting this paper, the program has been completed. During the different sessions reports of the various sub-committees will be submitted. The program includes the following:

Monday, Oct. 9

Meeting of executive committee; reports of officers, committees, etc.

Address by George L. Markland, Jr., president Philadelphia Gear Works, on the "Evolution of the Gear."

Address by P. C. Molter, superintendent of department of industrial relations National Metal Trades Association, on "Apprenticeship."

Oct. 10

Address by Frank D. Hamlin, vice-president Earle Gear & Machine Co., Philadelphia, on "What the Association Needs from Committeemen after Nearly Six Years' Secretarial Observations."

Meeting of the industrial group to consider conditions in the industry, George L. Markland, Jr., presiding.

Address by L. G. Hewins, sales manager VanDorn & Dutton Co., Cleveland, on "Why Buy a Pig in a Poke?"

Meeting of automotive group to consider conditions in the industry, R. P. Johnson presiding.

An informal banquet, with J. B. Foote as toastmaster. Gen. John V. Clinnin will speak on "The World War and Its Effects on American Business," and Hon. Marcus Kavanagh, judge of the Supreme Court, Cook County, Illinois, will speak on "Capital and Labor."

Oct. 11

Address by Prof. A. E. White, director, department of engineering and research, University of Michigan, on "Engineering Research."

INTEREST SHOWN IN IMPORTS

Beside Pig Iron, Importers Able to Offer Billets, Bars, Wire Rods and Plates—Japan Buys Rails

NEW YORK, Sept. 26.—The export market continues extremely quiet, the small merchant buying in both Japan and China still being reported as going to Great Britain and the Continent. The Chinese market is featureless except for small purchases of copper. One interest here has sold some small orders of copper and a small tonnage of wire shorts to Chinese markets. There is also a slight interest in pipe both in China and Japan. Although inquiries for standard American brands of black sheets continue to appear, no sales are noted. The latest tender of the Imperial Government Railways, which was closed Sept. 15, calling for bids on 4800 tons of 60-lb. rails and 30,000 splice bars, was awarded to Suzuki & Co. An order from an electric railway for 14 miles of 20-lb. rails and 30 miles of 70-lb. rails went to Mitsui & Co. The Imperial Government Railways have also closed on 4000 tons of car couplers.

The greatest interest at present seems to lie in imports of foreign material rather than exports, although, according to reports, with the exception of foreign pig iron, imports have been small up to the present, and the new tariff may have a tendency to diminish them. Recently, one British importing and exporting interest, with a branch in New York, brought in a small tonnage of mild steel bars at Philadelphia, selling them at 1.80c per lb. landed and this same interest points out that it is in a position to quote billets of United Kingdom origin at as low as $31.11 per ton, c. i. f. New York, Philadelphia or Baltimore. Both wire rods and ship plates, provided there was any demand, this interest claims, could be brought in profitably at present prices. Pig iron, however, is the only commodity being imported in quantities.

Foreign pig iron continues to be quoted at several dollars per ton below the domestic product. The larger portion of the imports and contracts for shipment on foreign iron have undoubtedly been for pig iron of British origin, although Continental iron—Belgian, Luxemburg and French—has played no small part in buying. At present Continental iron can be brought in at about $27 per ton, c. i. f. New York on foundry grades, according to one fairly large importer. German pig iron, very little of which has been offered as far as can be ascertained, is said by one importer, who has been dealing with British sellers, to be available at about $25, c. i. f. New York. The iron on this offer analyzed: Sil., 1.75 to 2.25 per cent; phos., 0.04 to 0.06 per cent; sul., 0.04 maximum and man., 1.5 to 2.25 per cent.

There is evident a slight range of quotations between different importers of British iron. One small importer states that No. 3 Scotch foundry iron can be obtained at £6 per ton, c. i. f. New York, Philadelphia, or Baltimore, while another interest, which represents a large number of British furnaces, quotes £6 10s. per ton, c. i. f. on all foundry grades, regardless of silicon content. On steel making iron this importer quotes £5 18s. per ton, c. i. f. These prices would be slightly increased on shipments to Boston, as the ocean freight to that port from the United Kingdom is about 2s. per ton higher.

An importing interest, which claims to have recently delivered or to have in transit or under contract for delivery pig iron, the greater part of which is British foundry grade, totaling about 180,000 tons, estimates recent purchases of foreign iron of all kinds at an unusually high figure. Another importer, however, discounts recent high estimates considerably, pointing out that there has been a tendency to overestimate through duplication of the tonnage when it passes through several hands.

While practically all British furnaces report themselves out of the market on October shipments of iron, the first bookings possible in almost all cases being for November or December shipment, it is explained by importers in close touch with the situation in England, that the recent demand from the United States stimulated speculation and that there are undoubtedly some fair-sized tonnages booked for delivery to speculators in October, which may be released for export.

Program of Drop Forging Convention

The program of the convention of the American Drop Forging Institute, to be held in the General Motors Building, Detroit, next week, is in part as follows:

Tuesday, Oct. 3

11 a. m.—President's address, by J. H. Williams, president J. H. Williams & Co., Brooklyn.

2 p. m.—Business session—
The Drop Forging Industry, by F. A. Ingalls, vice-president Ingalls-Shepard division of Wyman-Gordon Co.
Business Trends in the Drop Forging Industry, with charts, by Scovell, Wellington & Co., commissioners of the association.
Suggestions for Institute Research Work, by Jules Dierckx, Keller Mechanical Engraving Co., Brooklyn.
How Supply Men Can Co-operate, by H. N. Taylor, president N. & G. Taylor Co., Philadelphia.

9 p. m.—Smoker and entertainment, arranged by American Society for Steel Treating.

Wednesday, Oct. 4

10 a. m.—Joint session with American Society for Steel Treating.

2 p. m.—Open session—
Some Fundamentals with Respect to the Labor Question, by Walter Gordon Merritt, organizer and counsel of the League for Industrial Rights, New York.
The Menace of the Sherman Act to This Country, and How It Should Be Amended, by Felix H. Levy, special assistant to the Department of Justice under President Roosevelt, New York.

Thursday, Oct. 5

10 a. m.—Business session—
Symposium on Drop Forging Cost Methods, by cost committee, J. B. Sehl, chairman, second vice-president Billing & Spencer Co., Hartford, Conn.; C. C. Winn, assistant treasurer Wyman-Gordon Co., Worcester, Mass., and F. S. Hatch, assistant treasurer Moore Drop Forging Co., Springfield, Mass.
Forging Furnace Construction, by H. Johnson, engineer, Ingalls-Shepard division, Wyman-Gordon Co., Harvey, Ill.
Power Plant Costs in Operating Steam Hammers, by R. E. Waldron, chief engineer Dominion Forge & Stamping Co., Walkerville, Ont.

2 p. m.—Business session—
Ideal Die Shop, by O. F. Transue, president and general manager Transue & Williams Steel Forging Corporation, Alliance, Ohio.
Flow of Metal in Forgings, by L. A. Danse, Cadillac Motor Car Co.
Field for Upsetters in the Drop Forging Industry and Comparison Between Board and Steam Drop Hammers, by representatives of the Drop Forge Supply Association.

7 p. m.—Banquet of American Drop Forging Institute, Drop Forge Supply Association, and American Society for Steel Treating.

Friday, Oct. 6

10 a. m.—Session for executive members of American Drop Forging Institute only.

Proposed Lower Rates on Pig Iron

WASHINGTON, Sept. 26.—Lower rates on pig iron from Virginia furnaces to Cincinnati and Lexington, Ky., and on imported iron ore to St. Louis and East St. Louis are proposed in a tariff filed with the Interstate Commerce Commission. The Chesapeake & Ohio, Norfolk & Western and Virginian railroads have filed tariff, proposed to be effective Oct. 27, establishing a rate of $3.95 per gross ton on pig iron from Virginia furnaces to Cincinnati and $4.42 from the same furnaces to Lexington. The present rates are $4.41 and $5.04, respectively.

The tariff proposing a lower rate on imported iron ore except from Canadian and New England, effective Oct. 25, calls for a rate of $5.48 per gross ton to St. Louis and East St. Louis from the following ports of Virginia: Lambert's Point, Newport News, Norfolk, Pinner Point, Portsmouth and West Norfolk. The present rate is $6.35.

High Price for Heavy Melting Steel

YOUNGSTOWN, OHIO, Sept. 26.—Heavy melting scrap sold in the Mahoning Valley this week at $23, a new high in the current movement. Firm prices are attributed to high operating rate of open-hearth furnaces and inability of railroads to make deliveries as usual, owing to pressure of other freight movement. Decline in offerings by the carriers has also compelled consumers to bid up the market.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Plates

Sheared, tank quality, base, per lb.....2.00c. to 2.50c.

Structural Material

Beams, channels, etc.....2.00c. to 2.25c.

Iron and Steel Bars

Soft steel bars, base, per lb.....2c. to 2.25c.
Refined iron bars, base, per lb.....2.50c.

Hot-Rolled Flats

Hoops, base, per lb.....2.75c. to 3c.
Bands, base, per lb.....2.75c. to 3c.
Strips, base, per lb.....2.75c. to 3c.
Cotton ties, per bundle of 45 lb.....$1.12

Cold-Finished Steels

Bars and shafting, base, per lb.....2.50c.
Strips, base, per lb.....4.25c. to 4.50c.

Wire Products

Nails, base, per keg.....$2.70
Bright plain wire, base, per 100 lb..... 2.45
Annealed fence wire, base, per 100 lb.....$2.45 to 2.50
Galvanized wire, base, per 100 lb..... 2.95 to 3.00
Galvanized barbed, base, per 100 lb..... 3.35
Galvanized staples, base, per keg..... 3.35
Painted barbed wire, base, per 100 lb..... 2.85
Polished staples, base, per keg..... 2.85
Cement coated nails, base, per count keg..... 2.20
Woven fence, carloads (to jobbers).....70½ per cent off list
Woven fence, carloads (to retailers).....68 per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads.60 and 10 per cent off list
Machine bolts, small, cut threads.50, 10 and 10 per cent off list
Machine bolts, larger and longer..50, 10 and 10 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads, 50, 10 and 10 per cent off list
Cut threads .....50 and 10 per cent off list
Longer and larger sizes.....50 and 10 per cent off list
Lag bolts .....60 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.:
Smaller and shorter.....45 and 10 per cent off list
Larger and longer sizes.....45 and 10 per cent off list
Hot pressed square or hex. blank nuts.....$3.75 off list
Hot pressed nuts, tapped..... 3.75 off list
C.p.c. and t. sq. or hex. nuts, blank..... 3.75 off list
C.p.c. and t. sq. or hex. nuts, tapped..... 3.75 off list
Semi-finished hex. nuts:
9/16 in. and smaller, U. S. S.....80 per cent off list
⅝ in. and larger, U. S. S.....75 per cent off list
Small sizes, S. A. E.....80 and 10 per cent off list
S. A. E., ⅝ in. and larger.....75 and 10 per cent off list
Stove bolts in packages.....80 and 5 per cent off list
Stove bolts in bulk.....80, 5 and 2½ per cent off list
Tire bolts .....50, 10 and 10 per cent off list

Cap and Set Screws

Milled square and hex. head cap screws....75 per cent off list
Milled set screws.....75 per cent off list
Upset cap screws.....75 and 10 per cent off list
Upset set screws.....80 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb.....$3.00
Large boiler rivets, base, per 100 lb..... 3.10
Small rivets .....65 to 65 and 5 per cent off list

Track Equipment

Spikes, 9/16 in. and larger, base, per 100 lb....$2.75 to $2.85
Spikes, ½ in. and smaller, base, per 100 lb..... 3.25 to 3.75
Spikes, boat and barge, base, per 100 lb..... 3.25 to 3.75
Track bolts, base, per 100 lb..... 3.85 to 4.50
Tie plates, per 100 lb..... 2.25 to 2.50
Angle bars, base, per 100 lb..... 2.40

Welded Pipe

Butt Weld

Steel Inches	Steel Black	Steel Galv.	Iron Inches	Iron Black	Iron Galv.
⅛	51½	26	¼ to ⅜	+7	+33
¼ to ⅜	57	31½	½	26	8
½	62	43½	¾	32	17
¾	66	54½	1 to 1½	34	19
1 to 3	68	56½			

Lap Weld

2	61	49½	2	29	15
2½ to 6	65	53½	2½ to 6	32½	19
7 to 8	62	49½	7 to 12	30	17
9 to 12	61	48½			

Butt Weld, extra strong, plain ends

⅛	47½	31	¼ to ⅜	+15	+48
¼ to ⅜	53	36½	½	25	13
½	59	48½	¾	32	18
¾	64	53½	1 to 1½	34	20
1 to 1½	66	55½			
2 to 3	67	56½			

Lap Weld extra strong, plain ends

2	59	48½	2	30	17
2½ to 4	63	52½	2½ to 4	33	21
4½ to 6	62	51½	4½ to 6	32	20
7 to 8	58	45½	7 to 8	25	13
9 to 12	52	39½	9 to 12	20	8

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 and 2½ per cent.

Boiler Tubes

Lap Welded Steel

1¾ in.	23½
2 to 2¼ in.	38
2½ to 3 in.	49
3¼ to 13 in.	54

Charcoal Iron

1½ in.	+2
1¾ to 1⅞ in.	8
2 to 2¼ in.	18
2½ to 3 in.	23
3¼ to 4½ in.	25

To large buyers of steel tubes a supplementary discount of 5 per cent is allowed.

Standard Commercial Seamless Boiler Tubes

Discounts on cold-drawn tubes in carload lots, f.o.b. Pittsburgh, follow:

1 in.	57	2½ and 2¾ in.	40
1¼ and 1½ in.	49	3 in.	44
1¾ in.	33	3¼ to 4 in.	49
2 and 2¼ in.	36	4¼ in. and 5 in.	41

Hot Rolled

3 in.	46	3¼ to 4 in.	51

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30, base, 85 per cent off list. Carbon 0.30 to 0.40, base, 83 per cent off list. Plus usual differentials and extras for cutting.

Seamless Locomotive and Superheater Tubes

Cents per Ft.		Cents per Ft.	
2-in. O.D.	12 gage	2¼-in. O.D.	10 gage....17¾
2-in. O.D.	11 gage....14	3-in. O.D.	7 gage.....33
2-in. O.D.	10 gage.....15	1½-in. O.D.	9 gage.....13
2½-in. O.D.	12 gage....15	5⅜-in. O.D.	9 gage.....51
2¼-in. O.D.	11 gage....16	5½-in. O.D.	9 gage.....53

Tin Plate

Standard cokes, per base box.....$4.75

Terne Plate

(Per package, 200-lb.)

8-lb. coating	$9.30	25-lb. coating I. C.	$14.25
8-lb. coating I. C.	9.60	30-lb. coating I. C.	15.25
15-lb. coating I. C.	11.80	35-lb. coating I. C.	16.25
20-lb. coating I. C.	13.00	40-lb. coating I. C.	17.25

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....2.50c. to 2.75c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.35c. to 3.75c.

Galvanized

No. 28 (base), per lb.....4.35c. to 4.75c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.35c. to 3.50c.

Manufacturers have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic.	$0.325	Buffalo	$0.265	St. Louis	$0.43
Philadelphia, export...	0.235	Cleveland	0.215	Kansas City	0.735
Baltimore, domestic...	0.315	Cleveland, Youngstown		Kansas City (pipe)...	0.705
Baltimore, export....	0.225	Comb.	0.19	St. Paul	0.595
New York, domestic...	0.34	Detroit	0.295	Omaha	0.735
New York, export....	0.255	Cincinnati	0.295	Omaha (pipe)	0.705
Boston, domestic	0.365	Indianapolis	0.31	Denver	1.275
Boston, export	0.255	Chicago	0.34	Denver (pipe)	1.215

Pacific Coast	$1.50		
Pac. Coast, ship plates	1.20		
Birmingham	0.69		
Memphis	0.385		
Jacksonville, all rail..	0.50		
Jacksonville, rail and water	0.415		
New Orleans	0.515		

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 30c. to 40c.; ship plates, 30c. to 40c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 30c. to 40c.; sheets and tin plates, 50c.; rods, wire rope, cable and strands, 75c.; wire fencing, netting and stretcher, 50c.; pipe, not over 8 in. in diameter, 50c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

STEEL RAIL ACTIVITY

Over One Million Tons, Bought or Reserved, Indicated for First Half Next Year

Including the 250,000 tons for the New York Central, the Norfolk & Western, the Long Island and the Reading, mentioned last week, known items of rail purchases and rail reservations for the first half of 1923 indicate a total for the country of considerably over 1,000,000 tons. All this has been consummated practically in two weeks of September, or before the advance from $40 to $43 per ton taking effect on Oct. 1. The appended list shows 410,000 tons closed or closing in the Chicago territory, 575,000 tons closed or closing in the East, and a number of the leading roads yet to be heard from. Following is a brief tabulation of the current rail business:

Union Pacific has purchased 40,000 tons from Illinois Steel Co. and 20,000 tons from Colorado Fuel & Iron Co., a total of 60,000 tons.

The Great Northern has placed 10,000 tons with the Illinois Steel Co. and 5000 tons each with the Inland Steel Co. and the Lackawanna mill of the Bethelehem Steel Co., a total of 20,000 tons.

The Atchison, Topeka & Santa Fe has ordered 25,000 tons each from Illinois Steel Co. and Colorado Fuel & Iron Co., 11,000 tons from Inland Steel Co. and 3000 tons from Bethlehem Steel Co., a total of 64,000 tons.

The Chicago, Burlington & Quincy has ordered 15,000 tons from Illinois Steel Co. but expects to make additional reservations.

The Chicago & Eastern Illinois has reserved space with Illinois Steel Co. for 5000 tons.

The Chicago, Indianapolis & Louisville has placed 3000 tons with the Illinois mill.

The Chicago & Alton has made reservations for approximately 8000 tons.

The Chicago, Rock Island & Pacific has reserved space for 40,000 tons with Illinois Steel Co.

The Chicago, Milwaukee & St. Paul is about to close for 50,000 tons. It placed an order some time ago with the Lackawanna Steel Co. for 5000 tons for delivery this fall.

Joint orders of the Chicago & Northwestern and the Chicago, St. Paul, Minneapolis & Omaha will probably total 50,000 tons.

The Illinois Central is about to close, or has closed, for 60,000 tons.

The Northern Pacific is understood to have contracted for 35,000 tons.

The Philadelphia & Reading Railroad has placed 13,000 tons with the Bethlehem Steel Co. and 2000 tons with the Cambria Steel Co.

The Baltimore & Ohio Railroad will require 35,000 tons.

The Chesapeake & Ohio's inquiry calls for 20,000 tons.

The Southern Railway is in the market for 25,000 tons.

The Pennsylvania Railroad will probably require 80,000 to 100,000 tons, but no formal inquiry has been issued.

The Western Maryland wants 2000 tons.

The Pere Marquette has inquired for 13,000 tons.

The Grand Trunk has asked bids on 10,000 tons for delivery at Detroit and Portland, Me.

The Hocking Valley wants 4600 tons.

The Bangor & Aroostook calls for 1500 to 2000 tons.

The Erie has covered for 40,000 tons.

The Boston & Maine total is put at 15,000 tons.

The New Haven's needs call for 25,000 tons.

The Maine Central is likely to close for 7,500 tons.

The Delaware, Lackawanna & Western is understood to have covered for 15,000 tons.

The Lehigh Valley's total is understood to be 20,000 tons.

The Delaware & Hudson has arranged for 10,000 to 20,000 tons.

RAILROAD EQUIPMENT BUYING

Orders and Inquiries for Locomotives Continue in Large Volume

Large locomotive orders have been placed within the past week and pending inquiries, with business that is expected to develop shortly, involve several hundred additional. Car business is improving, but is not on a parity with the activity in the locomotive field. Some of the more important items of business follow:

The Baltimore & Ohio has ordered 1000 hopper cars of 55 tons capacity from the American Car & Foundry Co.

The Grand Trunk has placed 250 refrigerator cars with the American Car & Foundry Co.

The Chicago & Northwestern is inquiring for 200 flat and 800 gondola cars.

The Hocking Valley is inquiring for 800 freight cars of various types.

The Rock Island is expected to enter the market for 2500 freight cars and has already issued inquiries for 30 Mikado type and 10 mountain type engines.

The Texas & Pacific has placed 8 Pacific type and 8 switch engines with the American Locomotive Co.

The Santa Fe is inquiring for 75 locomotives.

The Northern Pacific contemplates entering the market for 50 to 80 engines and the Great Northern and the Cotton Belt also expect to inquire for power.

The New York Central, which recently made two successive purchases of 150 and 90 engines, respectively, is expected to place 50 more presently and another 50 shortly thereafter.

The Virginian Railroad is in the market for 10 Mallet type engines.

The Lehigh Valley Railroad has placed 25 locomotives with the Baldwin Locomotive Works.

The Atlantic Coast Line has ordered 25 locomotives from the Baldwin Locomotive Works.

In addition to the 12 locomotives ordered by the Norfolk & Western from the Baldwin Locomotive Works, reported last week, 30 have been placed by the same road with the American Locomotive Co.

The Chicago, Burlington & Quincy will have an inquiry out in a few days for 50 locomotives.

The Maine Central Railroad has inquired for 12 passenger locomotives.

The Chesapeake & Ohio Railroad has placed 25 Mallet type locomotives with the American Locomotive Co.

The Delaware, Lackawanna & Western has ordered 15 Mikado type locomotives from the American Locomotive Co.

The St. Louis-San Francisco has placed 500 50-ton hopper cars with the Pullman Co., 1000 50-ton hopper cars with Chickasaw Shipbuilding & Car Co., 1200 40-ton box cars with the American Car & Foundry Co., and 300 40-ton stock cars with the Mount Vernon Car Mfg. Co.

The Texas & Pacific has ordered 150 tank cars from the American Car & Foundry Co.

The Atlantic Coast Line is in the market for 2000 box cars.

The Maine Central is in the market for 350 box cars, 350 open rack, 50 general service cars and 10 dairy products cars.

The Detroit, Toledo & Ironton is inquiring for 500 to 1000 hopper cars.

The Pittsburgh, Shawmut & Northern is planning to buy 200 stock cars, 50 box cars and 150 to 200 stock car bodies.

The West Penn Power Co. bought 50 hopper cars from the American Car & Foundry Co.

Large Railroad Inquiry from Argentina

WASHINGTON, Sept. 26.—A cablegram to the Department of Commerce states that La Plata Meridiano Railroad, owned and operated by the Province of Buenos Aires, Argentina, has been authorized to construct and equip 650 kilometers of new lines provided proper financial arrangements can be made. Originally bids were to be opened on Oct. 31, but the date has been put off to Dec. 31. Some of the equipment includes 44,300 tons of 31 kg. rails, 470 30-ton closed freight cars, 30 30-ton half box cars, 50 30-ton flat cars, 130 30-ton cattle cars, 27 Pacific type locomotives, 10 first class American type passenger cars, 10 second class American type passenger cars, 39 baggage cars, machinery to equip the shops and numerous miscellaneous items.

Fabricated Steel Business

Inquiries for structural steel work now being figured on include the following:

Miscellaneous bridge work, New York Central, 600 tons.

Machine shop for the Pennsylvania Railroad at Juniata, 3000 tons.

Plate girder bridge work for the Virginian Railway, 300 tons.

Corn Products Refining Co., Pekin, Ill., plant addition, 600 tons.

Allerton Hotel, Chicago, 2300 tons, bids in.

Addition to First National Bank Building, Chicago, 1600 tons, bids in.

Halle Brothers Co., Cleveland, store addition, 2500 tons.

Ohio University, Athens, Ohio, 200 tons.

General Baking Co., Boston, garage at Charlestown, 140 tons.

NON-FERROUS METALS

The Week's Prices

	Copper, New York		Straits Tin	Lead		Zinc	
Sept.	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
20.....	14.12½	13.75	32.25	6.25	5.90	7.10	6.75
21.....	14.12½	13.75	32.57½	6.30	6.00	7.10	6.75
22.....	14.12½	13.75	32.50	6.35	6.05	7.15	6.80
23.....	14.25	13.75	....	6.35	6.10	7.20	6.85
25.....	14.25	13.75	32.55	6.50	6.25	7.20	6.85
26.....	14.25	13.75	32.50	6.50	6.25	7.22½	6.87½

*Refinery quotation.

New York

NEW YORK, Sept. 26.

Demand in practically all of the markets is moderate but the price tendency in two of them is very strong. Quotations on all the metals, except copper, are higher than a week ago. Demand for electrolytic copper is better at unchanged prices. Transactions in tin are only moderate at slightly advanced quotations. Prices of both lead and zinc have again advanced to considerably higher levels, due largely to lack of ready supplies.

Copper.—Domestic demand for electrolytic copper is reported as having improved considerably in the last week, due largely to the better industrial conditions throughout the country. While prices have not changed, the minimum is, if anything, firmer than a week ago, with one or two producers sold up at present prices. Electrolytic copper for delivery this year is quoted at 14c., delivered, or 13.75c., refinery. While no advance in prices has as yet occurred, sentiment in the trade is rather confident that higher values will be realized in the near future. Lake copper is slightly stronger at 14.25c. to 14.50c., delivered.

Tin.—Moderate activity in the Straits tin market on Sept. 19, referred to in this paragraph a week ago, represented sales of about 300 tons for nearby delivery. On the following day, Sept. 20, the market was fairly active when about 300 tons changed hands at an average of 32.25c. On the following day, Sept. 21, the market was considerably quieter, but a small business was done on a scale from 32.62½c. down to 32.50c. Since that day the market has been exceedingly dull and prices have been largely nominal. September as a whole is regarded as an exceedingly good month in business transacted, with consumers almost entirely the buyers. Another favorable indication is that the metal purchased was mostly for nearby delivery, which would indicate that consumers were not as well covered as had been calculated, most of the metal going directly into consumption. Extreme dullness of the market in the last few days is due partly to the advance in London, which has caused a halt here. Should the market break there, more buying is expected to at once manifest itself here. Spot Straits tin was quoted to-day in a quiet market at 32.50c., New York. London quotations were about £3 per ton higher than a week ago at £161 5s. for spot Standard, £162 10s. for future Standard and £161 12s. 6d. for spot Straits. Arrivals thus far this month have been 3455 tons with 8078 tons reported afloat. It was not possible to confirm a Boston rumor published in a New York paper to the effect that domestic producers of electrolytic tin would cease operations on the expiration of present contracts for Bolivian ore because no duty had been obtained and also because a better price for Bolivian ore could be secured from European refiners.

Lead.—Because of limited supplies this market is exceedingly strong and quotations have continued to advance. The outside market at New York has advanced 25 points in the week until to-day quotations are 6.25c., St. Louis, or 6.50c., New York, at which business has been done. Small lots of 15 tons each have sold as high as 6.75c., New York, for spot delivery, but metal for this position is very hard to locate. On Sept. 22 the leading interest again advanced its quotation to 6.05c., St. Louis, or 6.25c., New York. The market is preeminently a sellers' market with the danger that consumers may advance quotations upon themselves to 7c., New York. Most producers are sold up for October and some well sold into November.

Zinc.—Scarcity of early delivery prime Western zinc, coupled with a disinclination on the part of producers to sell any more than necessary, has caused prices to advance to 6.87½c., St. Louis, or 7.22½c., New York, for early delivery. There has been a fairly insistent demand from consumers but it is believed that the situation to-day is a little easier in this respect, and it is possible that the advance has either reached its height or temporarily halted. The statistics, made public about a week ago, showed a substantial reduction in stocks; a corresponding lack of increasing production has also been a factor.

Antimony.—Wholesale lots of Chinese metal for early delivery are quoted at 6.75c. per lb., New York, duty paid.

Aluminum.—There has been no change in the price of the leading interest which continues at 19.10c., f.o.b. shipping point, for virgin metal, 98 to 99 per cent pure. The same grade of metal, imported from foreign producers, is quoted nominal at 18.25c. to 19c. per lb., New York, duty paid. Thus far the new duty on aluminum has had no pronounced effect upon quotations.

Old Metals.—Prices generally are unchanged except lead, which is higher. Business in red and yellow metals is quiet. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	13.50
Copper, heavy and wire	12.75
Copper, light and bottoms	11.25
Heavy machine composition	10.50
Brass, heavy	8.25
Brass, light	6.50
No. 1 red brass or composition turnings	9.00
No. 1 yellow rod brass turnings	7.50
Lead, heavy	5.50
Lead, tea	4.50
Zinc	4.00

Chicago

SEPT. 26.—Copper, lead and zinc have advanced. While there has been some buying, it has hardly been of sufficient volume to account for the advances; in fact, lead and zinc are believed to be headed for a reaction. The old metals remain unchanged except for an advance in copper bottoms. We quote, in carload lots, lake copper, 14.50c.; tin, 33.50c. to 34c.; lead, 6.37½c.; spelter, 6.90c.; antimony, 8.50c., in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 11c.; copper bottoms, 9.50c.; red brass, 8.75c.; yellow brass, 6.75c.; lead pipe, 4.50c.; zinc, 3.75c.; pewter, No. 1, 20c.; tin foil, 22.50c.; block tin, 26c., all buying prices for less than carload lots.

Scrap Active at Detroit

DETROIT, Sept. 25.—The market has been very active and melters are interested in the offering by one of the largest local producers of approximately 3000 gross tons of turnings, borings, flashings and hydraulic compressed for October delivery. The award will be made the last of the month on a competitive basis and in all probability the peak of the market for the year on these materials will be established. Some advances were recorded during the week, several sales on automobile cast reaching the high point for the year at $26. Hydraulic compressed and shoveling steel registered advances of 50c. per ton. The following prices are on a gross ton basis f.o.b. cars producer's yards, excepting stove plate, automobile and No. 1 machinery cast, which are quoted on a net ton basis:

Heavy melting steel	$15.50 to $16.00
Shoveling steel	15.25 to 16.25
No. 1 machinery cast	22.50 to 24.00
Cast borings	12.00 to 13.00
Automobile cast scrap	25.00 to 26.00
Stove plate	14.50 to 16.00
Hydraulic compressed	15.00 to 16.00

PERSONAL

Timothy Burns, who has been appointed general manager of the Lackawanna plant of the Bethlehem Steel Co., has had an experience of over 20 years in steel works operation. Born in Lawrence, Kan., in 1877, his preparatory school work was taken at Yankton College, S. D. He graduated from Lehigh University, Bethlehem, in mechanical engineering in 1901, working in the summers of 1899-1901 on the Government Survey in the Bad Lands of South Dakota. His first employment in steel was in the bar mills of the Cambria Steel Co. at Johnstown in 1901 to 1908. In the latter year he went to the Carnegie Steel Co.'s Duquesne plant and was employed in the bar mills. In 1912 he connected with the Pittsburgh Crucible Steel Co. as general superintendent, having charge of the building of merchant mills. He was active also in the development of alloy steels. On Jan. 1, 1917, he entered the employ of the Bethlehem Steel Co., being engaged on general construction of furnaces and mills at the Sparrows Point plant. He was transferred in the following September to Bethlehem, becoming general superintendent of the Saucon plant. His appointment as general manager of the Lackawanna plant at South Buffalo, N. Y., became effective last week.

TIMOTHY BURNS

James A. Farrell, president United States Steel Corporation, sailed for Europe on the Olympic on Sept. 23. He will be absent about six weeks, sailing from the other side on Oct. 28.

Dr. Federico Giolitti, Turin, Italy, was guest of honor at a luncheon at the Bankers' Club, New York, on Tuesday, Sept. 26, given by members of the Iron and Steel Committee of the American Institute of Mining and Metallurgical Engineers. Doctor Giolitti, who is re-visiting the United States, was managing director in the years of the war of the famous Ansaldo works. He is a son of the Italian prime minister. His visit to this country is expected to result in furtherance of plans for international co-operation between engineering organizations.

William Breeden, sales manager Lackawanna Steel Co., Buffalo, for the past three years, has resigned in connection with the reorganization of the sales force resulting from the taking over of the company by the Bethlehem Steel Co. Mr. Breeden went to Buffalo from Philadelphia and had been connected with the sales department for 11 years.

H. H. Colbus, formerly sales representative of the Halcomb Steel Co., Philadelphia branch, will represent the Down Tool Works, Inc., Fleetwood, Pa., in Philadelphia territory to handle high speed tools and drills.

Pell W. Foster, Jr., has been appointed New England district manager of the Power Specialty Co., 111 Broadway, New York, with offices at 50 Congress Street, Boston. He was formerly in the New York sales office.

Frank Osler, who for the past year has been supervising management and construction engineer of the Rose Polytechnic Institute, Terre Haute, Ind., and previously had been connected with the metal working industry as works manager, became associated with O. C. Herdrich & Co. on Sept. 15, as consulting industrial management engineer.

John H. Smith, for the past five years superintendent of works, Nova Scotia Steel & Coal Co., Ltd., Trenton Works, Nova Scotia, Canada, has been appointed general superintendent, Trenton Works Nova Scotia Steel & Coal Co., Ltd., and Eastern Car Co., Ltd.

Jacob E. Mesta has resigned as superintendent of machine shops, Mesta Machine Co., Pittsburgh, to go into the mill supply business for himself in Cleveland.

W. D. Creider has been appointed manager of the Milwaukee branch store of the Federal Machinery Sales Co., Chicago, succeeding J. C. Whitney, resigned. Mr. Creider was manager of the Chicago store and sales office of the Reed-Prentice Co., the Whitcomb-Blaisdell Machine Tool Co., and the Becker Milling Machine Co., until those companies discontinued direct selling.

Theodore G. Remsen, formerly sales representative of Hill, Clarke & Co., Chicago, has joined the sales force of the Federal Machinery Sales Co., Chicago.

S. Glen Vinson, vice-president and general manager of the Ideal Electric & Mfg. Co., Mansfield, Ohio, has returned from an extensive trip through the Orient, where he made a careful survey of business conditions. He visited the prominent cities of Japan, Hawaiian Islands, China and India, and returned by way of the Suez Canal, visiting Egypt, Italy, Switzerland, France and England.

A. E. Quere, formerly vice-president and general manager of the Niles Steel Products Co., Niles, Ohio, and previously in the sales department of the Brier Hill Steel Co., has been appointed assistant general manager of sales of the Ashtabula Steel Co., Ashtabula, Ohio.

Joseph S. Ruble, formerly vice-president of the Austin Co., Cleveland, has been elected director and vice-president of the H. K. Ferguson Co., same city, building engineer and contractor. He will have charge of construction work.

William E. Matthews of Cleveland was elected president at the annual meeting last week of the Carroll Foundry & Machine Co., Bucyrus, Ohio. W. D. Jones, Galion, Ohio, was elected vice-president and F. B. Squire, Cleveland, secretary and treasurer.

A. E. Hughes, for eight years identified with the operating department of the Brier Hill Steel Co., Youngstown, Ohio, has resigned, effective Sept. 25, to become general superintendent of the Ashtabula Steel Co., producer of black and galvanized sheets, operating eight mills at Ashtabula, Ohio. Mr. Hughes was formerly superintendent of the Brier Hill company's Western Reserve sheet mill plant at Warren, but has lately been located at its Thomas works in Niles.

William Dette of Crocker Brothers, New York, returned from a trip of several months in Europe on the Mauretania, Sept. 23.

John H. Gray of the United States Steel Corporation, 71 Broadway, New York, returned this week from a month's stay in Europe.

R. H. Scott has been elected president of the Atlas Drop Forge Co., Lansing, Mich., filling the vacancy caused by the death of S. H. Carpenter. Mr. Scott is vice-president and general manager of the Reo Motor Car Co. O. C. Hartig has been added to the Atlas directorate.

E. M. Kuhns was elected secretary of the National Cash Register Co., Dayton, Ohio, at a meeting of the board of directors held recently. He will also act as general counsel of the company.

Frederick N. Holmes, vice president and general manager North & Judd Mfg. Co., New Britain, Conn., saddlery and buckles, has been elected president of that corporation to succeed his father-in-law, the late Howard C. Noble.

A. W. Lines, formerly sales manager of the Spencer Smith Machine Co., Howell, Mich., has become affiliated with the Muskegon Motor Castings Co., Muskegon, Mich., to direct the manufacture and sales of gray iron pistons.

V. W. Collins, auditor of the Buffalo branch, Rome Wire Works, has been appointed supervisor over costs in charge of the Buffalo, Rome and Diamond branches of the plant with headquarters in Rome, N. Y.

J. E. McAdams, president Steel Products Engineering Co., Springfield, Ohio, returned last week to his home at Dayton from an extended foreign trip. He visited England, France, Italy, Switzerland, Holland, Germany and Belgium.

OBITUARY

H. H. Campbell—An Appreciation

As recorded briefly in THE IRON AGE of Sept. 21, Harry Huse Campbell, formerly general manager of the Pennsylvania Steel Co. at Steelton, Pa., died on Sept. 17, 1922, at the Cathcart Home, Devon, Pa., aged 63 years. He was born at West Roxbury, Mass., where he attended the common schools, afterward taking the course in mining engineering, which included metallurgy, at the Massachusetts Institute of Technology, where he was graduated in 1879 with the degree of S. B. For over 25 years he was secretary of his class. Immediately after graduation he secured a position with the Pennsylvania Steel Co., under the late Major Bent, and remained with that company until his health failed in 1906. He started as a learner and rose step by step to have charge of the whole works.

He was active in the American Institute of Mining Engineers, of which he was a manager from 1893 to 1895, and in the American Society for Testing Materials, and made important contributions to their transactions. His book on "Manufacture and Properties of Iron and Steel," which ran through four editions, is even now one of the standard works on steel, and it is frequently quoted by writers on the subject.

Mr. Campbell did much for steel metallurgy. He was the first to work out the chain of phenomena in the open-hearth steel process, his first publication thereof being a monumental paper at the meeting of the American Institute of Mining Engineers at the World's Fair at Chicago, in 1893. His work comprised: (1) The scheme of combustion beginning with the gas producer; (2) the heat balance starting with the heat value of the fuel and oxidized ingredients of the charge and tracing its course through the various ways in which it was spent; (3) the chemistry of the operation, and (4) the metallurgical features. All these were dealt with more fully in his book which treated also of the other branches of iron metallurgy, including the blast furnace, Bessemer process, etc., and included statistics of production in the iron producing countries of the world.

Mr. Campbell was the inventor of several improvements relating to the production of steel, the most important of which was the tilting open-hearth furnace. The first design was circular in cross-section and could be rolled bottom up, if need be, as for patching an eroded roof with silica sand. His later tilting furnaces, however, were nearer the usual design as to hearth, the central tilting section of the furnace being mounted on rollers which rested on two or more tracks which were segments of circles set in vertical planes. The power to tilt was applied either by hydraulic cylinders or later by electric motors.

His illness, which prevented walking, did not affect his mind, as shown by some fine articles he contributed to THE IRON AGE relating to iron and steel in Europe during the early stages of the World War.

He was unusually strong physically, and had a good constitution, which enabled him to live long after the usual period for one so afflicted. He was devoted to his work, but in spite of his forced withdrawal from it and his malady he maintained his cheerfulness to the end in an inspiring though pathetic way. Mr. Campbell never married. He leaves behind him two sisters and a brother.

HENRY D. HIBBARD.

M. L. BAILEY, treasurer of the Union Mfg. Co., New Britain, Conn., died at his home in that city on Tuesday morning, Sept. 26. Mr. Bailey was born in New Britain in 1856 and became associated with the Union Mfg. Co. in 1877. He was elected secretary seven years later, a member of the directorate in 1887 and treasurer in 1888, holding the last two offices at the time of his death. Mr. Bailey was an active figure in machinery and tool circles.

NO SURPLUS CARS

Demand Equals Supply for First Time Since November, 1920

WASHINGTON, Sept. 26.—Production of soft coal during the week of Sept. 18-23, according to the Geological Survey, is estimated at from 9,600,000 to 9,900,000 tons, a slight increase over the preceding week. A total output of anthracite coal for the week was estimated at 1,850,000 tons. Loadings of soft coal on Monday, Sept. 18, were 37,330 cars, the highest since the close of the strike, but they dropped sharply to 29,496 cars on Tuesday. On Friday they were 27,396 cars. The present output of soft coal is above that of the corresponding period of the year of depression, 1921, but is below that of the three years 1918 to 1920, the production in the second week of September of these three years having been 12,542,000, 11,046,000 and 10,685,000 tons, respectively.

A further increase has marked dumpings of lake coal during the week of Sept. 18-23. It is indicated that lake coal is now going forward at a rate close to the maximum of any time in the past. The total cargo coal dumped from the beginning of the season to Sept. 17 was in round numbers 7,000,000 tons. This was 10,100,000 tons behind 1921 and even 6,170,000 tons behind 1920, when priority was given to coal shipped to the Lakes.

For the first time since November, 1920, the number of surplus freight cars has been virtually absorbed by the growing demand for transportation facilities due to increased industrial activity, according to reports just received by the Car Service Division of the American Railway Association from the railroads of the country. Such a situation at this time is seasonable and normal, however, for there is always a heavier demand for freight cars in the fall than at other times, owing to the increase in the movement of crops and fuel, as well as all other commodities.

On Sept. 8 there were 43,168 surplus freight cars, 27,287 fewer than on Aug. 31. At the same time there were requests from shippers for 67,899 cars, which could not be complied with just at that time. This was 9,229 cars more than on Aug. 31.

Surplus coal cars numbered 34,685 on Sept. 8, a reduction of 19,881 since Aug. 31, while unfilled orders for cars on that date totaled 18,554 cars. Surplus box cars totaled 2187 cars, a reduction of 1703 in the same period, while unfilled orders for cars on Sept. 8 totaled 39,032 cars.

While the accumulation of surplus freight cars began in November, 1920, the peak was not reached until April 8, 1921, when there were 507,427 cars. Since then there has been a steady decrease which has been more pronounced since April this year when loading of revenue freight began to increase.

Increasing Production in Connellsville Region

UNIONTOWN, PA., Sept. 25.—Flare of coke ovens throughout the Connellsville bituminous region and moving coal trains tell the story of industrial resumption here in unmistakable terms. It is proof that the unionization of the Connellsville region again has failed, although union leaders are making a vigorous fight to strengthen their position.

Appeals have been issued broadcast for financial assistance. It is admitted in these appeals that the union is fighting with backs to the wall.

No gains have been made by the union in affiliating small operations while the H. C. Frick Coke Co. and independent operations in the region are pushing forward their production at a rapidly increasing rate. Reports for the week ending Sept. 16 show that the production for that week reached 97,750 tons, the highest since the strike developed. The Frick company is operating now at 60 per cent normal.

Eviction notices have been issued against employees at the Oliver Snyder Steel Co. at its three Oliver plants near Uniontown. To date, the company had maintained a watchful waiting policy with no effort to resume operations or to dispossess striking employees.

Machinery Markets and News of the Works

RAILROAD BUYING GROWS

Most of the Activity in Machine Tools and Cranes from This Source

Further Price Advances on Some Lines and General Rise Is Predicted

Railroad business continues as the principal activity in nearly all machine-tool markets, and inquiries for cranes and other heavy equipment from the railroads also are growing in number and importance. Those companies which specialize in railroad shop equipment have thus far in September had the best month of the year, while other machine-tool builders who have not shared in the railroad business to any extent report little, if any, improvement over the past month or two. Outside of railroad buying the volume of machine-tool buying this month has been below expectations.

The Illinois Central has within the past week placed orders for $70,000 worth of additional equipment, making about $600,000 that this road has expended within the past few months. The Rock Island continues to place orders, which now total in value about $60,000. The Chicago, Milwaukee & St. Paul has bought several tools and numerous other roads have placed orders for one or two machines. The Chicago, Burlington & Quincy is expected to buy at any time. The Missouri-Kansas-Texas Railroad, which inquired recently for 116 items for shops at Bellmead, Texas, has bought four milling machines and a crane and will probably place additional orders within a few weeks. The Long Island Railroad has now bought a total of eight or ten tools. In Canada the Canadian National Railways is inquiring for about 50 items.

An important probable source of buying is for locomotive repair work, for which many private plants are being engaged. The Crucible Steel Co. of America will utilize its ordnance plant at Harrison, N. J., for this purpose. A company at Cincinnati will require 20 heavy-duty machines for locomotive repair work and another company at Cincinnati, to engage in the same work, will probably come into the market shortly with a substantial list.

The reopening of the Ford plants, after a brief shutdown, has lifted the feeling of depression in some quarters caused by the shutdown less than two weeks ago. The Maxwell Motor Co., Detroit, has bought 12 special machines. The Continental Motors Co., Muskegon, Mich., continues to buy.

There is considerable inquiry in the hydroelectric field, which seems to have embarked upon a large era of expansion. Oil companies also are fairly good buyers. The Gulf Refining Co. has placed orders for five lathes and two radial drills. The Imperial Oil Co., Toronto, Ont., has issued a general machine-tool list.

While there have been some advances in machine-tool prices, it is expected that the general rise, which has been forecast for some weeks, will take place within the next 30 days. Recent changes in price include an advance of 10 per cent on lathes and drilling machines by a Cincinnati company and an advance of 5 to 7½ per cent by a Cleveland builder of automatic screw machinery.

There is active buying of cranes in the Central States, particularly by steel companies and railroads. The pending inquiry of the Pennsylvania Railroad for 17 cranes is an example of current activity in the crane market.

New York

NEW YORK, Sept. 26.

MACHINE-TOOL companies which specialize in railroad tools have had so far this month the best business of the year. Some of the dealers in general lines of machine tools have also enjoyed a good September trade, but representatives of individual manufacturers have not been so fortunate, particularly those making the lighter types of tools. Railroad buying in the East has not assumed the proportions reached in other sections, Chicago in particular, but the Eastern roads are buying a machine or two at a time and it is the belief of sellers that such business will show gradual expansion. The Long Island Railroad has purchased several tools in addition to the four mentioned last week. The New York Central is buying a tool occasionally and has sent out an inquiry for a hydraulic bushing press. Recent inquiries of the New York Central for 40 to 50 machines are still largely dormant. The Delaware & Hudson has bought a 500-ton wheel press. An Eastern company has received an order from the Union Pacific for a 6-ft. radial drill. The utilization of the ordnance plant of the Crucible Steel Co. of America at Harrison, N. J., for locomotive repair work will presumably mean a call for additional shop equipment. On the whole September business has been disappointing to many sellers, who hoped that the virtual ending of the railroad strike would bring about quick action on the inquiries which have accumulated in their files in recent months.

No new inquiries for cranes of any size are reported and but few sales have been made in this district during the week. The list of cranes for the Pennsylvania Railroad, Eastern Region, Philadelphia, has again been revised and bids taken on the 250-ton overhead cranes that appeared in the original inquiry. Bids were not received after Sept. 25. The Brooklyn Edison Co. has inquired for two 150-ton, 98-ft. span, 4-motor overhead traveling cranes, with 15-ton auxiliaries. The 90-ton overhead traveling crane recently inquired for by Suzuki & Co. for export to Japan is reported to have been placed with a Japanese builder.

Among recent purchases are:

Chemung Iron & Steel Co., Elmira, N. Y., a 10-ton, 25-ft. span, 1-motor overhead traveling crane from the Reading Chain & Block Corporation.

West Penn Power Co., Pittsburgh, two grab bucket trolleys for handling 3-cu. yd. buckets from the Milwaukee Electric Crane & Mfg. Co. Blaw-Knox buckets were purchased.

Maine Central Railroad Co., Portland, Me., a 150-ton wrecking crane from the Industrial Works.

Center Foundry Co., Wheeling, W. Va., a 10-ton, 45-ft. 6-in. span, 3-motor, overhead traveling crane and a No. 84 and No. 66 Newton cupola crane, from the Northern Engineering Works.

George W. Smith & Co., Philadelphia, a 5-ton, 72-ft. span overhead traveling crane from the Shepard Electric Crane & Hoist Co.

Viscose Co., Marcus Hook, Pa., a 5-ton, 43-ft. span over-

head traveling crane from the Shepard Electric Crane & Hoist Co.

Interborough Rapid Transit Co., New York, a 4-ton, cage-control monorail hoist from the Shepard Electric Crane & Hoist Co.

Central Iron & Steel Co., Harrisburg, Pa., six 2-ton electric hoists from the Shepard Electric Crane & Hoist Co.

T. S. Van Kirk Co., Paterson, N. J., a 3-ton, cage-control monorail hoist from the Shepard Electric Crane & Hoist Co.

Alfred Box & Co., Philadelphia, report the sale of the following cranes in the past four weeks: Patterson Foundry & Machine Co., East Liverpool, Ohio, a 5-ton electric jib crane; Fairmont Water Works, Fairmont, W. Va., a 1-ton, 15-ft. span electric crane; Logan Foundry & Machine Co., Logan, Ohio., a 10-ton, 38-ft. span hand power crane; Philadelphia Rapid Transit Co., Philadelphia, two 12-ton, 38-ft. span electric cranes; Proctor & Schwartz, Philadelphia, a 2-ton, 16-ft. span transfer crane; Lehigh Valley Railroad Co., New York, a 5-ton electric jib crane; E. Hoe & Co., New York, two 3-ton, 22-ft. span electric traveling cranes; Armstrong Cork Co., Lancaster, Pa., a 10-ton, 36-ft. span, 3-motor mill type crane and two 3-ton, 24-ft. span, 3-motor mill type cranes; J. G. White Engineering Corporation, New York, a 10-ton, 17-ft. span hand power crane for Pennsylvania Electric Co. This company also booked orders for seven 1-ton and 2-ton electric hoists for companies in New York, Michigan, Ohio, Texas and Pennsylvania.

The Department of Plants and Structures, Municipal Building, New York, has awarded a contract to the Contractors Service Corporation, 226 Jackson Street, Brooklyn, for the erection of a new four-story machine shop at Sixteenth Street and Avenue C. Grover A. Whalen is commissioner.

The Stevens & Thompson Paper Co., 45 West Eighteenth Street, New York, has arranged for a bond issue of $1,000,000, a portion of the proceeds to be used for extensions to its mills at Walloomsac and Greenwich, N. Y., and for the acquisition of a subsidiary company at Bloomfield, N. J. It is proposed to increase the plant capacity from 85 to 100 tons per day. Frank L. Stevens is president.

The Berg Auto Trunk & Specialty Co., 400 Lafayette Street, New York, manufacturer of metal and metal-reinforced product, has leased space in the Chicle Building, Thompson Avenue, Long Island City, for a branch plant.

A vocational department will be installed in the new high school to be erected at Arverne, L. I., estimated to cost $1,250,000. C. B. J. Snyder, Concord Street, Brooklyn, is architect and engineer.

The Crane Co., 77-81 Broadway, Troy, N. Y., manufacturer of valves, steam specialties, etc., with headquarters at 836 South Michigan Avenue, Chicago, has awarded a contract to the Metzgar Construction Co., 676 Genesee Street, Troy, for the erection of a new one-story factory branch, 200 x 280 ft., on Church Street, near Third Street. Frederick W. Zander is local manager.

Power equipment, hoisting and conveying machinery, and other kindred mechanical equipment will be installed in the nine-story storage building, 75 x 200 ft., to be erected at 370-90 Gates Avenue, Brooklyn, by Edward F. Jenkins, care of the Commonwealth Engineering Co., 103 Park Avenue, New York, contractor.

The Motive Parts Corporation, 136 West Fifty-fifth Street, New York, has leased property at 796 Tenth Avenue, for a branch works.

A vocational department will be installed in the new high school to be erected at Hicksville, N. Y., estimated to cost about $200,000. Coffin & Coffin, 522 Fifth Avenue, New York, are architects and engineers.

The General Electric Co., Schenectady, N. Y., has awarded a contract to the Austin Co., Bulletin Building, Philadelphia, for the erection of a new one-story plant building, 100 x 340 ft., estimated to cost about $125,000. The company has also awarded a contract to the Foundation Co., 120 Liberty Street, New York, for the construction of its proposed one-story branch plant, 100 x 300 ft., at Oakland, Cal., to cost about $100,000, and on which work will be commenced at once.

The Traymore Garage Corporation, New York, has acquired property at 36-42 Jumel Place, near Edgecombe Road, 100 x 100 ft., for the erection of a new two-story automobile service and machine repair works to occupy the entire site.

The Brooklyn Motor Service, Inc., Brooklyn, has leased property at Sixth Street and Third Avenue, a one-story building with about 12,000 sq. ft. of floor space, for a service and general machine repair plant.

The Diamond Match Co., 111 Broadway, New York, is arranging for a stock issue of $7,000,000, a portion of the proceeds to be used for plant extensions and improvements.

The Department of Public Works, Capitol Building, Albany, N. Y., has completed plans for the construction of a new hydroelectric power plant at Visscher's Ferry, N. Y. Charles L. Cadle is superintendent.

The Reid Ice Cream Co., 79 West 132d Street, New York, has acquired property on West 141st Street, near Fifth Avenue, and will use a portion of the site for the erection of an automobile service and repair building for company cars and trucks.

A vocational department will be installed in the two-story high school, 60 x 100 ft., to be constructed at Pine Bush, N. Y., by the Board of Education, Wallkill, N. Y.

The Detroit-Cadillac Motor Car Co., 1881 Broadway, New York, has tentative plans under consideration for the erection of a new service and repair building on site recently acquired on Columbus Avenue, between Sixty-second and Sixty-third Streets.

B. Landau, 516-18 West Forty-eighth Street, New York, operating an automobile service and general machine repair works, has filed plans for the erection of an additional story on the present two-story building.

John J. Townsend, referee in bankruptcy for the Aborn Steel Co., 22-24 Clarke Street, New York, is arranging for the sale of the property of the company, including cranes and other equipment at the location noted to W. E. Steinback, who has made an offer for the assets.

The Westchester Lighting Co., First Avenue and First Street, Mount Vernon, N. Y., has awarded a contract to the H. Wales Lines Co., Meriden, Conn., for a one-story automobile service and repair works at Mount Kisco, N. Y., estimated to cost $50,000.

Frank B. Lasette, 246 West Sixteenth Street, New York, heating and plumbing equipment, has acquired a factory building on Prospect Street, near the Bridge Plaza Station, Long Island City, to be equipped for the most part as a general metal-working shop.

The State Motors Co., Main Street, Mechanicsburg, N. Y., local agent for the Chevrolet automobile, now occupying temporary quarters, is considering the erection of a new service and repair works.

The L. M. Ward Co., 38 Bloomfield Avenue, Passaic, N. J., automobile dealer, has awarded a contract to J. J. O'Leary, 129 Prospect Street, for the erection of a one-story service and repair building at Main Avenue and Monroe Street, Clifton, N. J., to cost about $100,000. W. C. Pattison, Lawyers' Building, Main Street, Passaic, is architect.

Samuel A. Lerner, Lerner Building, Boulevard, Jersey City, N. J., is having plans prepared for a six-story automobile building, 100 x 200 ft., with complete repair, parts and service departments, at the Boulevard and Communipaw Avenue, estimated to cost close to $500,000. William Neumann, 999 Bergen Avenue, is architect.

The Shaw Insulator Co., 5 Kirk Place, Newark, N. J., manufacturer of electric insulators, has removed its plant to a new building at 148 Coit Street, Irvington district, where larger space is available for additional equipment.

The Ford Motor Co., Lincoln Highway, Kearny, Newark, N. J., will build a new one-story power house, 53 x 160 ft., at its local assembling plant. A gasoline storage building will also be erected. The expansion will cost in excess of $180,000.

Buffalo

BUFFALO, Sept. 25.

The Harrison Radiator Co., Washburn Street, Lockport, N. Y., manufacturer of automobile radiators, has plans in preparation for the erection of a three-story addition, 150 x 300 ft., at Washburn and South Streets. James R. Tyler, 715 Union Trust Building, Rochester, N. Y., is architect.

The Buffalo Bronze Die-Casting Co., 90 Arthur Street, Buffalo, is planning for the erection of a plant addition.

The United States Hoffman Machinery Co., 329 Temple Street, Syracuse, N. Y., manufacturer of clothes-pressing machines, irons, parts, etc., is planning for the erection of an addition. Capacity will be increased about 20 per cent.

A vocational department will be installed in the two-story and basement high school, 140 x 166 ft., to be erected at Eastwood, near Syracuse, N. Y., estimated to cost about $175,000.

The Bronze Hardware Mfg. Corporation, Buffalo, manufacturer of automobile hardware, has leased the two-story buildings at 106-8 College Street, 50 x 100 ft. and 25 x 120 ft., for the establishment of a new plant. W. H. Barlow is president.

The King Electric Mfg. Co., 20 North Niagara Street, Tonawanda, N. Y., manufacturer of battery equipment and other electrical apparatus, is planning for the installation of new machinery.

The Lockport Foundries Corporation, Lockport, N. Y., is

perfecting plans for the erection of a new one-story machine shop. Robert E. Bryant is treasurer.

A vocational department will be installed in the two-story and basement high school, 200 x 300 ft., to be erected at Cascade and Twenty-third Streets, Erie, Pa., estimated to cost about $450,000, for which a general contract has been awarded to H. J. Conrath, Ariel Building.

The Eastman Kodak Co., Rochester, N. Y., is perfecting plans for the erection of a new factory building at its plant at Kodak Park.

A vocational department will be installed in the two-story high school to be erected at Avoca, N. Y., 330 x 380 ft., estimated to cost about $300,000.

The Board of Education, Orchard Park, N. Y., is arranging a list of equipment to be installed in the vocational department at its proposed new high school.

The Keystone Tool and Metal Parts Corporation, 65 Oak Street, Buffalo, will erect a one-story addition, 34 x 75 ft.

Chicago

CHICAGO, Sept. 25.

RAILROAD buying still holds the center of the stage. The Illinois Central has placed orders duplicating some of the machines on its previous purchase. These additional machines represent an aggregate outlay of about $70,000 and the road's total purchases up to date are estimated at over $500,000. The Rock Island continues to place orders against its old list and has probably closed for $50,000 worth of machines thus far with the likelihood that the total will run up to $100,000 before buying is completed. The company is limiting its purchases to machines which are imperatively needed. The Chicago, Milwaukee & St. Paul has placed orders for a 44-in. boring mill, a 28-in. shaper, a 36-in. heavy duty sliding head drill, a 36-in. engine lathe and a 1500-lb. steam hammer. The Chicago, Burlington & Quincy is expected to place orders against its lists at any time.

Automotive interests continue to do some buying. The Nash Motor Co., Kenosha, Wis., has bought two "Simplimatic" turret lathes from the Gisholt Machine Co. and the Maxwell Motor Co., Detroit, has placed an order for 12 of the same machines. The Continental Motors Co., Muskegon, Mich., continues to place a few machines from time to time. Orders and inquiries for tools from general sources continue to improve slowly, but steadily.

Few additional price changes are reported. The Millholland Machine Co., Indianapolis, has advanced turret lathes approximately 10 per cent, effective Oct. 1.

The Erie has placed an order with the Morgan Engineering Co. for a 250-ton gap crane for the railroad's Hornell, N. Y., shops. The crane is designed to pull a locomotive up between the girders, in reality being two 125-ton cranes which may be used separately or in unison. The Atchison, Topeka & Santa Fe has ordered a 150-ton overhead electric traveling crane from the same builder for its Albuquerque, N. M., shops. The Pullman Co. is about to close for a number of cranes for its new car-wheel foundry at Pullman, Ill. Included in this equipment are two 10-ton 100-ft. span electric traveling cranes, two 2-ton crane bridges on which Shepard hoists have been specified, and three pitting cranes. The Pullman Co. has already placed 11 two-motor 3-ton hoists for its wheel foundry at Pullman and 10 five-ton hoists for its Michigan City works with the Shepard Electric Crane & Hoist Co. The same builder recently booked the following orders:

Six 3-ton hoists for the Ryan Car Co., Hegewisch, Ind.

Two 3-ton hoists for the Chicago, Milwaukee & St. Paul R. R.

Four 2-ton hoists for the Jeffery Mfg. Co., Columbus, Ohio.

One 2-ton single I-beam crane and hoist for the Motor Castings Co., South Bend, Ind.

Two 3-ton single I-beam cranes and hoists for the American Spiral Pipe Works, Chicago.

Four ½-ton hoists for the Allis-Chalmers Mfg. Co. at Cincinnati.

A 2-ton two-motor hoist for the Bates Expanded Steel Truss Co., Chicago.

A 2-ton underslung-type crane with electric hoist for the Wisconsin River Paper & Pulp Co., Neenah, Wis.

The Elgin Stove & Oven Co., 14 Chicago Street, Elgin, Ill., will construct a three-story plant at State and Schiller Streets, to cost $100,000. Frank D. Chase, Inc., Chicago, has prepared plans and is receiving bids.

The Illinois Central Railroad is taking bids on a one-story roundhouse and shop improvements at Evansville, Ind., to cost $75,000.

The James T. Igoe Co., printer, 117 West Harrison Street, Chicago, has let a contract for a 10-story printing plant, 99 x 125 ft., 600-612 West Van Buren Street, to cost $300,000.

The International Harvester Co., 606 South Michigan Avenue, Chicago, will construct a five-story factory and pattern storage building, 59 x 124 ft., Blue Island and Oakley Avenues, to cost $90,000.

Fleck & Buchholz, automobile service, 19 West Railroad Street, Downers Grove, Ill., will construct a service station and garage, 70 x 157 ft., La Grange, Ill., to cost $50,000. Fugard & Knapp, 212 West Superior Street, Chicago, are receiving bids.

The Keith Furnace Co., DesMoines, Iowa, is completing a new foundry at Twenty-sixth Street and Dean Avenue, to cost $150,000.

The Des Plaines Foundry, Des Plaines, Ill., has bought two tumblers from the Whiting Corporation.

The Woodruff & Edwards Co., Elgin, Ill., has commenced the construction of a foundry addition, 80 x 94 ft., and a three-story warehouse, 50 x 94 ft.

O. W. Bowman, Virden, Ill., is completing a blacksmith and machine shop, 30 x 90 ft.

The Evan L. Reed Mfg. Co., manufacturer of display racks and store fixtures, steel supply racks, etc., is moving from Sterling, Ill., to the former Moore Motor Co. plant at Danville.

The Star Foundry, Oshkosh, Wis., was recently damaged by fire.

The C. & P. Mfg. Co., 630 South Wabash Avenue, Chicago, recently incorporated with $5,000 capital stock, will manufacture a patented dish-washing machine. At present it is undecided whether to build a plant or have the parts made and assembled. Officers are: C. T. Coates, St. Louis, president; W. G. Beasley, Chicago, vice-president, and M. P. Phillips, Chicago, secretary and treasurer.

The Garage Service Co. has commenced the construction of a three-story building, 70 x 130 ft., at 210-214 South Peoria Street, Chicago. The building will be used for storage, repairing, painting and renovating of automobile trucks, and will cost $300,000. The Simpson Construction Co., Chicago, is the general contractor.

The Commercial Auto Body Co., 2540 South Wabash Avenue, Chicago, has leased the three-story and basement factory at 3548-58 Shields Avenue, for the manufacture of truck and delivery bodies.

The Cabranette Corporation and the Belson Mfg. Co. have jointly leased the three-story building at 800 South Sibley Street, Chicago, which is 100 x 120 ft. The lessees already occupy the second and third floors in the manufacture of sheet metal specialties and "cabranettes."

The Irving Park Ice Co., 4226 North Springfield Avenue, Chicago, has started the construction of the first unit of an ice manufacturing plant at the northeast corner of Kedzie and Harmon Avenues. The first unit, a one-story structure with a daily capacity of 150 tons of ice, will cost $150,000.

I. D. White & Co., Inc., 113-115 North Des Plaines Street, Chicago, recently organized witth $15,000 capital stock, is an incorporation of a co-partnership of the same name. The company manufactures industrial sheet metal products. It occupies 5000 sq. ft. of floor space, but expects to move to larger quarters by next May. Officers are I. D. White, president and general manager; Arthur Miller, secretary and treasurer, and Harry Harvey, vice-president.

The Maquoketa Electric Power Co., Maquoketa, Iowa, is completing plans and will soon call for bids for the erection of a new one-story hydroelectric power plant, estimated to cost about $175,000. Holland, Ackerman & Holland, 53 West Jackson Boulevard, Chicago, are engineers.

A vocational department will be installed in the new two-story and basement senior and junior high school to be erected at Fifth Street and Thirteenth Avenue, Minneapolis, Minn., estimated to cost about $700,000. E. H. Eager, 245 Ninth Avenue, North, is architect.

Mechanical freight handling equipment, conveying machinery, trucks, etc., will be installed in the new two-story freight terminal, 30 x 450 ft., to be erected at Indianapolis, by the Illinois Central Railroad Co., 135 East Eleventh Place, Chicago, estimated to cost about $200,000.

The Council, Marshalltown, Iowa, has rejected all bids recently received for pumping machinery, electrical equipment and other mechanical apparatus for the proposed new municipal waterworks pumping plant, and will call for new

bids on revised plans at an early date. Burdick & Howson, 8 South Dearborn Street, Chicago, are engineers.

The McCarthy & Dowdle Auto Express Co., 332 Goodrich Avenue, St. Paul, Minn., will build a one-story automobile service and repair works, 66 x 105 ft., for company trucks and cars, on Smith Street, near Seventh Street. Mather & Fleischbein, 442 Endicott Building, are architects.

The Commonwealth Edison Co., 72 West Adams Street, Chicago, has revised plans in preparation for the erection of a one-story addition to its power house at Fifty-sixth and Lowe Streets.

A vocational department will be installed in the new two-story high school to be erected at Crystal Lake, Ill., 200 x 200 ft., estimated to cost about $200,000, for which new bids on revised plans will be asked at an early date. Joseph C. Llewelyn, 38 South Dearborn Street, Chicago, is architect.

The Board of Education, Hayward, Wis., has engaged E. F. Johnson, architect, Superior, Wis., to draw plans for a new high school, with a vocational training department, to cost not more than $150,000.

A vocational department will be installed in the new three-story and basement junior high school, 160 x 190 ft., to be erected at Cedar Rapids, Iowa, estimated to cost about $450,000, for which bids on a general contract will be received on Oct. 2. Herbert Rugh, 811 Security Building, is architect.

The Hewes Garage, 334 North Genesee Street, Waukegan, Ill., has plans nearing completion for the erection of a new two-story service and repair shop addition, 50 x 70 ft., estimated to cost about $45,000.

The Zenith Concrete Gravel Co., Earlton, Minn., has preliminary plans under consideration for the erection of a new one-story rock-crushing plant, estimated to cost about $50,000, including equipment. Herbert Kelly is general manager.

The Common Council, Hastings, Neb., will commence work at once on extensions and improvements in the municipal electric power plant, to cost about $25,000.

The International Harvester Co., 606 Michigan Avenue, Chicago, has filed plans for the erection of a new five-story plant addition, 59 x 124 ft., at Blue Island and Oakley Avenues, estimated to cost about $90,000. A portion of the structure will be equipped as a pattern shop for metal and wood pattern production.

A vocational department will be installed in the new three-story and basement high school to be erected at Bloomfield, Iowa, estimated to cost about $135,000, for which bids will be received on a general contract until Oct. 2. William Gordon, 317 Hubbell Building, Des Moines, Iowa, is architect.

The City Council, Stuart, Neb., will soon commence the construction of a municipal electric light and power plant. Plans have been completed.

Cincinnati

CINCINNATI, Sept. 25.

WHILE there was no great improvement evidenced in the machinery market during the past week, local manufacturers report that there was no decrease in the number of orders placed. The industry is holding its own very well, and with a complete settlement of the railroad strike greater activity is expected.

The only new inquiry of consequence to come before the trade during the past week was from a local manufacturer, who has taken a contract for locomotive repair work, and who will buy approximately 20 heavy duty machine tools. Another local manufacturer, who is also contemplating turning part of his plant into a railroad repair shop, is expected to come into the market within the next week or so with quite a substantial list.

The principal buying during the week came from the railroads. The Illinois Central bought a number of tools, in addition to those recently reported. The Long Island Railroad bought four machines from a Cincinnati manufacturer, and the Southern Railroad is about to close on seven tools. The Gulf Refining Co. bought five lathes and two radial drills. Scattered orders for one and two machines were reported by all manufacturers, and while the industry as a whole is not running anywhere near capacity, the number of orders being booked is entirely satisfactory in view of prevailing conditions.

Newport, Ky., is asking for bids on pumping equipment for the water works plant. Approximately $150,000 will be spent. Bids will be opened Nov. 14. Mayor Hermann is chairman of the City Commissioners.

The Vulcan Last Co., Portsmouth, Ohio, will rebuild its branch plant at Crandon, Wis., which was recently damaged by fire to the extent of $200,000. Work will be begun immediately.

The Superior Gas Engine Co., Springfield, Ohio, has completed plans for the erection of a three-story office building, to cost approximately $100,000.

Atzel Bros., Cincinnati, will build a public garage, which will include a service station and completely equipped repair shop, in the Madisonville section of the city. The building will be 75 x 150 ft., two stories high, of brick construction, and will cost, with equipment to be installed, approximately $50,000.

The Banner Die, Tool & Stamping Co., Columbus, Ohio, has moved to a new location at 529 North Park Street. The company manufactures dies, tools, gages, fixtures and special machinery.

The New Favorite Mfg. Co., formerly located in Columbus, has moved its plant to Troy, Ohio, and is now located on East Water Street. The company manufactures valve grinders, valve lifters and water motor washing machines.

The Crystal Laundry Co., Dayton, Ohio, will build an addition to its plant at 229 South Clinton St. The company will install about $10,000 worth of additional machinery.

The Trump Mfg. Co., Springfield, Ohio, has been authorized to increase its capital stock from $125,000 to $200,000. This step was taken, President John J. Hoppes states, to provide increased facilities needed for taking care of the large volume of business now offered to water wheel manufacturers, and for the purpose of reducing cost of operation. The company has been operating on a reduced schedule for some time, but has lately booked considerable business and immediate prospects are bright. Improved electric traveling cranes are to be installed in both the foundry and machine shop to facilitate the handling and assembling of material. The company also expects to install several new machine tools which will enable it to greatly increase its output.

Philadelphia

PHILADELPHIA, Sept. 25.

The Commercial Truck Service Corporation, Hunting Park and Rising Sun Avenue, Philadelphia, has awarded a contract to the William Steele & Sons Co., 1600 Arch Street, for the erection of a plant at Franklin and Vine Streets, to cost $370,000. A complete machine repair works will be installed.

Samuel W. Traylor, president of the Traylor Engineering Mfg. Co., Allentown, Pa., manufacturer of mining and smelting machinery, has awarded a contract to the William Steele & Sons Co., 1600 Arch Street, Philadelphia, for the erection of an eight-story plant, 124 x 205 ft., at Broad Street and Lehigh Avenue, Philadelphia, to cost about $455,000. It will be used as a direct factory branch.

The Supply Officer, Navy Department, Navy Yard, Philadelphia, will soon call for bids for 3500 ft. of steel tubing and 500 turnbuckles for the local aero service.

Robinson's Iron & Steel Co., Parker & Umbria Streets, Philadelphia, is planning for the purchase of a stiff-leg derrick, about 3-ton capacity, with 40 ft. boom. Roy A. Robinson is head.

The Kensington Hygeia Ice Co., Trenton Avenue and Huntingdon Street, Philadelphia, will build a one-story addition to its power house.

Ludwig Brothers, 3226 North Lee Street, Philadelphia, machinists, will install a number of new machine tools, including drill press, shaper, etc.

The Board of Freeholders, Trenton, N. J., is taking bids for the erection of a two-story automobile service and repair building on Brunswick Avenue, for county trucks and cars, estimated to cost about $40,000.

The Murray Rubber Co., Trenton, N. J., has been organized to take over and operate the plant of the Empire Tire & Rubber Co., North Clinton and Mulberry Streets, recently acquired at a public sale by W. W. Pepper, C. Eward Murray, Jr., and others. The new company will operate with a capital of $1,750,000 and 25,000 shares of common stock, no par value. Plans are under way for immediate plant expansion, to include the installation of additional equipment to balance the different lines of production. Mr. Murray will be president and general manager; Mr. Pepper, vice-president and treasurer; and Harvey R. Nason, secretary.

The Freeman Electric Co., Trenton, N. J., is perfecting plans for extensions in its plant, to include a new building on Prince Street, and the removal of the present works on East State Street to the new location. Equipment will be provided for the manufacture of switches, metal-jacketed

sockets, cutouts and kindred specialties. Edgar H. Freeman is head.

The Panelyte Board Co., Smith Building, 119-25 North Montgomery Street, Trenton, N. J., has acquired a tract of land on Railroad Avenue, totaling about 9½ acres, and will use a portion of the site for the erection of a new plant for the manufacture of fibre products. The company was organized recently with a capital of $300,000. D. Mason Sutherland, Jr., is president.

W. D. Crooks & Son, Park Street, Williamsport, Pa., manufacturer of doors, sash, etc., have plans in preparation for the erection of a two-story plant addition, 125 x 160 ft., to cost about $75,000.

A vocational department will be installed in the new high school to be erected at Bath, Pa., estimated to cost about $225,000.

The New York Central & Hudson River Railroad Co., Grand Central Terminal, New York, has plans under way for extensions in its engine and car shops at Jersey Shore, Pa., to include an addition to the locomotive shop, boiler shop, machine shop, erecting shop and power house. The new equipment to be installed is estimated to cost about $350,000, of which about $100,000 will be used for the machine shop. The capacity of the power house will be doubled, with installation to include electric generator, boilers, air compressors, pumps, etc.

A vocational department will be installed in the new two-story and basement high school to be erected at Gilberton, Pa.

The Reading Rubber Co., Reading, Pa., has acquired a factory at Kutztown, Pa., formerly used by Jacob K. Boyer as a box plant, and will establish a plant for the manufacture of rubber tubes and kindred products. The machinery installation is estimated to cost about $20,000. The present building will be improved to accommodate the new industry.

In connection with the purchase of the Ironton Railroad line, the Philadelphia & Reading Railroad Co., is reported to be planning for the construction of a locomotive repair shop at the West Catasauqua, Pa., yards, replacing the shop heretofore conducted at the plant of the Thomas Iron Co., former owner of the road.

The Keystone Garage Co., Canton, Pa., is planning for the installation of new machinery and tools at its service and repair works, in an addition now being constructed.

The plant of the Driscoll-Reese Steel Co., Hamburg, Pa., has been acquired by the Gilmore & Thompson Co. The new owner will continue the works in operation and plans for extensions and improvements.

The Rowe-Stuart Motors Corporation, Rossmere, near Lancaster, Pa., has awarded a contract to the Gibbs-Mueller Co., Real Estate Trust Building, Philadelphia, for the erection of a new one-story plant, 120 x 300 ft., for the manufacture of special pneumatic tires and other automotive rubber goods.

In connection with the purchase of the York Haven Water & Power Co., York Haven, Pa., now being consummated by the Metropolitan Edison Co., Reading, Pa., the new owner plans to increase the capacity of the plant. An appropriation of $1,000,000, is being arranged for this and other plant and line expansions. The company is also said to be perfecting arrangements for the purchase of the Lycoming-Edison Co., Williamsport, Pa., and the Lock Haven Electric Light & power Co., Lock Haven, Pa.; additions are planned to both generating plants, that of the Lock Haven campany to be doubled, approximately, in capacity.

The Pennsylvania Railroad Co., Broad Street Station, Philadelphia, has arranged a fund of about $500,000, for the erection of its proposed new steel freight car construction and repair shop at Enola, Pa. A. C. Shand is chief engineer.

A complete machine and repair shop will be established in connection with the new automobile service works now being erected by Horlacher's Garage, Palmerton, Pa.

A vocational department will be installed in the new high school to be erected at Bridgeport, Pa.

Final action in ratifying the purchase of the American Wire Fabrics Co. by the Wickwire-Spencer Steel Corporation was taken at the adjourned meeting of the stockholders, held Friday, Sept. 22, at Worcester, Mass. It was also voted to make various changes in the Wickwire-Spencer capitalization. The corporation, according to present plans, will issue $1,775,000 7½ per cent 10-year secured convertible debentures; will retire Class A common shares and will increase the number of common shares from 250,000 to 600,000, and change the par of common stock from $5 to no par value.

New England

BOSTON, Sept. 26.

SALES of machine tools in this territory during the past week were again small, but a greater number of firms participated than during the previous week. For that reason and because several new prospects have developed and numerous old ones have come to life, the trade is more confident. Of old prospects, those calling for hammers and presses are the most important. Prices are strong. Those tool makers who have not announced advances are tightening up on discount inducements, which virtually amounts to an advance.

Sales for the week include two new 14 in. x 6 ft. lathes, one a tool room and the other a manufacturing tool, to a Rhode Island trade school; four new upright drills, a used 30-in. planer and three new standard lathes to a Springfield, Vt., concern, with additional production equipment under consideration; a new key seat milling machine, to a Lowell, Mass., firm; a used 28-in. x 18-ft. lathe, to an Alabama firm; a new 20-in. drill press to Vermont interests, who are negotiating for an 18-in. standard rating lathe; a used No. 70 Heald grinder, which is going into Pennsylvania; a large Cleveland punch and shear and a 12-in. pipe threader, both used machines, to New Jersey manufacturing interests; and two large used punch and shears, taken for another Alabama account. One used machine tool house reports sales of 10 tools, involving several thousand dollars. The Maine Central Railroad is in the market for a new 28-in. shaper and an 18-in. lathe for a new roundhouse.

E. Ingraham Co., Bristol, Conn., clocks, is completing an additional story to one of its units, giving several thousand additional feet of floor space, to be used for manufacturing purposes.

The Home Accessories Corporation, Worcester, Mass., a new $50,000 concern, has purchased a property at the corner of Gardner and Tainter Streets, that city, which includes a one-story plant. The company expects to soon start the manufacture of bathroom fixtures and kitchen accessories. Walter Enoch, formerly domestic goods department Wickwire Spencer Steel Corporation, Worcester, is president.

The Durham Mfg. Co., Middletown, Conn., sheet metal goods, recently organized with a capital of $25,000, has begun work on a manufacturing plant, 26 x 100 ft. Paul Mathewson is president.

A vocational department will be installed in the proposed East Side High School, to be erected, at a cost of $900,000, by the City of Bridgeport, Conn.

Arnold J. Booth will construct a $150,000 public garage and service repair station on Park Street, Worcester, Mass. It will be three stories, 95 x 103 ft.

The Massachusetts Oil & Refining Co., Quincy Avenue, East Braintree, Mass., will commence the immediate erection of an addition to its local plant, to cost about $50,000. Headquarters are at 209 Washington Street, Boston.

A new one-story power house, to cost about $80,000, will be erected at the plant of the Indian Orchard Co., Indian Orchard, Mass., manufacturer of yarns, etc. McClintock & Craig, Lyman Street, Springfield, Mass., are architects.

The Connecticut Foundry Co., Rocky Hill, Conn., has awarded a contract to C. P. Waterman, Inc., Hartford, Conn., for the erection of a new one-story plant.

The Wickwire Spencer Steel Corporation, Worcester, Mass., has preliminary plans under way for the erection of a new three-story plant, 33 x 100 ft., at Spencer, Mass., to replace a building recently destroyed by fire. It will cost about $45,000.

A vocational department will be installed in the new high school to be erected at Glastonbury, Conn., estimated to cost about $130,000, for which bids will be asked early in October. Brooks & Glazier, Lewis Street, Hartford, Conn., are architects.

The Sexton Can Co., 31 Cross Street, Everett, Mass., has awarded a contract to D. E. McIntyre, Inc., 74 Broad Street, for the erection of a new one-story addition.

The Henshaw Motor Co., 989 Commonwealth Avenue, Brighton, Boston, local representative for the Dodge automobile, has leased property at 12-16 Griggs Street for a new service and repair works.

The Connecticut Light & Power Co., West Main Street, Waterbury, Conn., has broken ground for the erection of its proposed hydroelectric power plant on the Housatonic River, near Devon, Conn., estimated to cost close to $2,000,000. including machinery.

The Boston Elevated Railway Co., 108 Massachusetts Avenue, Boston, has awarded a contract to the Simpson Brothers Corporation, 77 Summer Street, for the erection of its proposed car repair shops at Everett, Mass., consisting of four general machine and equipment buildings, two, 150 x 300 ft. each, and two, 50 x 56 ft. each, and one-story transfer shop, 80 x 730 ft., estimated to cost in excess of $2,000,000, including equipment. Dwight P. Robinson & Co., 61 Broadway, New York, are engineers.

A vocational department will be installed in the new two-story and basement high school, 88 x 165 ft., to be erected at Fort Fairfield, Me., estimated to cost $125,000. for which superstructure work will soon be commenced. H. W. Rhodes, 564 Congress Street, Portland, Me., is architect.

The Sills-Chevrolet Co., Boston, local representative for the Chevrolet automobile, has leased the three-story and basement building at 1249 Boylston Street, corner of Ipswich Street, for the establishment of a new service and repair plant.

A vocational department will be installed in the new two-story high school to be erected at West Hartford, Conn., estimated to cost $450,000, for which bids on a general contract will be received until Oct. 2. W. T. Marchant, 36 Pearl Street, Hartford, is architect.

The United Electric Railways Co., 100 Fountain Street, Providence, R. I., has awarded a contract to Frederick L. Pierce, 170 Westminster Street, for the erection of a two-story automobile service and repair plant, 87 x 250 ft., at Melrose and Russell Streets, with capacity of about 50 company trucks and cars, estimated to cost about $100,000. A list of equipment to be installed will be prepared at an early date. H. W. Sanborn is chief engineer.

The plant of the Connecticut Brass Works, West Cheshire, Conn., has been acquired by new interests, headed by F. Cranston Thomas, president of the National Dyewoods, Ltd. The new owners plan for the erection of an addition and the installation of considerable new equipment.

The International Paper Co., 45 Milk Street, Boston, has tentative plans under consideration for the rebuilding of its pulp mill at Montague, Me., completely destroyed by fire, Sept, 5.

The McLaurin-Jones Co., Ware, Mass., manufacturer of paper products, has arranged for a bond issue of $400,000, a portion of the proceeds to be used for extensions and improvements. The company represents a consolidation of the Ware Coated Paper Co., Ware; Ideal Coated Paper Co., Brookfield, Mass.; and the Samuel Jones Co., Newark, N. J.

The Home Accessories Corporation of Worcester, Mass., manufacturer of bathroom fixtures and kitchen accessories, will build a two-story addition to its factory at Gardner and Tainter Streets, 45 by 112 ft. The company has been organized recently, capital stock $250,000, with Walter Enoch, recently head of the domestic goods department of the Wickwire-Spencer Steel Corporation, as its general manager and president. Irving D. Stern is the treasurer, and the other directors are Clarence J. Abbott and Edwin J. Seward of Worcester and I. Rennamocorr of New York. The company has purchased the business of the Patachet Co. of Stoneham, Mass., and will remove it to Worcester, to concentrate manufacturing in one plant.

The Erie Engine Works, Erie, Pa., filed a voluntary petition of bankruptcy in the United States district court, Pittsburgh, Sept. 20. Liabilities are placed at $261,165.82 and assets at $313,258.95. The liabilities are represented by taxes due states, counties and municipalities of $890.04; wages, $770.86; secured claims, $248,665.38; and unsecured claims $10,830.54. The assets include real estate, $126,000; cash on hand, $54.15; stock in trade, $94,843.25; machinery, tools, etc., $62,522.53; debts due on open accounts, $4,839.04 and insurance policies, $25,000. Attached to the petition is a resolution adopted by the board of directors on Sept. 19, in which it is shown the company is unable to pay its debts, and as a number of judgments recently were obtained against it, the property is in danger of being secrificed. F. C. Lytle is secretary of the company and Adolph A. Claus, treasurer.

The American Seeding Machine Co. report for the year ended June 30, shows a net loss of $714,225, after expenses, as compared with a net loss of $259,226, in the previous year. After preferred and common dividends were paid, the deficit was $1,114,225, against a deficit of $709,226 in the preceding year.

Detroit

DETROIT, Sept. 25.

REPRESENTATIVES of machinery manufactures report a dearth of inquiries. Re-opening of the Ford industries with its far reaching effect on parts manufacturers, and the optimistic feeling generally on the fuel question have strengthened the general opinion that considerable inquiry will be forthcoming during October. It has developed in many cases, especially among automobile manufacturers, that where new equipment was needed to increase production, machinery has been available from their own stocks, having been carried for the past two years.

The Superintendent of Lighthouses, Room 340, Post Office Building, Detroit, will receive bids until 2 p. m., Oct. 10, for furnishing one 27-in. lathe and one 24-in. shaper, both individual motor driven. Information will be furnished on application.

The Monarch Foundry Co., Detroit, manufacturer of gray-iron castings, has been adjudicated a bankrupt by involuntary petition as of Sept. 8. No date has been set for the sale by the referee of the bankruptcy court.

The American Twist Drill & Tool Co., 2804 W. Jefferson Avenue, Detroit, suffered a severe loss by fire recently, the estimated damage being $240,000. The drill department was completely destroyed. Future plans have not been announced pending adjustment.

The Muskegon Motor Castings Co., Muskegon, Mich., has announced that beginning Oct. 1 it will produce light gray-iron pistons in addition to its present line of cam shafts. It is the company's plan to cast and machine this product.

The new power plant at Ludington, Mich., which has been under construction since last December, has been completed at a cost of $300,000. This plant is a unit of the Michigan United Light & Power Co. of Ludington, formerly the Stearns Light & Power Co., and assures this district, consisting of Ludington, Scottville, Pentwater, Hart, Shelby and New Era, of a light and power service.

The Bryant Paper Co., Kalamazoo, Mich., has asked for the stockholders' approval on a $5,000,000 bond issue to cover an extensive building program. Present plans call for the construction of a new power plant of four boilers, to replace four power houses containing 24 boilers; the remodelling of machinery and equipment at the Superior division to increase production and reduce costs; the installation of a central machine shop and supply department and a salvage plant for reclaiming and repairing supplies. The cost of the above program is approximately $1,500,000. Tentative plans to improve the Bryant and Milham divisions at a cost of approximately $2,000,000 are included in the present prospectus.

The Gray Motor Corporation, Mach Avenue and the Detroit Terminal Railroad, Detroit, has completed a new unit 400 x 60 ft. It has under consideration a unit 600 x 60 ft. and a loading track to run between these two new buildings. Present plans call for seven units and an administration building.

The Detroit Board of Water Commissioners has awarded to the D'Olier Centrifugal Pump & Machine Co. contract for furnishing and erecting three 100,000,000-gal. motor-driven centrifugal pumps.

The Acme Saw Co., 522 Fort Street West, Detroit, has been incorporated for the manufacture of band saws. Officers are H. E. Culverwell, president; Donald J. Bryant, secretary and treasurer, and Francis H. McCarthy, vice-president.

The General Testing Laboratories, 525 Woodward Avenue, Detroit, formerly operated by Joseph A. Wolf, has been incorporated with Joseph A. Wolf, president, and Paul H. Kramer secretary and treasurer. For the present its facilities will be devoted to general chemical and physical analysis and research work.

The Aman Foundry Co., Detroit, has been incorporated with a capitalization of $10,000 and has begun the production of gray-iron castings in the plant heretofore occupied by the Liberty Foundry Co., Davison and Turner Avenues. John Aman, formerly president of the Monarch Foundry Co., Detroit, is actively identified with the new company.

The Baker-Perkins Mfg. Co., 1204 Niagara Avenue, Saginaw, Mich., will commence the immediate erection of a one-story addition to its power plant. Cowles & Mutscheller, Chase Building, Saginaw, are architects.

The Robson-Stevens-Mackey Co., Lansing, Mich., local representatives for the Hudson and Essex automobiles, has acquired the plant of the Clark Carriage Works and will remodel and improve the structure for a new service and repair plant.

The Common Council, North Muskegon, Mich., will install an electrically operated pumping plant in connection with extensions and improvements in the municipal waterworks, to consist of two main motor-driven centrifugal pumping units, 350 and 500 gal. capacity per minute respectively, and other auxiliary equipment.

A vocational department will be installed in the new high school to be erected at Port Huron, Mich., estimated to cost about $300,000.

The Martin-Parry Corporation, York, Pa., manufacturer of automobile bodies, is arranging for the immediate occupancy of its new plant at Flint, Mich., comprising a remodeled warehouse formerly used by the Dort Motor Co. Initial production at the works will be devoted to truck bodies for the Durant Motor Co.

The Cadillac Lumber & Chemical Co., Cadillac, Mich., is said to be planning for the installation of mechanical conveying and hoisting equipment at its new local plant. W. L. Saunders is head.

A vocational department will be installed in the new three-story and basement high school, 87 x 120 ft., to be erected at Reed City, Mich., estimated to cost about $100,000.

The Board of Works, Detroit, will build a new two-story power house for municipal service on Byron Street, near Hazlewood Street, estimated to cost about $50,000. Albert Kahn, 1000 Marquette Building, Detroit, is architect.

Pittsburgh

PITTSBURGH, Sept. 25.

BUSINESS in machine tools during the past week has been disappointing. The month began with so much promise that a good many of the trade figured that it was going to prove to be a good one, but actual sales have been below expectations. The Pittsburgh & Lake Erie Railroad has closed for three combination truing machines for which it inquired a few weeks ago, and a local maker of steel pipe recently closed for an 18-in. motor-driven Springfield lathe. The Union Railroad, the interplant transportation system of the Steel Corporation in this district, has put out an inquiry for a 500-ton or 600-ton wheel press.

Interest in heavy equipment is well sustained. The Jones & Laughlin Steel Co. has put out an inquiry for a 50-ton crane, with 10-ton auxiliary, to serve the new power house for which the company recently placed a 10,000-kw. steam turbine with the General Electric Co. The Jones & Laughlin company also is taking bids on five cranes for installation at its Southside Pittsburgh works. The Pennsylvania Railroad has put out an inquiry for 17 cranes in connection with the rebuilding of its Juniata shops, Altoona, Pa. The list includes two 250-ton locomotive handling cranes; ten 15-ton, four-motor standard cranes, with 10-ton auxiliaries; four 60-ton double-trolley cranes and one 10-ton high speed crane. The Koppers Co. is expected to close this week for the oven pushers and other equipment in connection with its contracts for the by-product plant of Weirton Steel Co. and the extension of the Clairton, Pa., by-product plant of Carnegie Steel Co. The Northern Engineering Works has taken three 2-ton coal hoists for a Pittsburgh district user and the Milwaukee Electric Crane & Mfg. Co. has taken three bucket trolleys, cab control, for the West Penn Power Co. for installation at Windsor, W. Va. The Youngstown Steel Co., which is putting up a mechanical puddling plant at Warren, Ohio, has closed for six cranes with Morgan Engineering Co., Alliance, Ohio.

The Graham Nut & Bolt Co. 1317 West Carson Street, Pittsburgh, has awarded a contract to Harding & Crea, White Building, Buffalo, for the erection of a plant on Neville Island, to cost about $95,000.

The Duquesne Light Co., Pittsburgh, will build a new one-story plant at 1305-7 Sarah Street, to cost about $35,000.

The Fairmont Creamery Co., 301 Ferry Street, Pittsburgh, will build a new one-story automobile service and repair works for company trucks and cars at Twenty-fifth and Smallman Streets, with general warehouse building, the two structures to cost about $150,000.

The Board of Education, Monaca, Pa., is said to be arranging a list of equipment for installation in the vocational department at the new local high school.

The Centre Foundry & Machine Co., 2011 Main Street, Wheeling, W. Va., has awarded a contract to the Riverside Bridge Co., Martins Ferry, Ohio, for erection of a one-story foundry on Warwood Avenue, 100 x 320 ft., estimated to cost about $35,000. J. H. Young is general manager.

The Brady-Warner Coal Corporation, Fairmont, W. Va., has arranged for a bond issue of $1,000,000, the proceeds to be used for plant extensions, to include the installation of new mining machinery, electric equipment, mine cars, etc.

A vocational department will be installed in the new two-story and basement high school to be erected at New Martinsville, W. Va., estimated to cost about $125,000.

The Pond Creek Coal Co., Williamson, W. Va., recently organized with a capital of $500,000, is planning for the installation of equipment, including power equipment, hoisting and mining machinery, mine cars, etc. T. N. Daugherty heads the company.

The Warren Sand & Gravel Co., Russell, Pa., is planning for the installation of new screening, conveying, hoisting and other equipment in connection with the rebuilding of its plant, recently destroyed by flood.

Cleveland

CLEVELAND, Sept. 25.

MACHINERY dealers are getting a fair volume of inquiries for single machines, the prospective business including several large tools. As a whole, sentiment in the trade has improved, although orders this month have fallen short of expectations. While some machine tool manufacturers and dealers have had more business during September than in August sales by others have shown a falling off this month. Very little business is coming at present from the automobile field and no sales are reported in the railroad field during the week excepting a single machine. Makers of automatic screw machinery and turret lathes report a few orders for single machines. Pickands, Mather & Co. have not yet made any purchases against their list of nine metal and woodworking machines for use in connection with an ore mine and are trying to line up used machinery. The Otis Steel Co. is expected to purchase some shearing machinery shortly, but has not yet indicated its requirements.

Additional price advances were announced during the week. The National Acme Co., Cleveland, has advanced its automatic screw machinery 5 per cent to 7½ per cent on most sizes and the American Tool Works, Cincinnati, has advanced lathes and drilling machines approximately 10 per cent.

There is still considerable activity in the hydroelectric field. The Wellman-Seaver-Morgan Co., Cleveland, has taken three 6,000 hp. vertical turbines with 105 ft. head for the United Hudson Electric Co., Poughkeepsie, N. Y., the order being placed through the J. G. White Engineering Corporation, New York. The equipment will be installed near New Platz, New York. The generator equipment will be supplied by the General Electric Co. The J. P. Morris Co., Philadelphia, has taken an order for two 11,000 hp. turbines with 75 ft. head and parts to go into concrete for two additional turbines to be installed in the Piney Creek Development of the Clarion River Power Co. in Pennsylvania. It is understood that this power company is working on two other developments in the same vicinity and that eventually installations will be made providing approximately 300,000 hp.

The Alliance Machine Co., Alliance, Ohio, has recently taken the following crane orders:

For International Harvester Co., two 175-ton, four-girder ladle cranes with 54-ft. span; one 100-ton, four-girder ladle crane with 78-ft. span; two 7½-ton open-hearth charging machines; two 10-ton standard cranes with 100-ft. span, and one 5-ton monorail hoist.

For Inland Steel Co., two 15-ton, double-drum cranes with 90-ft. span; one 75-ton, 5-motor crane with 80-ft. span.

For National Enameling & Stamping Co., through the United Engineering & Foundry Co., one 40-ton, 4-motor crane and one 10-ton, 3-motor crane, both with 75-ft. span, and one 10-ton, 3-motor crane with 40-ft. span.

For Maryland plant of Bethlehem Steel Co., Baltimore, two 150-ton, 4-girder ladle cranes with 65-ft. span, one 15-ton soaking-pit crane, and two 10-ton standard cranes with 80-ft. span and one 10-ton repair trolley.

For Mold & Mfg. Co., one 20-ton, 4-motor crane with 60-ft. span.

For Central Steel Co., one 2-ton floor slab charging machine.

For Wickwire Steel Co., one 15-ton magnet handling trolley.

For Rogers Brown & Co., one 6-ton magnet handling trolley. Recent orders also include seven cranes for the Otis Steel Co., Cleveland, the purchase of which was previously announced.

The Vapo Stove Co., Lima, Ohio, which has outgrown its present quarters, has made arrangements for the erection of a new plant in Lima. A separate corporation has been formed to erect the plant which the stove company plans eventually to purchase.

The Toledo Libbey-Owens Sheet Glass Co., Toledo, Ohio, is having plans prepared for the erection of a large plant near Toledo.

The Ravenna, Ohio, Chamber of Commerce has closed a contract for F. W. Phillips and associates of Cleveland to locate an automobile body plant in that city. The plans provide for the completion and equipping of the buildings of the McElrath Tire & Rubber Co. for use as a body plant.

The Fremont Metal Body Co., Fremont, Ohio, has acquired a site on which it plans to erect a factory.

Gallagher Brothers, Uhrichsville, Ohio, are erecting an addition to their machine shop which will be used for jobbing repair work.

H. K. Ferguson Co., Cleveland, has taken contracts recently for extensions to four plants in the automotive field. These include a factory building 80 x 440 ft. for the Maxwell Motor Co., Detroit, a six-story and basement building, 183 x 320 ft. for the Dayton Engineering Laboratories, Dayton, Ohio, a large extension for the Nash Motor Co., Milwaukee, and a spoke-turning plant and power house for the Hayes Wheel Co., Jackson, Mich.

Baltimore

BALTIMORE, Sept. 25.

The Toledo Bottle Cap Co., Toledo, Ohio, has leased about 6,000 sq. ft. of space in the Candler Building, Baltimore, for a branch plant for the manufacture of bottle caps and capping devices.

The Consolidated Gas, Electric Light & Power Co., Lexington Building, Baltimore, will build a new three-story plant, 105 x 227 ft., at 501-31 Madison Street, to cost about $113,000.

The General Purchasing Officer, the Panama Canal, Washington, will receive bids until Oct. 12 for supplies for the Canal Zone, including steel rivets and bolts, wire nails, electric motor, fans, cables, wire, voltmeter, steel conduit, wire grips, electrical supplies, valves, and other miscellaneous equipment as specified in Circular 1496.

The Lambert-Hudson Motors Co., Washington, local representative for the Hudson automobile, will build a new two-story automobile service and repair building, 75 x 130 ft., at Twenty-second and M Streets.

The Eastern Shore Electric Co., Harrington, Del., has acquired the plant and property of the Kent County Electric Light Co., Seaford, Del. Extensions and improvements are planned in the present power plant and system.

The Board of Harbor Commissioners, Municipal Building, Wilmington, Del., has arranged for a fund of $700,000 for the purchase of machinery and equipment for the new municipal marine terminal now under construction.

Pusey & Jones, Inc., Wilmington, Del., operating a local shipbuilding plant and now in receivership, is perfecting plans for a complete reorganization. The change will be made within the next 60 days.

The Common Council, Davidson, N. C., is planning for a bond issue of $60,000 for the installation of a municipal power plant and waterworks extensions.

A vocational department will be installed in the new two-story high school to be erected at Smyrna, Del., estimated to cost $165,000. Bids on equipment will be called for soon. The Delaware School Auxiliary, Wilmington, is in charge.

A one-story power house addition to cost about $50,000 will be constructed at the Virginia Polytechnic Institute, Blacksburg, Va.

Fire on Sept. 18 destroyed a portion of the plant of the P. A. Thomas Car Works, Inc., High Point, N. C., manufacturer of electric traction cars and equipment, with loss reported at $250,000, including machinery.

A vocational department will be installed in the new high school to be erected at Newark, Del., estimated to cost about $400,000, including equipment.

The Standard Electric Co., 1821 East Main Street, Richmond, Va., operating a general repair and service works, is planning for the installation of new equipment.

The Southern Bobbin & Spool Co., Greenville, S. C., recently organized with capital of $100,000, has awarded a contract to the Gallivan Building Co., Greenville, for the erection of a new two-story plant, 40 x 130 ft., to cost about $35,000, to be equipped for the manufacture of textile machine equipment.

The Pennsylvania Railroad and the Norfolk & Western Railroad will establish a joint locomotive plant, with repair facilities, at Hagerstown, Md.

The Battery Machinery Co., Rome, Ga., is planning for the installation of new equipment at its plant, including belt-driven air compressor, elecmotor and other apparatus. A. Butler is in charge.

The Beckerley & Trusler Co., 306 Stewart Building, Baltimore, machinery dealer, is making inquiries for a 20 in. 8 ft. metal lathe.

A vocational department will be installed in the proposed new high school to be erected on Peach Avenue, South Boston, Va., estimated to cost about $100,000.

Indiana

INDIANAPOLIS, Sept. 25.

The Ford Motor Co., Highland Park, Mich., has commissioned Albert Kahn, 1000 Marquette Building, Detroit, architect, to prepare preliminary plans for the erection of its proposed new plant at Hammond, Ind., to be used for assembling work, with initial daily capacity of about 15,000 cars.

The plant of the American Hominy Co., Terre Haute, Ind., was practically destroyed by fire on the night of Sept. 13, the damage being estimated at $1,000,000. Plans for rebuilding are now being made.

The Studebaker Corporation, South Bend, Ind., has completed plans for the erection of a new one-story addition to its power plant on Tuttle Street, estimated to cost about $125,000.

The Midwest Engine Corporation of Delaware, Indianapolis, has been organized to acquire the plant and property of the Midwest Engine Co. of Indiana, operating under a receivership for some time past. A consideration of $2,000,000 has been given by the new company for the plants at Indianapolis and Anderson, Ind., and plans are being perfected for the resumption of full operations. A bond issue of $3,000,000 is being arranged, a portion of the proceeds to be used for extensions and improvements.

The Commonwealth Edison Co., 72 West Adams Street, Chicago, is considering tentative plans for the erection of a new power plant at Hammond, Ind., to cost about $100,000.

A vocational department will be installed in the new senior and junior high school at Plymouth, Ind., two-story and basement, 163 x 180 ft., for which revised plans are now being prepared. Bids received on former plans have been rejected. Ernest W. Young, 512 Dean Building, South Bend, Ind., is architect.

The Indiana Battery Service Co., 1007 North Meridian Street, Indianapolis, local representative for the Millburn electric automobile, has acquired property at 1136 North Meridian Street, 80 x 320 ft., as a site for a new service and repair plant, with complete machine and electrical repair departments. Plans are being prepared for a one-story building. Henry C. Churchman is president.

The Associated Motor Industries, Inc., Indianapolis, recently organized with a capital of $40,000,000, to take over and merge a number of automobile interests, has perfected plans for immediate plant acquisition and operation under the new arrangement. The different plants include the National Motor Car & Vehicle Corporation, Indianapolis; Traffic Motor Truck Corporation, St. Louis; Recording & Computing Machine Co., Dayton, Ohio; Kentucky Wagon Mfg. Co., Louisville; Covert Gear Co., Lockport, N. Y.; M. & T. Corporation, Boston; Jackson Motors Corporation, Jackson, Mich.; and the Saginaw Sheet Metal Works, Saginaw, Mich. The company will concentrate operations at all plants on the manufacture of passenger automobiles of four and six-cylinder type, and on motor trucks from 1 to 3½ tons capacity. All other lines and special parts heretofore produced at some of the plants will be discontinued.

The Central South

ST. LOUIS, Sept. 25.

OF the machine tools and allied equipment listed in the inquiry of the Missouri-Kansas-Texas Railroad, which closed on Sept. 18, four milling machines and an electric crane were purchased. Two each of the milling machines were placed with Blackman-Hill-McKee Machinery Co. and Elliott & Stephens Machinery Co., both of St. Louis, and the crane order went to the Whiting Corporation, Chicago. The remainder of the list probably will be placed within the next few weeks. The equipment, which is for the shops at Bellmead, near Waco, Tex., probably will not be required for the next four or five months.

Manufacturers of piston rings, in which St. Louis leads, are doing an excellent business. That is the only field, outside of the railroads, that has shown any interest to speak of in machine tools. The Unico Motor Products Corporation. and the Inland Machine Works, both manufacturers of piston rings, each have purchased two Person & Arter automatic piston ring grinding machines.

The Automatic Water Pump Mfg. Co., 236 East High Street, Jefferson City, Mo., will take bids in October for the erection of a one-story plant, estimated to cost about $100,000, including equipment.

The Sheet Metal Products Co., 1819 Central Street, Kansas City, Mo., has plans for the erection of a one-story plant, 125 x 300 ft., at Thirteenth and Chestnut Streets, estimated to cost about $60,000. Wilkinson & Crans, 608 Interstate Building, are architects.

The Crossett Lumber Co., Crossett, Ark., will commence the immediate construction of a new power house at its plant.

The Common Council, Caruthersville, Mo., has plans under consideration for rebuilding the municipal electric power plant and ice-manufacturing plant recently destroyed by fire.

The United Railways Co., Thirty-ninth Street and Park Avenue, St. Louis, is completing plans for the erection of a number of new one-story power houses in different parts of the city.

An appropriation of $1,000,000 has been arranged by the Missouri, Kansas & Texas Railroad Co., St. Louis, for the erection of a new grain elevator at the Southwest Boulevard and Mill Street, Rosedale, Kan., to include electrically-operated hoisting machinery and other equipment.

Wyatt Wolf, Mountain Home, Ark., is organizing a company to construct and operate a local electric light and power plant and cold storage and refrigerating plant. Plans will soon be drawn.

The Atchison, Topeka & Santa Fe Railway Co., 80 East Jackson Boulevard, Chicago, has awarded a contract to the Wear Construction Co., El Paso, Tex., for the erection of a new one-story locomotive and car shop at Wynoka, Okla.. to cost approximately $50,000.

The Kansas Gas & Electric Co., Wichita, Kan., has arranged for a bond issue of $3,000,000, a portion of the proceeds to be used for extensions and improvements. A. S. Grenier is vice-president.

The Joplin Supply Co., Joplin, Mo., has awarded a contract to the C. A. Dieter Constuction Co., Joplin, for the erection of a five-story automobile service and repair building, 75 x 120 ft., to cost about $200,000.

Greathouse Brothers, Louisville, operating a machine shop at 654 South Ninth Street, are planning for the installation of new punches, shears and other equipment.

A vocational department will be installed in the proposed new two-story high school to be erected at Sapulpa, Okla., estimated to cost about $125,000.

The Knoxville Power & Light Co., Knoxville, Tenn., is arranging for an increase in capital from $2,050,000 to $10,000,000, a portion of the proceeds to be used for extensions and improvements.

The North American Oil Co., Oklahoma City, Okla., has been organized with capital of $35,000,000 to take over and merge the following companies operating in Oklahoma and neighboring sections: North American Oil & Refining Co. Noco Petroleum Co., Noco Production Co., Noco-Mexican Oil Co., Puritan Petroleum Co., Black Petroleum Co., Lesh Oil Products Co., Noco Pipe Line Co., and the Petroleum Transit Co. The new company is planning for extensions in present oil refineries and systems, and for the construction of additional refineries at a later date. C. F. Colhord is president.

W. S. Taffar, Gainesville, Ga., has leased property at Athens, Ga., for a plant for the manufacture of show cases and kindred products. The structure will be improved and machinery installed at an early date.

The Ford Motor Co., Detroit, has leased a two-story and basement building, 150 x 300 ft., to be erected at Main Street and the line of the St. Louis-San Francisco Railroad, Tulsa, Okla., by Frank M. McCullough and associates, First National Bank Building, for the establishment of a new assembling plant. It will cost about $125,000. Stone & Deegan, 301 Drexel Building, are architects.

The Lexington Mine & Mill Supply Co., 544 West Main Street, Lexington, Ky., has taken bids on a four-story and basement works, 50 x 210 ft., on West Main Street, to cost about $55,000.

A vocational department will be installed in the new three-story high school to be erected at Vandalia, Mo.

The Caddo Power & Irrigation Co., Little Rock, Ark., is perfecting plans for the erection of two new hydroelectric power plants on the Ouachita River, near Hot Springs, Ark. The site for the first station will be located about five miles from the city, with estimated cost of development, including equipment, of $3,000,000. The second station will be located at Blanchard Springs, and will cost close to $5,000,000, with machinery. The combined capacity will approximate 100,000 hp. It is also planned to construct a transmission system. H. L. Remmel is president.

A vocational department will be installed in the new high school to be constructed at Morristown, Tenn.

The Goldthorpe Refining Co., Oklahoma City, Okla., has been acquired by George Smith, Oklahoma City, and associates. The new owners will reorganize the company, and have plans under way for extensions, including the installation of additional machinery.

The Gulf States

BIRMINGHAM, Sept. 25.

The Southern Wire & Iron Works, Atlanta, Ga., has acquired property at Dallas, Tex., as a site for a new plant. Plans are being prepared for the erection of four one-story units, estimated to cost approximately $60,000.

The Common Council, St. Petersburg, Fla., will commence the immediate erection of a new municipal electric power plant, estimated to cost $55,000.

An electric pumping plant will be installed at the proposed new sewerage disposal plant to be constructed by the Board of City Commissioners, Forth Worth, Tex., to cost about $750,000.

The Abbott-Stuart Sign Co., 2814 Main Street, Dallas, Tex., is planning for the establishment of a new plant for the manufacture of electric signs and operating displays.

The Houston Power Co., Newton, Ala., has plans nearing completion for the construction of a new hydroelectric generating plant near Waterford, Ala., with initial capacity of about 3,000 hp. The Southern Engineering Corporation, Albany, Ga., is consulting engineer.

The Virginia Bridge & Iron Co., Roanoke, Va., has work in progress on eniargements and remodeling at the former plant of the Birmingham Steel Corporation, Birmingham, Ala., and will arrange the works for steel railroad car construction and repair. It is planned to have the entire plant equipped and ready for service at an early date.

The Texas & Pacific Railroad, Dallas, Tex., has plans in progress for extensions and improvements in its locomotive shops at El Paso, Tex., estimated to cost about $50,000. E. F. Mitchell is chief engineer.

The Great Lakes Western Refining Co., Houston, Tex., has acquired the local plant and property of the Port Houston Refining Co. The new owner is planning for the erection of a new oil refining plant, with initial capacity of about 3500 bbls. per day.

The Gulf Refining Co., Port Arthur, Tex., is arranging for the purchase of property totaling about 100 acres in the vicinity of its present plant, and will use a portion of the land for the construction of an addition to the oil refining plant, to double approximately the present output. A new steel tankage department will also be installed. George H. Tabor is vice-president.

A vocational department will be installed in the new high school to be erected at Canton, Miss., estimated to cost about $125,000.

Glen C. Tobias, Houston, Tex., is organizing a new company with capital of $5,000,000, to construct and operate a local plant for the manufacture of steel products. A portion

of the works will be equipped for reclaiming scrap iron The initial plant is estimated to cost close to $500,000.

A vocational department will be installed in the new high school to be erected at Crystal Springs, Miss., estimated to cost about $80,000.

The Lubbock Iron Works, Lubbock, Tex., has removed its plant from the property heretofore occupied at Thirteenth Street and Avenue J, to another location, to provide for expansion in a number of departments.

The Common Council, Clifton, Tex., is planning for the erection of an addition to the municipal electric light and power plant to cost about $25,000, including equipment. Bonds have been approved.

A vocational department will be installed in the new three-story high school to be erected at Cisco, Tex., to cost about $160,000.

The Pacific Coast

SAN FRANCISCO, Sept. 23.

The Los Angeles Shipbuilding & Drydock Co., Los Angeles, is negotiating for the purchase of the plant of the Hanlon Shipyards & Drydock Co., Oakland, Cal., comprising about 33 acres, with drydock, shipyard, etc. The company plans to use the property as a branch plant, and will make a number of extensions and improvements.

The Martin Iron Works, Los Angeles, will build a new one-story plant, 90 x 115 ft., on East Twenty-eighth Street, near Naomi Avenue, to be equipped for iron and steel production.

The Utah Power & Light Co., Salt Lake City, Utah, has arranged for a preferred stock issue of $2,112,000, a portion of the proceeds to be used for extensions and improvements. D. F. McGee is vice-president.

The Los Angeles Railway Co., Pacific Electric Building, Los Angeles, has awarded a contract to the Lynch-Cannon Construction Co., Chapman Building, for the erection of a one-story car repair shop, 95 x 440 ft., on Fifty-fourth Street, near South Park Avenue, estimated to cost about $150,000. The engineering department of the company is in charge.

The Portland Railway, Light & Power Co., Portland, Ore., has arranged for a bond issue of $2,500,000, a portion of the proceeds to be used for extensions and improvements. Franklin T. Griffith is president.

The American Fire Brick Co., Mica, near Spokane, Wash., is planning for the rebuilding of the portion of its No. 2 plant, recently destroyed by fire with loss estimated at about $35,000, including equipment.

A vocational department will be installed in the new high school to be erected at Selma, Cal., estimated to cost in excess of $250,000, for which the time of receiving bids on a general contract has been extended from Sept. 25 to Oct. 10. Norman F. Marsh, 211 Broadway Central Building, Los Angeles, is architect.

Canada

TORONTO, Ont., Sept. 23.

MORE activity is now reported in the machinery and machine tool market and local dealers say that they are beginning to get results from demonstrations at the Canadian National Exhibition recently held in Toronto, and actual sales on this account are steadily mounting. Sales of equipment for garage purposes have improved considerably during the past couple of weeks.

The Canadian National Railways has issued a fairly good sized list of equipment required at the St. Malo, Que., and the Moncton, N. B., shops. In Canadian machine tool circles it is the general opinion that this list is long overdue and that even more extensive buying will be necessary in the early future, as it is generally known that railroad shops are in need of equipment for replacement purposes on a much more extensive scale than any list so far issued would seem to indicate.

The list for the St. Malo, Que., shop includes: One No. 2 Brown-Sharpe surface grinder; one No. 2A Brown-Sharpe universal milling machine; one electric drill; one funnel former; three chain blocks; one pneumatic molding sand rammer; one slip-roll forming machine; one No. 224 combined shear and punch; one No. 2 magnetic chuck; one No. 2 spindle pattern centering machine; one high speed power hack saw; one portable boring bar with motor; one portable oil rivet forge; four one-ton jib cranes; two half-ton jib cranes; one one-ton air hoist; three geared drills with motor drive; one small turner with stand complete; one LeBlond heavy duty production; one hairpin loop armature coil winder and spreader; one coil winding lathe head; one model C turbine air planer; one pneumatic punch; one emery-wheel dresser; one Davis expansion boring tool; four pneumatic chipping hammers; four pneumatic drills; two pneumatic grinders; one single bar shearing machine; one Bertram special crank pin turning and quartering machine; two quick change gear engine lathes. For the Moncton, N. B., shops the list includes two No. 13 crucible furnaces (Stewart); one combined shearing and hot punching machine; one 100-ton hydraulic banding press; one 100-ton spring stripping press.

In connection with the erection of its $2,500,000 oil refinery at Calgary, Alta., the Imperial Oil Co., Church Street, Toronto, Ont., is calling for tenders on a list of tools including lathes, planers, grinders and other machinery and equipment necessary in making and repairing oil refinery equipment.

The Eugene Phillips Electrical Works, which is erecting a plant at Brickville, Ont., expects to have the plant completed about Oct. 15. The company has installed upwards of $350,000 worth of equipment. The plant will be used entirely for the production of copper rods, etc.

McDougall & McNeill, Vancouver, B. C., have secured the general contract for the erection of a pulp and paper mill for the Wigwam Pulp & Paper Co., Elko, B. C., to cost approximately $3,000,000. Construction work will be started immediately.

The Hull Electric Co., 117 Main Street, Hull, Que., will start work next year on the erection of a hydroelectric power plant in Low Township, to have a capacity of 150,000 hp., and will take about two years to complete. The cost of the construction and equipment will be approximately $10,000,000.

The Dominion Insulator Co., manufacturer of insulators and other electrical accessories and equipment, is erecting a plant at Niagara Falls, Ont.

The Glen Motor Car Co. is preparing to establish a plant at Niagara Falls, Ont.

The Robert Mfg. Co., Lockport, N. Y., makers of knives for paper cutting in paper mills, has started work on the erection of a steel and concrete factory at Niagara Falls, Ont.

IRON AND INDUSTRIAL STOCKS

Decline Early in the Week with Recoveries Toward the Close

The bewilderment which prevailed throughout the week in the general market was felt no less in iron and steel stocks, though a few issues, including Baldwin Locomotive and American Can, rose against the trend. Monday's sharp decline was followed by intermittent advances and declines, ending with good recoveries on Saturday. Gulf States Steel before Saturday's closing equaled the year's high at 90. Republic suffered abrupt declines owing, it is believed, to news from Washington that the Federal Trade Commission will investigate the triple merger. Industrial prospects look brighter and the tendency to remove recent premiums has already set in. Most of the week's perplexing irregularity, it is generally thought, is attributable to professional speculators who sought to make large of the war scare.

The range of prices on active iron and industrial stocks from Monday of last week to Monday of this week was as follows:

Allis-Chalmers ..	55	58	Inland Steel	49¼	49⅝
Allis-Chal. pf....	103	104	Int. Har.	109½	111⅝
Am. B. S. & Fdy.	77⅜	83	Int. Har. pf.....	119	119
Am. Can	58¾	62	Lackawanna St..	81	88
Am. Can pf.....	109½	109¾	Lima Loco.	59¼	62¼
Am. Car & Fdy..	184	187	Midvale Steel ..	33½	36⅜
Am. Loco.	121	124⅛	Nat.-Acme	14½	15⅞
Am. Loco. pf...	113½	115½	Nat. Enam. & St.	59¼	62⅛
Am. Radiator ..	117⅞	124	Nat. E. & S. pf..	100	102¾
Am. Steel Fdries.	42½	44⅞	N. Y. Air Brake	82	84⅞
Am. St. Fd. pf..	105	106	Nova Scotia St..	36¼	36¼
Bald. Loco.	132¼	133	Otis Steel	10⅝	11⅜
Bald. Loco. pf...	115	115¼	Pressed Steel Car	88¼	92¼
Beth. Steel	75	76	Pressed Steel pf.	104½	105¾
Beth. St. Cl. B..	75¼	78¼	Ry. Steel Spring.	116¼	120
Beth. St. 8% pf..	111	113	Ry. Steel Sp. pf.	115	115
Brier Hill	18¾	19	Replogle Steel...	32⅜	34½
Br. Em. Steel...	14⅝	14⅜	Republic	65½	70¾
Br. Em. St. 2 pf.	35½	36½	Republic pf.	91	92½
Cambria Steel ..	40	40	Sloss	48	50
Chic. Pneu. Tool	80½	84⅞	Sloss pf.	78	78
Colo. Fuel	33⅛	35½	Steel of Canada.	72½	77
Crucible Steel ..	87	92	Un. Alloy Steel..	38¼	38¾
Crucible St. pf..	96¾	9 ¾	U. S. Steel.....	102½	104⅛
Deere pf.	76	76	U. S. Steel pf...	122	123
Gen. Electric ...176		180	Vanadium Steel.	47	51½
Gt. No. Ore Cert.	39½	41	Va. I., C. & Coke	56¼	56¼
Gulf States Steel	78	90	Wh'ouse Air Br.	102	103⅞

Trade Changes

W. Newton Jeffress, who has been connected with the sales department, Philadelphia district, of the Carnegie Steel Co. for over 20 years, has resigned and has established a sales office in the International Building, 1319 F Street, N. W., Washington, as direct sales representative of the following companies: The Boss Nut Co., Chicago; The Pittsburgh Knife & Forge Co., Pittsburgh; Standard Seamless Tube Co., Pittsburgh; Union Draft Gear Co., Chicago; Universal Draft Gear Attachment Co., Chicago; Verona Tool Works, Pittsburgh. Mr. Jeffress is well known in the Eastern railroad circles, particularly in the Baltimore, Washington and Southeastern districts.

W. N. JEFFRESS

The Modern Machinery Co. has removed its offices from 182 Centre Street, New York, to 25 Church Street. Its plant will remain at the former address. S. A. DeWitt, secretary-treasurer of the company, has resigned.

L. J. Krom, metallurgical engineer, who has served in advisory capacity with several steel and manufacturing companies here and abroad for a number of years, has established an office at 50 Church Street, New York, to conduct a consulting, metallurgical and engineering practice. Mr. Krom has 15 years of practical experience to draw from, and for 11 years was managing editor of *Metal Industry*. Latterly he has designed rolling mills, smelting plants and shops in Europe and Asia.

The B. C. Ames Co., Waltham, Mass., has acquired an interest in the Triplex Machine Tool Corporation, 18 East Forty-first Street, New York, and the Triplex combination lathe, milling machine and drill press is now being manufactured in the plant of the former company. General offices and show room of the Triplex company will remain at the same address.

The Chicago Flexible Shaft Co., Roosevelt Road and Central Avenue, Chicago, has opened a new district sales office, with headquarters at 305 Merchants Bank Building, Indianapolis, to handle furnace sales in southern Ohio and Indiana, and western West Virginia. F. W. Odemar is in charge.

The Angle Steel Tool Co., steel chairs and factory equipment, which began operations about 11 years ago at Otsego, Mich., recently moved to its new daylight factory at Plainwell, Mich. The new location offers considerable advantage over the old, since shipments now can be made over two steam roads and one electric.

Alfred Box & Co., Inc., Philadelphia, electric and hand cranes and hoists, opened a factory branch office at 30 Church Street, New York, on Sept. 15. N. C. Fallor, an engineer who has specialized in handling these lines, is in charge. This is the beginning of a plan to establish direct factory branches in a number of large business centers.

Announcement has been made of the consolidation of the Foamite Firefoam Co., 151 Fifth Avenue, New York, and O. J. Childs Co., Inc., Utica, N. Y., into a new organization to be known as the Foamite-Childs Corporation. The new company will handle chemical and motor fire apparatus, system installations and sprinkler systems. It will continue to develop the Firefoam method of extinguishing fires. The following officers were elected: W. J. Childs, president; F. M. Watters, vice-president; E. Janeway, secretary, and F. J. Maginniss, treasurer. Executive offices will be located at Utica, N. Y.

The Economy Fuse & Mfg. Co., Greenview Avenue, Chicago, has removed its Detroit sales office from 1012 Majestic Building to 1528 First National Bank Building.

The Diamond Chain & Mfg. Co., Indianapolis, announces the opening of an office at 340 Leader-News Building, Cleveland. H. I. Markey, for five years mechanical engineer with the Diamond Chain Co., will be in charge.

The United Brass Mfg. Co., Cleveland, announces that the co-partnership consisting of Benjamin F. Klein and William J. Schoenberger, which constituted that company, has been dissolved by mutual consent, effective Sept. 1. This company continues as before to manufacture water works brass goods under the sole ownership of Mr. Klein. Mr. Schoenberger takes over the gas valve and stove cock department, which will be operated by the W. J. Schoenberger Co., Harvard Avenue, Cleveland.

Plans of New Companies

The Modern Truck Mfg. Co., Box No. 1589, Mobile, Ala., has been incorporated with a capital of $50,000, to manufacture motor trucks, parts, etc. It has taken over the plant of the Marine Equipment Co., Tacon Station, Mobile, Ala.; also the Modern Welding & Blacksmithing Co., Inc., same city, and has removed the latter, with its equipment, to the Tacon plant. This combined plant now has a large foundry, machine shop welding plant, galvanizing plant and pattern shop. The new company is already manufacturing transmission gears, welding products, patterns and all-steel boltless hand trucks. G. M. Bryde is general manager and M. B. Scholtes is plant manager.

A consolidation of the Goodman-Krohngold Co., Cleveland, the Goodman Engineering Co., Zanesville, Ohio, and the Electrical Repair & Engineering Co., same city, has been effected, the new company to be known as the Industrial Electric Co., 5226-32 St. Claire Avenue, Cleveland. I. E. Goodman will head the firm and E. Levison is chief engineer. This firm will specialize in power equipment engineering, machinery and iron trade products.

The Arnold-Hellmuth Mfg. Co., 164 Emmett Street, Orange, N. J., was recently incorporated with a capital stock of $30,000, to manufacture machine tools and parts. The incorporators are: K. P. Hellmuth, A. W. and R. L. Arnold.

The Standard Enameling & Mfg. Co., Box 308, Camden, N. J., has been incorporated with a capital stock of $125,000, to manufacture stamped metal and enameled products. It is in the market for equipment for its new plant, which it is expected will be completed by Jan. 1. The incorporators are: O. S. Watts, J. Predow and M. Redi.

I. D. White, Inc., 115 North Desplaines Street, Chicago, has been incorporated with a capital of $15,000, to manufacture sheet metal products, light stampings and various specialties. The new company is a reorganization of a partnership whose properties and business it is taking over. It has adequate space and facilities for the present, but contemplates moving to larger quarters by next May. The officers of the company are: I. D. White, president and general manager; A. Miller, secretary and treasurer, and H. Harvey, vice-president.

The Paramount Machine Co., 207 Market Street, Newark, N. J., has been organized to manufacture engraving machines and tools. Its work is being done by contract. Samuel Clark, 241 Virginia Avenue, Jersey City, N. J., heads the company.

The Lackner Products Corporation, 132 West Sixteenth Street, New York, was recently incorporated under the Delaware laws with a capital stock of $500,000, to manufacture automatic wire rope cable lines and other mechanical equipment. It is now in experimental quarters, but expects to establish in New York or at Long Island City. Though bids have been asked, no contracts have been awarded, pending final approval of materials to be used, by the Underwriters' Laboratories, with whom it expects to co-operate. Among the devices which the new company will manufacture are: automatic, gravity operating rope clamps; steel cable roof anchors with snap-lockhook terminals and torsion grip tie; and steel cable, belt-trolley safety devices.

The Security Products Co., 255 Mill Street, Rochester, N. Y., has been incorporated with a capital of $25,000, to manufacture automobile parts and kindred products. Its needs are supplied for the present. L. H. and M. C. Harold and A. J. Gosselin are the incorporators.

The Pan-American Equipment Co., Canal-Commercial Building, New Orleans, has been organized by R. L. Wilson, formerly an officer of the Mid-Continent Equipment & Machinery Co., St. Louis, and will do a general rail and railroad equipment business, including cars, locomotives and track accessories.

Hoover-Rudge, Inc., 15 Park Row, New York, was recently organized for the purpose of manufaturing automobile accessories, but for the present will confine its operations to making a special sun shield. Its work will be let out to contract for a time. Eventually the company expects to equip its own plant. Z. L. Hoover is secretary.

The E. L. Essley Machinery Co., Chicago, has added four men to its sales force as follows: H. A. Bruce has been appointed representative in the Michigan territory, having been formerly connected with the Packard Motor Car Co. of Detroit and long identified with the machine tool industry. C. B. Burns, formerly with the Fairbanks Co., Chicago, and T. P. Nielsen have been appointed representatives in Chicago; and Ralph Wirth, formerly with the Toledo Press & Machine Co., also the Niagara Machine & Tool Works, has been appointed special representative in the sheet metal machinery department.

NEW TRADE PUBLICATIONS

Recording Meters.—Esterline-Angus Co., Indianapolis. Bulletin showing the application and results of a graphic wattmeter in maintaining a continuous check on the performance of a concrete-mixing plant and another showing the value of recording the waste of electric current in a building.

Grinding Wheels.—Norton Co., Worcester, Mass. Description of care and safe use of grinding wheels in the August issue of "Grits and Grinds," the house organ of the Norton Co.

Pig Iron.—Bedevoise-Anderson Co., Inc., 114 Liberty Street, 40-page booklet compiled to include information of interest to the foundryman. Paragraphs are devoted to the effect of the various elements in cast iron and pages are devoted to helpful text and tables of weights and measures. Several pages are given to the analysis of various kinds of coke sold by the company and also the various brands of pig iron handled. Brands of charcoal pig iron, ferromanganese, ferrosilicon are also mentioned together with their uses. Various brands of coal, iron and steel scrap and mica schist are included. Several pages are devoted to tables, formulas and other data pertinent to foundry processes.

Steel Truck Cabs.—International Motor Co., 25 Broadway, New York. Special booklet shows detail photographs of Mack AC, year round motor truck cabs; also description explaining construction and adjustable features for varying weather. Size 9 x 10 in., 10 pages.

Special Sheet Metal Work.—Canton Art Metal Co., Canton, Ohio. Special catalog describes and illustrates the wide scope of uses for sheet metal products. Specifications are given together with photographs showing equipment in use. Size 6 x 10 in., 32 pages.

Pumps.—Goulds Mfg. Co., Seneca Falls, N. Y., 1922 supplement to catalog K shows the types of pumps the company concentrates on in its movement toward standardization. It includes specifications on hand, power and sprayer pumps, and gives a complete list of repair parts. Size 7 x 10 in., 97 pages. Also bulletin 123, devoted to the adaptations and special tests of Gould steam turbine driven centrifugal pumps. Size 8 x 10 in., 16 pages.

Steel Water Tanks.—Chicago Bridge & Iron Works, 2121 Old Colony Building, Chicago; and Horton Steel Works, Ltd., 232 Janet Street, Bridgeburg, Ont. Quarterly bulletin, The Water Tower, discussing problems in water storage and the manner of solving them. It is generously illustrated to show the varying types of tanks and how they may be utilized for advertising purposes.

Centrifugal Pumps.—Dayton-Dowd Co., Quincy, Ill. Bulletin 248, showing in illustrations and detailed descriptions the construction and operation of the type CSU Multi-stage pumps. Data are given on various efficiency tests. Suction lift curves are plotted for use after installation. Size 9 x 11 in., 20 pages.

Electric Motors.—B. F. Sturtevant Co., Hyde Park, Boston. Circular of 4 pages illustrating A-C and D-C motors of 1-20 to 800 hp. in size.

Semi-Steel Grate Bars.—A 4-page bulletin issued by the Thomas Grate Bar Co., Birmingham, Ala., discusses the superiority of this iron for this purpose.

Automotive Service Equipment.—Jacobs Mfg. Co., Hartford, Conn. Booklet published for general distribution, printed in an attractive, readable style to promote a general appreciation of the importance of adequate shop equipment among service stations and repair shops. The products mentioned are not those of any specific make, as the purpose of the booklet is to suggest ways of improving practice.

High Speed Steel.—Firth-Sterling Steel Co., McKeesport, Pa. Booklet of 44 pages, 9¼ x 4 in., a part of the company's plan to issue separate books on all units of its field; tells the story of blue chip high speed steel. It explains the merits peculiar to steel which has undergone a special heat treatment, emphasizing "red and cold hardness," and reduced distortion and shrinkage. A brief account of the heat treatment tells of the variations made for different machines and tools. The barium chloride process, undergone in treating small tools, is explained separately. Other books ready for distribution are: the C. Y. W. Choice Steel Book, S-less Steel Book and Special Steel Book.

Boring, Drilling and Milling Machine.—Pawling & Harnischfeger Co., Milwaukee. Bulletin No. 3-T, featuring a new table type horizontal boring, drilling and milling machine, and giving specifications describing the features of construction, of operation and scope of work which the machine is designed to do, with detailed illustrations calculated to give all the information necessary for the intelligent selection of the machine.

Induction Motors.—Reynolds Electric Co., 2650 West Congress Street, Chicago. Bulletin 204 giving specifications, description and illustrations of type B, split-phase, A-C, induction motors.

Gear Cutting Machine.—Newark Gear Cutting Machine Co., 69 Prospect Street, Newark, N. J. Catalog No. 4 of 25 pages, 9 x 6 in., giving detailed description of the workmanship and design of No. 2-B automatic spur and bevel gear cutting machine; also specifications and illustration. Several pages give examples of its usefulness by pictures and footnotes. One section tabulates cutters to assist in selecting, and also gives a table of tooth parts.

Pulverized Fuel Equipment.—Quigley Fuel Systems, Inc., 26 Cortlandt Street, New York. Bulletin A, of 4 pages, 12 x 8 in., shows a lay-out of a typical coal milling plant and explains briefly the method of fuel distribution and control. Some of the appliances are also described and illustrated in detail. Dust-tight features are emphasized, and by diagram the equipment is shown as applied to a water tube boiler.

Boiler Tube Corrosion.—National Tube Co., Pittsburgh. Fourth edition of the National Bulletin, discussing boiler tube corrosion from three angles: locomotive, stationary and marine service. A dissertation on each type of problem by recognized authorities comprises most of the 25 pages. Results of research, together with important data, are also given. Special articles appear on alkalinity, water purification. scale accumulation and preventive measures to take against corroding elements.

Oil Drilling.—Sullivan Machinery Co., Peoples Gas Building, Chicago. Bulletin 69-O, explaining the processes and merits of diamond drilling. It also gives a detailed account of modern prospecting, tracing the development of methods in structure testing, production drilling, etc. Size, 40 pages, 8 x 6 in.

Coating Metals.—Metals Coating Co. of America, 495 North Third Street, Philadelphia. Illustrated pamphlet of 18 pages, 12 x 10 in., showing results obtained from the Schoop metal spraying process in protecting against chemical action, atmospheric corrosion and mechanical erosion, or against high temperatures. It also explains the use of this process for adding dimension or weight, and for electrical conduction through simultaneous melting, atomizing and impacting on a surface. The mass coating machine for treating small pieces in bulk is of special interest.

Electric Motors.—Ohio Electric & Controller Co., Cleveland. Bulletin 203, 8 pages, 8½ x 11 in., illustrates and describes ball-bearing motors from ⅛ to 1-3 hp. A. C. induction motors, one, two or three phase, 25 to 60 cycle; also D. C. motors, 32 to 250 volts, for application to domestic appliances, pumps and devices operated from lighting circuits. Details are shown in dimensional drawings.

Sprockets, Chucks, Tapers.—Collis Co., Clinton, Iowa. Catalog No. 10, of 19 pages, 6 x 9 in., describes and illustrates drill sleeves and sockets, lathe bushings and centers, chucks, arbors and special tools. Dimensional drawings of tapers and ordering lists are given.

Steel Windows.—David Lupton's Sons Co., Philadelphia. Catalog 110, freely illustrated and described on finished paper, gives detailed information on planning as well as supplying homes or factories with steel sash and related products. Diagrams and illustrations show working features and relative position for good ventilation. Building suggestions and tabulated data are given. Size, 10 x 12 in., 71 pages.

Conveying Systems.—Link Belt Co., Seventeenth and Western Avenue, Chicago. Book No. 490, 34 pages, 9 x 5 in., suggests conveying devices as particularly adapted to foundry service—conveyors for coal, coke or pig iron, for molds, cores, castings and refuse. Cranes, portable loaders, hoppers, bin gates and mixers in vivid illustration show where many economies have been effected by introducing mechanical conveying. The Rapp revivifier for molding sand and other Link-belt labor-saving machinery is shown in operation by diagrams.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

Bars:	
Refined iron bars, base price	2.94c.
Swedish bars, base price	7.00c.
Soft steel bars, base price	2.94c.
Hoops, base price	4.29c.
Bands, base price	3.74c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	3.04c.
Channels, angles and tees under 3 in. x ¼ in., base	2.94c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	2.94c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.14c.
Toe-calk, ½ x ⅜ in. and larger	4.00c.
Cold-rolled strip, soft and quarter hard	6.75c. to 7.25c.
Open-hearth spring steel	4.50c. to 7.00c.
Shafting and Screw Stock:	
Rounds	3.90c.
Squares, flats and hex	4.40c.
Standard cast steel, base price	15.00c.
Extra cast steel	18.00c.
Special cast steel	23.00c.

Tank Plates—Steel

¼ in. and heavier	3.04c.

Sheets

Blue Annealed

	Per Lb.
No. 10	4.04c. to 4.19c.
No. 12	4.09c. to 4.24c.
No. 14	4.14c. to 4.29c.
No. 16	4.24c. to 4.39c.

Box Annealed—Black

	Soft Steel C. R., One Pass, Per Lb.	Blued Stove Pipe Sheet, Per Lb.
Nos. 18 to 20	4.30c. to 4.70c.	.....
Nos. 22 and 2	4.35c. to 4.75c.	5.00c.
No. 26	4.40c. to 4.80c.	5.05c.
No. 28	4.50c. to 4.90c.	5.15c.
No. 30	4.75c. to 5.15c.	.....

No. 28 and lighter, 36 in. wide, 10c. higher

Galvanized

	Per Lb.
No. 14	4.60c. to 5.00c.
No. 16	4.75c. to 5.15c.
Nos. 18 and 20	4.90c. to 5.30c.
Nos. 22 and 24	5.05c. to 5.45c.
No. 26	5.20c. to 5.60c.
No. 27	5.35c. to 5.75c.
No. 28	5.50c. to 5.90c.
No. 30	6.00c. to 6.40c.

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
⅛ in. Butt	—53	—38	¾ in. Butt	—16	+2
¼ in. Butt	—58	—45	1½ in. Butt	—19	—1
1-3 in. Butt	—60	—47	2 in. Lap	—13	+4
2½-6 in. Lap	—57	—44	2½-6 in. Lap	—16	+1
7-8 in. Lap	—53	—30	7-12 in. Lap	— 8	+8
9-12 in. Lap	—49	—30			

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	4.00c. to 4.25c.
Annealed soft	4.00c. to 4.25c.
Galvanized annealed	4.65c. to 4.90c.
Coppered basic	4.65c. to 4.90c.
Tinned soft Bessemer	5.65c. to 5.90c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	19¼c. to 20¼c.
High brass wire	20¼c. to 20¾c.
Brass rod	16¾c. to 17¾c.
Brass tube, brazed	26¼c. to 27¼c.
Brass tube, seamless	23 c. to 23½c.
Copper tube, seamless	25¾c. to 26 c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 22¾c. to 23¾c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14-20	
	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	Primes	Wasters
			80 lb.	$6.05	$5.80
			90 lb.	6.15	5.90
			100 lb.	6.25	6.00
IC	$10.00	$8.50	IC	6.40	6.15
IX	11.50	10.00	IX	7.40	7.15
IXX	13.00	11.25	IXX	8.40	8.15
IXXX	14.25	12.50	IXXX	9.40	9.15
IXXXX	16.00	14.00	IXXXX	10.40	10.15

Terne Plates

8-lb. coating, 14 x 20

100 lb.	$7.00
IC	7.25
IX	7.50
Fire door stock	9.00

Tin

Straits, pig	36c.
Bar	43c. to 47c.

Copper

Lake ingot	15¼c.
Electrolytic	15 c.
Casting	14¾c.

Spelter and Sheet Zinc

Western spelter	8½c.
Sheet zinc, No. 9 base, casks	9¼c. open 9¾c.

Lead and Solder*

American pig lead	7c. to 8c.
Bar lead	8¼c. to 9c.
Solder, ½ and ½ guaranteed	25c.
No. 1 solder	23½c.
Refined solder	20¼c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	75c.
Commercial grade, per lb.	35c.
Grade D, per lb.	25c.

Antimony

Asiatic	8c. to 9c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	25c. to 27c.

Old Metals

The market continues firm but business is quiet, with the exception of lead, which is active. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	11.75
Copper, heavy wire	11.25
Copper, light and bottoms	9.25
Brass, heavy	6.50
Brass, light	5.50
Heavy machine composition	8.50
No. 1 yellow brass turnings	6.75
No. 1 red brass or composition turnings	8.00
Lead, heavy	4.75
Lead, tea	3.75
Zinc	3.50

Flames Against the Night

You who know or have seen the flame of the mills at night-time, must have marveled also at the prodigious amount of labor and materials necessary to feed the gluttonous maws of these monsters.

The men in charge realize how great is the task of supplying materials, particularly coke and coal. That is why so many have turned this problem over to International. With our vast resources and organization, we can assure deliveries of every grade of coal and coke, irrespective of quantity or location.

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Every contract placed with LINDE helps to secure to oxygen users the country over the benefits in price and service accruing from greater volume.

The eighty LINDE Plants and Warehouses now in operation are convincing proof of the soundness of this principle.

A LINDE contract is an insurance policy—it insures a perfect product and a perfect service at an exceptionally favorable price.

No oxygen user, large or small, should close an arrangement for oxygen supply without first securing 1922 prices from the nearest LINDE District Sales Office.

[Nation-wide chain of 30 plants and 50 warehouses]

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Carbide and Carbon Building, 30 East 42nd Street, New York

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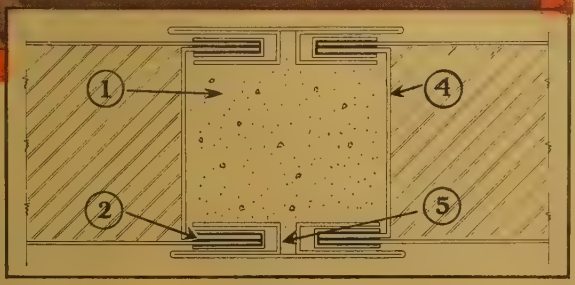

MAIN illustration shows a battery of Swartwout Oil and Electric Ovens of the typical rack type. Diagram at the right explained in text covers the famous Swartwout Joint that permits automatically increasing number of ovens at less cost and also avoids heat loss and other difficulties.

"— at much less cost than the first"

SWARTWOUT Industrial Ovens are Sectional. Any number of additional units may be added at any time. Adding more units to your battery may be accomplished at much less cost per unit than the first oven—a valuable feature of Swartwout design.

Note carefully the exclusive Swartwout Joint. It contains the five requirements for a good joint, i. e., insulation efficiency, elimination of through metal and bolts, simplicity in assembly, strength, rigidity, and expansion and contraction allowance.

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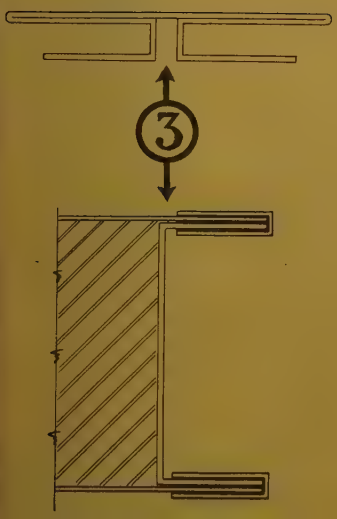

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